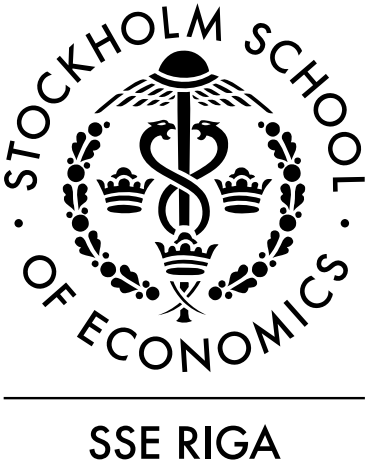

Bachelor Thesis

Universal Basic Income: A step towards equality or government's insolvency? The case of Latvia.

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Abstract

In recent years, there has been little progress in tackling income inequality and poverty across Europe. Alarmingly, Latvia ranks high among the OECD countries in both income inequality and poverty. A situation which in the long run can leave a detrimental effect on the economic growth and social conditions. Furthermore, recent reforms to the taxing and redistributive policies have shown little progress in addressing these issues, which calls for proposals of alternative remedies. In this study, we employ EUROMOD microsimulation model with anonymized microdata from the EU-SILC survey for Latvia to investigate if universal basic income could be a potential remedy. Our main findings suggest that the most effective scenarios in terms of reducing income inequality and poverty are also the most expensive ones. Nevertheless, there are certain properties of UBI calibration that appear to improve its effectiveness without inducing high costs, particularly including pensioners in the recipient list.

Keywords: universal basic income, EUROMOD, income inequality, poverty, redistribution

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1. Introduction

Previous empirical research highlights the negative effects of high-income inequality and poverty. For example, Aghion, Caroli, and García-Peñalosa (1999) show that greater income inequality and higher poverty leads to lower economic growth. In turn, Thorbecke and Charumilind (2002) find that higher income inequality and poverty is associated with lower educational attainment, higher crime rates, and lower access to healthcare. These negative effects give a reason for governments and international organizations to take action in eradicating poverty and income inequality (Hanna & Olken, 2018). Despite the efforts, the World Inequality Report shows an increasing trend in global income inequality (Alverado, Chancel, Piketty, Saez, & Zucman, 2018). Alarmingly, Latvia ranks high among the OECD countries in both income inequality (8^{th}) and poverty (5^{th}) (see appendices A and B). Furthermore, recent reforms to the taxing and redistributive policies have shown little progress in addressing these issues (European Commission, 2018), which calls for proposals of alternative remedies.

Universal basic income (UBI) has recently gained its popularity on the global stage as a theoretical remedy for fighting inequality and poverty. The concept of UBI implies a lump sum payment by the government to all members of the community, regardless of their age, employment or social status. In fact, some countries have already put the theoretical concept to test. This year, Finland is ending its UBI field experiment, in which the state provided a basic income for 2000 unemployed citizens (Yle News, 2018). Although the success of the experiment is still to be assessed, similar pilot projects have already been proposed in Switzerland and the Netherlands (Laurinavičius & Laurinavičius, 2016).

In the case of Latvia, discussions regarding the potential implementation of UBI has raised highly polarized opinions. However, the arguments on both sides are rarely based on empirical evidence. In fact, to the best of our knowledge, there has been no quantitative research on the potential implications of implementing UBI in the case of Latvia. As the concept is relatively new to the economic debate in Latvia, neither the expected impact on income inequality and poverty nor the attributed costs have yet been assessed. Therefore, we propose the following research questions: **1) How would the implementation of UBI affect income inequality and poverty in the case of Latvia?**; **2) What are the fiscal costs of such measures?**

The research attempts to fill the gap in the existing literature of UBI, as well as add to the policy debate, by providing a case study for Latvia. The study employs EUROMOD

microsimulation model with anonymized microdata from the EU-SILC survey to investigate if UBI could act as a potential remedy for income inequality and poverty in Latvia. It tests UBI for its effectiveness as well as feasibility from the fiscal policy perspective. The novelty of the work comes with a fact that it looks deeper than theoretical assessments of income redistribution and provides a measurable change in income inequality and poverty in the case of Latvia.

Our quantitative analysis is based on simulated scenarios. To test a large set of different scenarios of UBI we change the existing tax and benefit system. This approach provides simulated outcomes of each scenario encompassing the variables of our interest: changes in income inequality and poverty measures as well as fiscal costs. Scenarios represent different ways how UBI could replace or add to the existing tax and benefit policies. We do this by changing the amount of UBI payments for different age groups, taxation principles of UBI, and choosing whether to abolish or complement the existing social benefits.

Our main findings suggest a rather strong relationship between the effectiveness of UBI in terms of reducing income inequality and poverty and its fiscal costs. Hence, even though the proposed scenarios prove themselves to be effective in tackling income inequality and poverty, they also come with huge budget deficits, which cannot be compensated by changes in the state benefit system alone. Funding a somewhat effective UBI policy, which would bring income inequality in Latvia to the average level of the OECD, takes at least 6% of annual GDP. A budget-neutral policy meanwhile would require a 35% increase in income tax rates, and although proving itself to be no less effective, might lead to other negative economic consequences.

The paper is structured as follows. The first section reviews the existing literature and identifies the economic and social costs that income inequality and poverty impose on a country. The review further analyses the effectiveness of the most conventional methods for fighting income inequality and poverty, such as taxation and social benefits, and introduces UBI as an alternative remedy. Next section gives a detailed explanation of the methodology used in the study and defines the scenarios which later guide the simulation process. The result section presents an analysis of the performed models weighing their effect on income inequality and poverty measures against the fiscal costs. The discussion section explains the significance of the research findings linking them to the literature and the ongoing policy debate. The last section concludes the research and draws a clearer picture of UBI prospects in Latvia as well as the next steps needed to be taken in further research.

2. Literature review

2.1. Income inequality and poverty: economic costs and potential remedies

In 2015, income inequality reached its highest point in OECD countries over the last 30 years (OECD, n.d.a). This is a growing concern for governments due to the negative effects income inequality and poverty exert on the economy, society and political stability (Atkinson, Leventi, Nolan, Sutherland, & Tasseva, 2017). These negative consequences have been highlighted by a large body of literature. For example, Persson and Tabellini (1994) show that in a sample of developed economies over a period from 1830 to 1985 higher income inequality is associated with lower economic growth. Aghion et al. (1999) find several channels through which income inequality affects economic growth. First, it induces greater output volatility, which, if persistent over the years, leads to lower long-term economic growth. Second, it reduces investment opportunities, and third, it leads to lower credit market activity. Additionally, from a social perspective, income inequality is linked to a lower level of happiness in a society, especially in European countries (Alesina, Di Tella, & MacCulloch, 2004).

High rates of poverty have a detrimental effect on society in terms of economic costs. For example, higher risk of poverty is shown to result in worse health conditions (Ngoma & Mayimbo, 2017), lower educational attainment (Ferguson, Bovaird, & Mueller, 2007) and, as a consequence, lower economic growth (Perry, Arias, Lopez, Maloney, & Serven, 2006). Furthermore, poverty might also have an indirect negative effect on the economy's capacity to innovate, since the government faces tradeoffs in terms of budget expenditure allocation between tackling poverty and fostering innovations (Hall & Howell-Moroney, 2012).

Due to the negative effects on the economy, governments across the world have implemented different ways to tackle both income inequality and poverty. These include income tax regulation, social benefit programs and minimum wage regulation. A relatively recent addition to the list of remedies is the UBI.

Previous evidence shows that tax policies and social transfers leave a considerable impact on income inequality (Biswas, Chakraborty, & Hai, 2017). Pisu (2012) compares Gini indices for gross and net income for OECD countries and concludes that during the 2000s taxes and transfers on average reduced the income inequality by 25%. The effect on reducing poverty rates is even higher, marking a 55% reduction (Pisu, 2012). It is important to note that in OECD

countries tax policies only contribute 1/3 of the redistributive impact, while the lion's share is attributed to social transfers. The only exception is the US, where both taxes and social transfers have an equal impact on tackling income inequality (Joumard, Pisu, & Bloch, 2012). Previous evidence also suggests that redistributive properties of a tax system depend on its progressivity. A cross-country analysis of EU-15 countries suggests that countries with lower income inequality have higher tax progressivity (Moene & Wallerstein, 2001). Also, Perotti (1996) shows that tax progressivity leaves a positive effect on income equalization which, in turn, enhances economic growth. Similarly, Cooper, Lutz, & Palumbo (2015) note that progressive taxes have reduced income inequality in the US over a period from 1984 to 2011.

Nevertheless, tax policies which are designed for redistributive purposes might have undesirable side-effects. These include "unemployment trap" which prevails when the unemployment benefits exceed the after-tax income from employment, and unemployed individuals have low incentive to work (Saint-Paul, 1995). Deteriorating work incentives lead to elevated levels of unemployment which, in turn, might have a negative effect on income inequality and poverty rates (both are intensified in times of high unemployment and underemployment; see, Dimick, 2017). Furthermore, the unemployment trap has negative implications on fiscal sustainability (Kay, 1984).

Another way to tackle income inequality and poverty is social benefits.[1] Since social benefits can be attributed to certain groups, they have a direct impact on income inequality and poverty (Llamas, Arrar, & Huesca, 2017). For instance, the Czech Republic has achieved one of the lowest income inequality and poverty rates in Europe due to an effective social benefit system. The effect can be measured by comparing market income Gini coefficient (0.46) with disposable income Gini coefficient (0.247) (Janský, Kalíšková, & Münich, 2016). Urban (2008) suggests that public pensions are the main driver for reducing income inequality.

There have also been more unorthodox methods to reduce income inequality and poverty. For example, in Canada, a field experiment of minimum guaranteed income (mincome) took place from 1974 to 1979 (Simpson, Mason, & Godwin, 2017). Everyone with income that is lower than a threshold set by the state received an additional income transfer. The evidence on the effectiveness of the mincome is, however, inconsistent due to underdeveloped data collection methods at the time (Forget, 2011). Yet, the findings of Monti and Pellizzari (2010) suggest that

[1] In this study terms social benefits and social transfers are used interchangeably.

mincome in Italy would have similar effects as other benefit distribution policies that promote equality and have somewhat lower fiscal costs.

2.2. Universal basic income: empirical evidence

An alternative approach to the standard social benefit system is the universal basic income.[2] The fundamental difference between UBI and the regular social benefit system is that the latter is conditional and temporary (Groot, 1997). In contrast, UBI provides a safety net for every individual without any precondition (Van Parijs, 2004).

An extensive analysis in assessing potential pros and cons of UBI was conducted by Browne and Immervoll (2018). Using EUROMOD microsimulation model for Finland, France, Italy and United Kingdom they conclude that replacing existing income protection with simple UBI would require a substantial amount of additional tax revenue and that targeted social protection benefits are a more cost-efficient way to obtain a similar reduction in income inequality and poverty. Similarly, Torry (2017) using EUROMOD in the UK indicates that switching from the current tax and means-tested social benefit policy to UBI with the same government budget would make the low-income households significantly worse off. Similar results are obtained by Reed and Lansley (2016) who explore the potential effects of UBI in the UK using different scenarios in terms of UBI calibration and changes in current tax and social benefit systems. Majority of their simulations suggest that the introduction of UBI would not lead to better outcomes than the current system. Additionally, Greenstein (2017) states that in the case of the US an introduction of UBI would not only be unfeasible, but it would also increase inequality and poverty. Thus, we propose the following hypothesis:

H1o) If UBI is implemented in Latvia, then it will not have an effect on income inequality and poverty.

H1a) If UBI is implemented in Latvia, then it will increase income inequality and poverty.

H1b) If UBI is implemented in Latvia, then it will decrease income inequality and poverty.

There are, however, some studies that suggest that UBI might yield better results than the existing systems. For example, Stevens and Simpson (2017) described a model that combines UBI with a part of the existing social benefit system in Canada, 90% of which would be covered

[2] in other literature also called citizens' income, social dividend, basic living stipend, etc.

by the existing budget. Their findings suggest that such a model would reduce poverty by 29% and income inequality by 6.8%. Furthermore, one scenario by Reed and Lansley (2016) suggests that UBI accompanied by higher tax progressivity could potentially decrease income inequality and reduce child poverty. The fiscal costs of such a measure are somewhat high; the government expenditures increase by roughly 0.5% of GDP (Reed & Lansley, 2016). Nevertheless, an experiment in Canada that was supposed to be held for 3 years, starting in 2017, was cut short after a few months from the launch, proving to be fiscally unsustainable (BBC, 2018).

In Finland from 1984 till 2011 around 13 different UBI models have been proposed; however, none of them has proved to be effective and at the same time cost-neutral (Koistinen and Perkiö, 2014). [3] Also, the preliminary results from the most recent experiment in Finland (which completed at the end of 2018) do not show promising results. Although UBI has left a positive impact on health, ability to concentrate and stress tolerance, it has not contributed to tackling unemployment (Kangas, Jauhiainen, Simanainen, & Ylikännö, 2019). What is more, the costs of the experiment for the government amounted to 5000 euros per participant. Thus, the policy so far does not seem appealing to policymakers (Bershidsky, 2019).

Laurinavičius and Laurinavičius (2016) analysed the potential introduction of UBI in Lithuania. Their main findings were that Lithuania's economic situation, in theory, would be welcoming for a small amount of UBI. However, because of already high existing irreplaceable benefits a fully realised UBI would be too costly for the government to implement and it would not have a notable effect on the income inequality. In fact, the implementation of UBI in these circumstances could even leave a negative impact on the income inequality because the state budget and social insurance fund resources are not sufficient enough to provide both UBI, pensions and benefits. Therefore, even if a relatively small amount of UBI would be implemented, it could leave a large part of the society worse off. For the poorest part of the society, a small amount of UBI would not offset the existing benefits. It has been shown that, in the case of a strapped government, the implementation of UBI could even lead to deteriorating effects on income equality and the risk of poverty. In this regard, we will test the second hypothesis:

H2o) If UBI is implemented in Latvia, then it will have a neutral effect on the government budget.

[3] In depth analysis of successes and failures of all 13 models is available in Koistinen and Perkiö (2014).

H2a) If UBI is implemented in Latvia, then it will have a detrimental effect on the government budget.

H2b) If UBI is implemented in Latvia, then it will have a lucrative effect on the government budget.

Additionally, it seems that the implementation of UBI would release the burden of monitoring each benefit recipient and thus reduce the transaction costs in complex social security systems; however, it might not be the case. It is important to stress that UBI can only be granted to residents either on a national, regional, or local level. Hence, a certain amount of monitoring of the present residents who are eligible to receiving UBI would still take place (De Wispelaere & Stirton, 2013).

2.3. Discussions on implementing UBI in Latvia

From 2007 to 2016 income inequality in Latvia, measured by the Gini coefficient, decreased by 2.7 percentage points. However, it still remains high if compared to other OECD countries (see appendix A). Although labour income has been increasing on average by 8% each year since 2010, the income growth for poorest 10% of the society, mostly pensioners, has been more moderate (OECD, 2018). European Commission (2018) points out that progress in tackling income inequality and poverty has not been substantial and recent reforms to the tax legislation have shown negligible improvement.

This has given background for numerous debates and discussions on implementing UBI in Latvia (e.g. open debates during festival LAMPA 2018, a panel discussion at the Mill 2018). The discussions have revolved around issues of unemployment, unequal income distribution, poverty, the welfare of the society and in some cases also philosophical topics such as "*losing one's identity*" (Satori, 2018). The outcome of these debates has mostly prompted against the implementation of UBI. However, none of the arguments supporting this opinion has been based on any kind of empirical validation (Satori, 2018). Therefore, it is crucial to provide a simulation of the possible outcomes to develop a solid understanding of the problem.

3. Methodology

3.1. EUROMOD and EU-SILC microdata

The research employs the European Union population-based tax-benefit microsimulation model (EUROMOD) to run scenarios on Latvian household data. For more than two decades EUROMOD has been a widely-used tool for measuring effects of new government policies and tax reforms, helping to evaluate their viability and feasibility. Simulations in previous studies range from changing family and housing benefits to changing tax regulation and, more recently, also UBI (Browne & Immervoll, 2018; Torry, 2017).

EUROMOD connects household micro-data from the national European Survey of Income and Living Conditions (EU-SILC) with the national tax code and benefits system to estimate benefit entitlements, tax liabilities and income distribution for a representative sample of the population (Sutherland & Figari, 2013). We use anonymized microdata for Latvia from EU-SILC survey for 2015 which was obtained from the Central Statistics Bureau of Latvia. The dataset is then adjusted to fit the conditions of 2018 by using built-in uprating indices. EU-SILC is nationally representative dataset which contains detailed information on the income, poverty and living conditions of surveyed households (Eurostat, n.d.). The dataset covers both household and individual level data on income, employment status, social benefits, age, marital status, number of children, education level, health assessment, working hours, and other variables. The dataset is composed of 6042 households and 13833 individuals.

3.2. Construction of scenarios

UBI cannot be generalized into one definite form. It depends on the political and economic setting and may vary significantly from country to country. To take this into account, we draw on previous literature (among many other see Browne & Immervoll, 2018; Laurinavičius & Laurinavičius, 2016; Reed & Lansley, 2016) and distinguishes various scenarios for further analysis. The outcomes of these scenarios are then compared to the baseline scenario which corresponds to the policies that were in place in 2018. Different UBI scenarios are summarized in table 1.

Table 1. Summary of UBI microsimulation scenarios and their properties

Are existing social benefits abolished?	Is UBI taxed?	UBI amount, (EUR)	UBI for old-age pensioners, (EUR)	Scenario #
Not abolished	Not taxed	160 (80 for children)	80	Scenario (1)
			0	Scenario (2)
		193 (96.5 for children)	96.5	Scenario (3)
			0	Scenario (4)
		367 (183.5 for children)	183.5	Scenario (5)
			0	Scenario (6)
	Taxed	160 (80 for children)	80	Scenario (7)
			0	Scenario (8)
		193 (96.5 for children)	96.5	Scenario (9)
			0	Scenario (10)
		367 (183.5 for children)	183.5	Scenario (11)
			0	Scenario (12)
Abolished	Not taxed	160 (80 for children)	80	Scenario (13)
			0	Scenario (14)
		193 (96.5 for children)	96.5	Scenario (15)
			0	Scenario (16)
		367 (183.5 for children)	183.5	Scenario (17)
			0	Scenario (18)
	Taxed	160 (80 for children)	80	Scenario (19)
			0	Scenario (20)
		193 (96.5 for children)	96.5	Scenario (21)
			0	Scenario (22)
		367 (183.5 for children)	183.5	Scenario (23)
			0	Scenario (24)

Note: The table presents 24 different scenarios. The first column indicates if the social benefit system is either abolished or retained. The second column indicates if the UBI is taxable or not. In the third column, scenarios are divided into 3 groups depending on the UBI amount (the respective amount of children UBI being 50% of the general UBI). The fourth column separates scenarios according to the UBI amount paid to old-age-pensioners. All scenarios foresee complete abolishment of tax allowances.

The first step (column 1) is to determine to what extent UBI replaces existing social benefit system. We first consider UBI to be complementary to the existing social benefit system. As an alternative, we consider abolishing all social benefits (with the exemption of old-age pensions). These include all social security benefits like unemployment benefit, sickness benefit, parental benefit and others, which compensate for the loss of working abilities, now covered by UBI. Moreover, following the example of previous studies, most of the state social benefits are

abolished as well. Regularly paid benefits such as family or guardian benefits, invalidity benefit and others are dismissed, while one-time benefits, including childbirth, adoption and funeral benefits are retained due to their specificity and sudden additional expenses which UBI cannot cover. Municipal social benefits are mostly maintained due to their one-time occurrence (birth, death and other benefits), except for guaranteed minimum income (GMI) benefit which is abolished.

Next step is to consider the taxation of UBI. In a similar manner to Browne and Immervoll (2018), we consider two alternative scenarios: (a) one of which fully taxes UBI like other income and (b) one which treats UBI as a non-taxable income. Considering the progressive tax system of Latvia, taxing UBI ensures that it is worth less to those who earn more. At the same time, it makes UBI more affordable by providing the state with additional tax revenue.

The next choice is to determine the amount of UBI for a working age (18-63 years) individual. We follow Laurinavičius and Laurinavičius (2016) example and set the amount of UBI equal to Finland's in relative terms. This is achieved by using the average monthly salary and GDP per capita as weights. The calculation of the UBI amounts for Latvia is summarized in table 2.

Table 2. Calculation of UBI amount for working-age individual

	GDP per capita, USD	Average gross salary, EUR	UBI per month, EUR	
Finland	45703	3439	560	560
Latvia	15594	983	193	160
Ratio	2.9	3.5	2.9	3.5

Sources: Authors calculations using data from The World Bank (n.d.), Trading Economics (n.d.), and Central Statistical Bureau (2018a).

Given that in 2017 the average wage and GDP per capita in Finland was approximately 3 times higher than in Latvia (2.9 and 3.5), we assume such differential also for the UBI amount. Taking Finland's UBI of EUR 560 as the base amount (Yle News, 2018), this gives us a range of possible UBI in Latvia from 160 to 193 euros. Both figures are above the upper bound of the GMI level, which amounts to 128 euros per month (Reirs, 2012). However, neither of them reaches close to the government-estimated poverty threshold of 367 euros per month, taken as 60% from the disposable income median (Central Statistical Bureau, 2018b). Considering the

eradication of poverty as one of the targets of UBI policy, we thus propose 367 euros as a third UBI amount used in the study.

As suggested by Browne and Immervoll (2018) we adjust the UBI amount for children to take into account the fact that they are still mostly living with their parents. In all of our scenarios, UBI for children is set to 50% of the adults in correspondence to the children GMI in Riga municipality which is set at 50% of the upper boundary of 128 euros (Rīgas pašvaldība, n.d.).

In the case of old-age pensioners, we acknowledge that they already receive regular pension income and; therefore, we distinguish two scenarios. First, old-age pensioners receive the half amount of full UBI while keeping old-age pensions intact. Second, we exclude them from UBI recipients list completely. We believe completely abolishing old-age pensions and replacing them with UBI would be an unrealistic scenario from an economic and legal perspective.

Furthermore, we follow Browne and Immervoll's (2018) suggestion to abolish tax-free allowances in all proposed scenarios. As argued by Atkinson et al. (2017), the use of tax allowances becomes less convincing when all citizens receive a sufficient amount of income, which does not disappear when a person starts receiving income from employment. At the same time, this change raises incentives for work and helps escape the unemployment trap, opposing the critiques of UBI, by obliterating the fear of losing existing benefits and tax allowances, which often works as a reason for unemployed not to look for a job. The exception to the proposed abolishment is old-age pensioners whose non-taxable minimum income is retained in scenarios where they do not receive UBI.

Last, to grasp the scale of fiscal costs for each scenario, we consider two methods to offset the costs of UBI by changing the tax code. First, we do this by increasing the personal income tax and social insurance contribution rates to the extent that all measures combined are fiscally neutral (with the accuracy of 0.1% from the GDP). The alternative option is to finance UBI with a budget deficit.

3.3. Scenario analysis

We present summary statistics on income inequality, poverty rates and budgetary cost for each scenario. This allows us to evaluate the effectiveness and feasibility of each separate scenario.

The effectiveness of each scenario is defined as the extent to which the policy meets its goals. Therefore, the measures used are quantitative changes in Gini coefficient and S80/S20 ratio, changes in equivalised disposable income by income deciles, as well as changes in the risk of poverty for different age groups. Gini coefficient is chosen as the main measure for inequality due to its international recognition and convenience of comparison internationally. It is "based on the comparison of cumulative proportions of the population against cumulative proportions of income they receive, and it ranges between 0 in the case of perfect equality and 1 in the case of perfect inequality" (OECD, n.d.a). Other measures allow us to distinguish and quantify income groups that are the most affected both positively and negatively by the new policy.[4]

In turn, the feasibility of each scenario relates to the fiscal costs of implementing UBI. We calculate fiscal costs as the expenditure on the UBI payments, minus budgetary savings from the abolished benefits and increased tax revenue. The net cost is then respective to the GDP of Latvia as well as the annual state budget, stimulating the conclusions about the feasibility of such policies. Since EUROMOD is a stationary model, we focus only on the direct effects of UBI, ignoring potential indirect effects it might have e.g. in the form of changes in consumption.

[4] It must be noted that there are different types of measures for income inequality. Since we are interested in the effects of various redistributive policies, this research scrutinizes disposable income inequality. Therefore, we assume that market income inequality (before transfers and taxes) remains unchanged in contrast to disposable income inequality (after transfers and taxes). The latter more closely represents the actual economic wellbeing of people as well as accounts for taxes and transfers which are directly affected by the implementation of UBI.

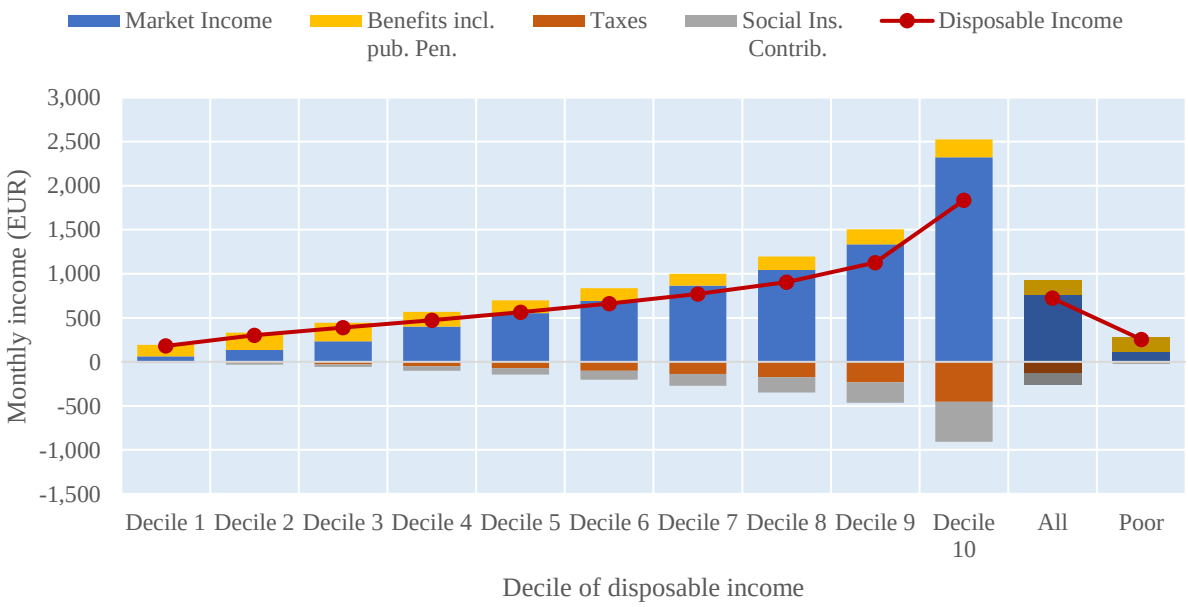
4. Main findings

4.1. Baseline scenario

We compare the outcome of each scenario to a baseline which represents the tax and benefits system that was in place in Latvia in 2018.[5]

Figure 1 reflects mean income for different disposable income deciles (1 being the poorest; 10 the richest) and a breakdown on how taxes and benefits contribute to disposable income. On average, mean equivalized market income is EUR 763 a month of which approximately a third is paid in taxes (income taxes and social security contributions reduce original market income by 15% and 11% respectively). This is partially offset by social benefits and pensions that provide additional income (on average 23.5% of the market income). Hence, the disposable income (EUR 720) is somewhat lower than the market income.

Figure 1. Mean equivalised income by decile groups and income components (2018)



Sources: EUROMOD, authors calculations.
Note: each decile represents 10% of the population which falls in the respective income level group, starting from the bottom decile 1. Each decile's mean market income is supplemented with benefits, including public pensions, and reduced by income taxes and social security contributions. Mean income of the whole population is denoted by "All" whereas "Poor" reflects the income of those falling under the poverty threshold (in this model, 367.58 euros a month).

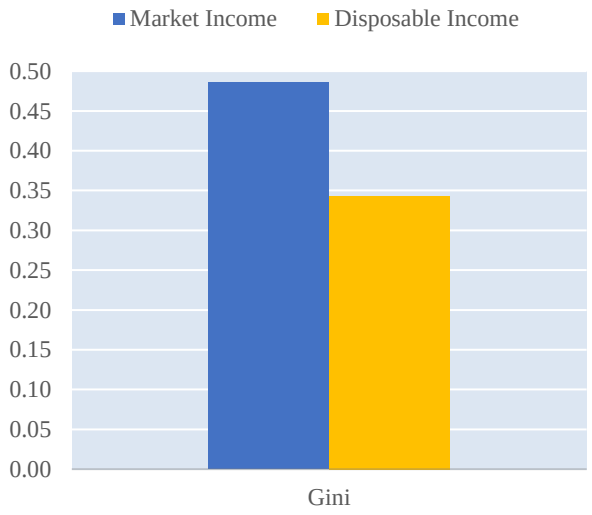
A different image appears when looking at the part of society below the poverty line: their disposable income is significantly larger than market income. While the absolute amount of

[5] This reflects the most recent tax and benefits calibration available in the EUROMOD.

benefits and public pensions fluctuates only marginally among different income deciles, the proportion of it raises as the income goes down. This shows how the social transfer system helps to reduce income inequality. Our estimates suggest that total market income inequality (before taxes and transfers) measured by the Gini coefficient was 0.486. However, the state tax and benefit systems help to reduce it by roughly 30% (see figure 2), since the Gini coefficient based on disposable income (after taxes and transfers) falls down to 0.343.

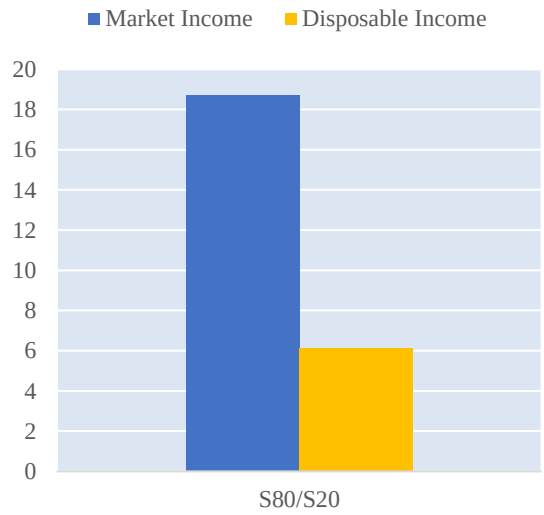
The extent of inequality is also presented by the S80/S20 ratio, which shows that mean disposable income of the richest 20% was 6.1 times higher than the one of the lowest 20% of the population. The bottom 20% of citizens contributed 6.7% to the total disposable income, as opposed to the top 20% who contributed 41.1%. Nevertheless, the disparity would have tripled without the current tax-benefit system (figure 3).

Figure 2. Gini index of market and disposable income (2018)



Sources: EUROMOD, authors' calculations.

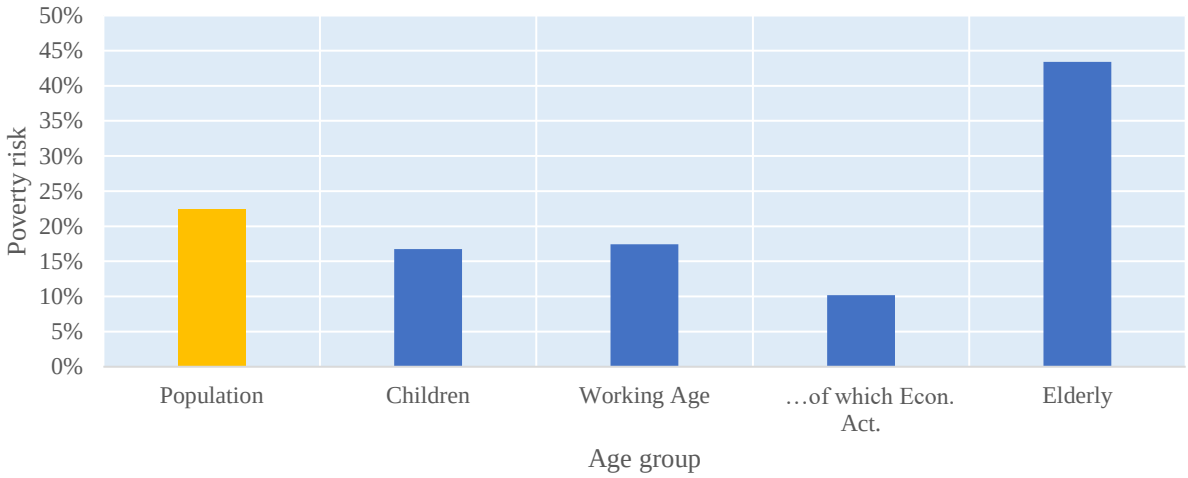
Figure 3. S80/S20 index of market and disposable income (2018)



Sources: EUROMOD, authors' calculations.

The risk of poverty, measured as a fraction of population falling under the threshold of poverty, reached 22.4%. In the case of elderly people (over 65 years), the rate is nearly twice as high, reaching 43.4% (see figure 4). Meanwhile, the intensity of poverty, measured as a mean shortfall to the poverty line, is 27%.

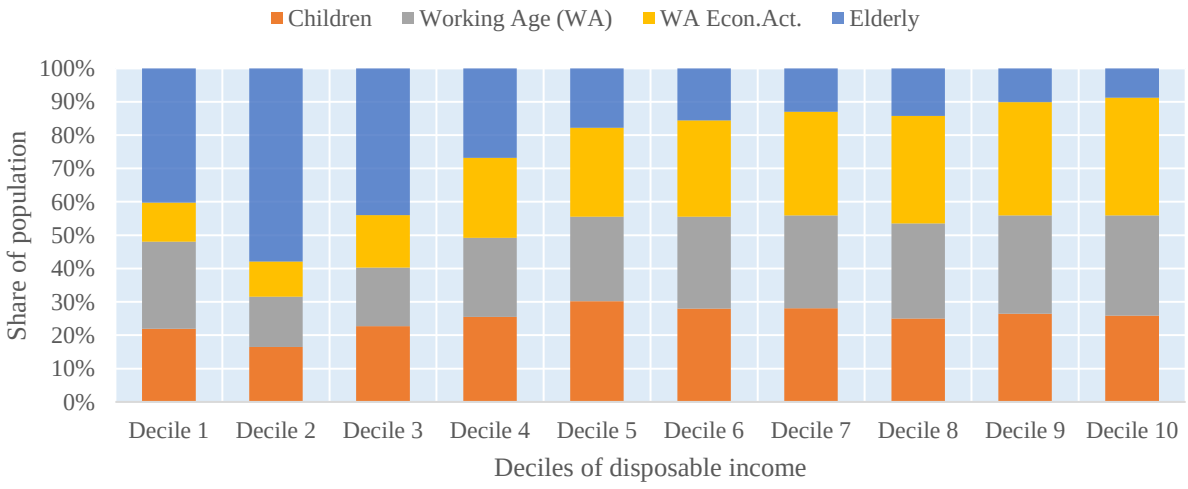
Figure 4. Poverty risk in Latvia (2018) by different population groups



Sources: EUROMOD, authors' calculations.
Note: Poverty rate (or risk) reflects the proportion of the population whose disposable income does not reach over the poverty line which is defined as 60% of the country-specific median disposable household income for one member, in our case, 367.58 euros a month.

Currently, elderly people are the part of society being the most in danger. 57% of all elderly fall in the 3 lowest income deciles (poorest 30% of society), while only 15% of economically active working age adults can associate themselves with these lowest deciles. As portrayed in figure 5, the proportions of each age group swap the roles when it comes to the deciles with the highest incomes.

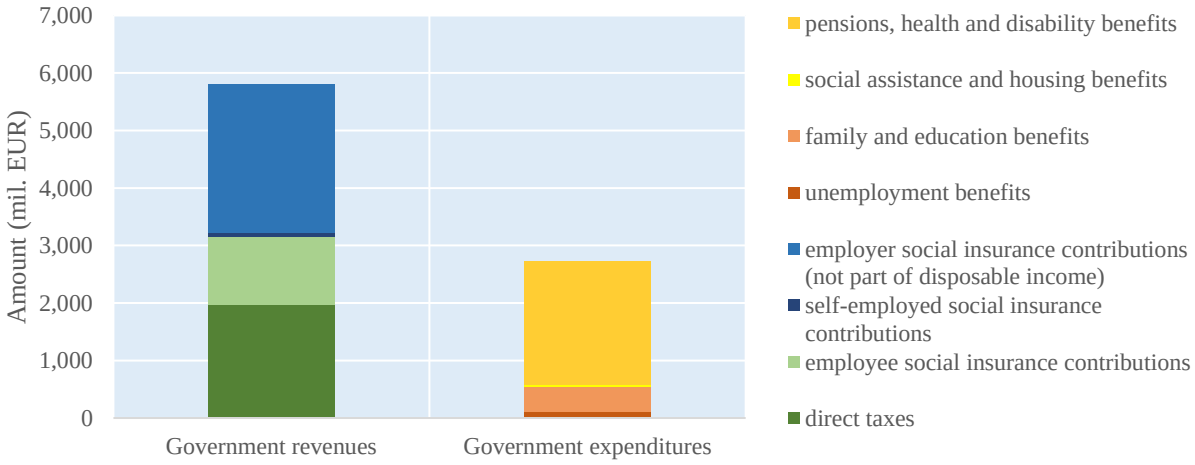
Figure 5. The share of population groups in each income decile (2018)



Sources: EUROMOD, authors' calculations.
Note: Each income decile is decomposed into 3 age groups, of which working age (WA) group is then cut further to economically active and inactive. The proportion of WA is increasing starting from decile 3 onwards, while the proportion of elderly is shrinking. The proportion of children fluctuates around 20-30% in each decile.

In 2018, government budget expenditures on social transfers amounted to 2.7 billion euros, of which roughly 75% or 2 billion were paid out in pensions (old-age, survivor, and disability). Also, 109 million were dedicated to unemployed and 428 million to families, leaving 193 million for other benefits (see figure 6).

Figure 6. Government expenditure on social benefits and revenue from direct taxes and social security contributions (2018)



Sources: EUROMOD, authors' calculations.
Note: Figure does not plot all expenditures and revenue items, but only those that are directly affected by the UBI scenarios.

On the revenue side of the government's budget, direct taxes and social income contributions generate approximately 5.8 billion euro. The largest source of revenue is employer social contributions (2.6 billion euros) and direct taxes (2 billion euros).

4.2. The effectiveness of UBI

The effects on poverty and inequality of each scenario are summarized in this section (detailed statistics available in table 3).

Our estimates suggest that on average the proposed policies reduce disposable income inequality by 4.9 pp. In fact, inequality, measured by the Gini coefficient, decreases in all the scenarios ranging from 0.247 (Scenario 5) to 0.325 (Scenario 20). Hence, all of the proposed policy scenarios seem to help in tackling income inequality. In scenarios where the old benefit system was completely substituted by UBI (namely, scenarios 13-24), the new policy managed to eradicate on average 38% of market income inequality. In contrast, the old tax and benefit system decreases it only by 29%.

Table 3. Effects of UBI scenarios on inequality and poverty (UBI reform 2018)

	ΔGini coefficient		ΔMean disp. income, (EUR)		ΔS80/ S20	ΔRate of poverty, (pp)				
	After taxes and pensions	Disposable income	All	Poor		All	Children	WA	Econ. act.	Elderly
Baseline	0.3615	0.3429	720.40	253.97	6.11	22.39	16.74	17.43	10.20	43.42
Scenario (1)	0.0239	-0.0457	137.89	115.96	-1.42	-11.05	-12.32	-10.68	-7.65	-11.0
Scenario (2)	0.0097	-0.0399	133.09	104.18	-1.16	-9.74	-12.35	-10.78	-7.66	-3.94
Scenario (3)	0.0239	-0.0558	178.42	149.58	-1.67	-13.18	-14.26	-12.30	-8.58	-14.91
Scenario (4)	0.0097	-0.0467	168.99	130.08	-1.29	-11.05	-14.21	-12.16	-8.54	-4.52
Scenario (5)	0.0239	-0.0957	392.17	327.01	-2.49	-21.25	-16.74	-16.90	-10.17	-39.24
Scenario (6)	0.0097	-0.0717	358.28	266.67	-1.61	-14.64	-16.56	-16.33	-10.07	-7.49
Scenario (7)	0.0471	-0.0351	98.06	83.42	-1.15	-8.35	-9.93	-8.37	-6.35	-6.73
Scenario (8)	0.0267	-0.0335	98.57	81.21	-1.04	-7.96	-10.01	-8.89	-6.51	-3.07
Scenario (9)	0.0523	-0.0442	130.34	110.26	-1.40	-10.60	-12.17	-10.23	-7.39	-10.23
Scenario (10)	0.0307	-0.0398	127.19	102.0	-1.17	-9.61	-12.26	-10.61	-7.49	-3.92
Scenario (11)	0.0828	-0.0819	300.52	252.14	-2.23	-18.57	-16.60	-16.12	-9.95	-28.18
Scenario (12)	0.0547	-0.0642	277.85	211.31	-1.57	-14.01	-16.50	-15.58	-9.77	-6.69
Scenario (13)	0.0325	-0.0331	79.53	84.04	-1.16	-7.69	-6.70	-7.46	-5.77	-9.37
Scenario (14)	0.0198	-0.0263	72.10	69.70	-0.88	-6.22	-6.66	-7.45	-5.67	-1.92
Scenario (15)	0.0325	-0.0449	120.03	117.53	-1.48	-10.27	-8.96	-9.64	-7.16	-13.50
Scenario (16)	0.0198	-0.0347	107.97	95.47	-1.06	-7.84	-8.72	-9.23	-6.96	-2.65
Scenario (17)	0.0325	-0.0903	333.78	294.92	-2.45	-20.82	-16.68	-16.32	-10.14	-38.96
Scenario (18)	0.0198	-0.0651	297.24	232.01	-1.56	-14.18	-16.53	-15.71	-10.04	-7.12
Scenario (19)	0.0568	-0.0208	39.78	51.72	-0.79	-3.97	-1.68	-4.39	-3.49	-4.88
Scenario (20)	0.0388	-0.0176	37.12	45.57	-0.64	-3.25	-1.61	-4.56	-3.55	-0.71
Scenario (21)	0.0622	-0.0314	72.02	78.37	-1.11	-7.12	-6.07	-6.95	-5.45	-8.66
Scenario (22)	0.0431	-0.0254	65.67	66.09	-0.85	-5.84	-5.95	-7.10	-5.39	-1.77
Scenario (23)	0.0942	-0.0747	242.17	220.05	-2.16	-17.75	-15.38	-15.27	-9.78	-27.80
Scenario (24)	0.0688	-0.0554	216.29	175.17	-1.45	-12.87	-15.09	-14.46	-9.58	-5.74

Sources: EUROMOD, table made by the authors.

Considering the stand-alone effect of the social benefit system (without pensions) by comparing Gini coefficient of personal income after pensions, social contributions and taxes to the one of disposable income, the highest magnitude of inequality reduction is shown by Scenario 23 (41%), while the lowest by Scenario 14 (17%). Thus, the new social benefit system proves itself to be more effective than the previous one which was able to reduce inequality only by 5%.

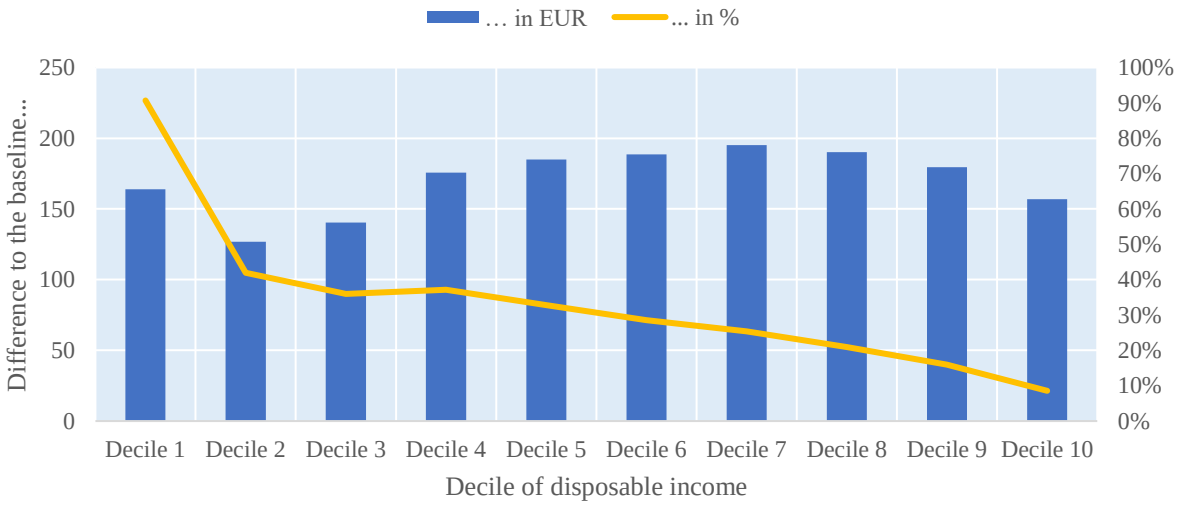
The amount of UBI supposedly is the main contributor to the reduction of Gini; the higher the amount, the more inequality is reduced. In cases when UBI is set at 367 monthly euros, the Gini coefficient is below 0.3 with no exception (scenarios 5, 6, 11, 12, 17, 18, 23, 24). Moreover, the effect is stronger when also elderly people receive UBI (scenarios 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23). In latter, an additional euro added to the monthly UBI amount received per person on average decreases inequality by 0.027 pp. In comparison, scenarios where elderly people receive 0 yield 0.018 pp effect per additional euro. However, the real effect of entitling elderly people to UBI is rather ambiguous, with different other policy premises the effect may

vary from 0.16 pp to 2.52 pp decrease in Gini coefficient. The effect of this entitlement is stronger when benefits are abolished and UBI is not taxed.

Regarding the remaining policies, we also gauge the stand-alone effect of benefit abolishment and UBI taxation by comparing similar scenarios with and without benefit abolishment or UBI taxation. Abolishing the existing benefit system raises income inequality by 1.12 pp on average with a range of 0.54 pp (scenarios 17 versus 5) to 1.59 pp (scenarios 20 versus 8). A similar effect of 1.05 pp increase on average is also yielded by the introduction of UBI taxation with a bit tighter range from 0.64 pp (scenarios 8 versus 2) to 1.57 pp (scenarios 23 versus 17). The strongest effects of taxation occur in scenarios when UBI is given to everyone marking a 1.29 pp increase.

Next, in figure 7 we break down inequality analysis to income deciles. Confirming the claims of early model adaptors Van Parijs (1992) and Atkinson et al. (2017), UBI in our model mostly addresses the poorest part of society, especially income decile 1 whose mean disposable income on average is almost doubled (91% increase compared to baseline scenario). Despite the fact that disposable income in absolute terms increased the most for deciles 6-8, the poorest part of the population is still winners in relative terms, which is the main contributor to the reduction of income inequality. The percentage increase of disposable income, nevertheless, drops by more than half already for decile 2 and keeps gradually decreasing until 9% for the richest 10% of the population.

Figure 7. Changes in mean equivalised income by decile groups (mean of 24 UBI models)

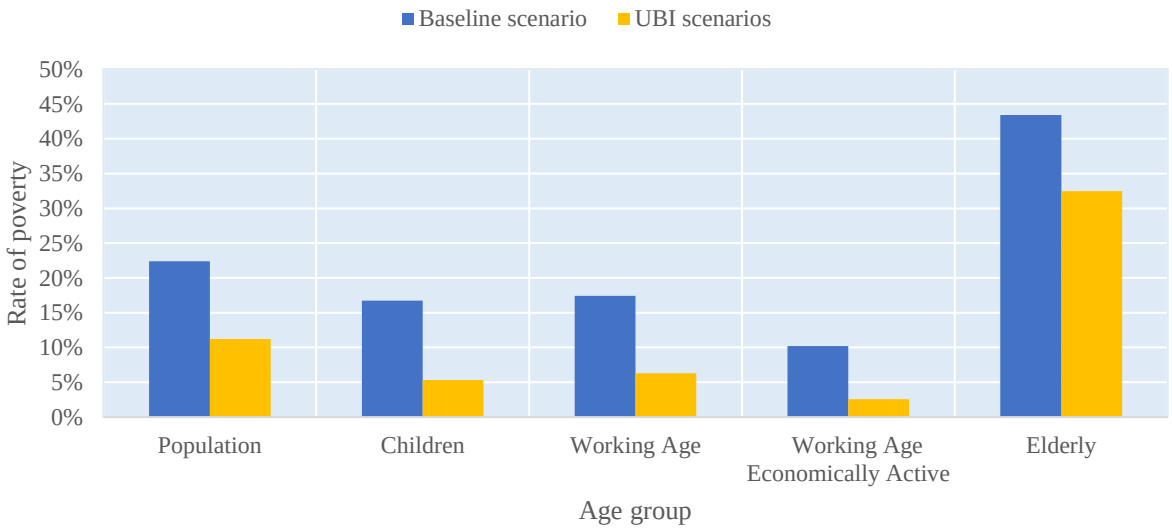


Sources: EUROMOD, authors calculations.

In scenarios 5 and 17, the mean disposable income for the lowest deciles increased the most, by 2.3 and 2.2 times respectively. Only 2 out of 24 scenarios (19 and 20) contained losers in decile 10; the mean income of this decile decreased by 0.35% and 0.34% respectively. The closure of the income gap for poor and rich is also indicated by the S80/S20 ratio which varies from 3.6 to 5.5 in different scenarios (in all cases lower than the baseline scenario).

Our simulations suggest that poverty on average is reduced by half, down to 11.2%. The same scenarios which turned out to be most effective in reducing income inequality are also the best performers in terms of tackling poverty. The lowest level of poverty 1.1% is yielded by Scenario 5 while the highest level of 19.1% is marked by Scenario 20. A crucial part of the reducing effect comes from elderly people who are significantly better off (see figure 8). However, the outcomes for the elderly are rather polarized. Difference between poverty rates of elderly in scenarios where the elderly are entitled to UBI and not entitled can reach as much as 31.8 pp (scenarios 17 versus 18). Disparities though become less significant with a smaller amount of UBI. Even though other age groups are somewhat immune to the entitlement of the elderly to UBI, they are still affected by the amount of UBI. Each additional euro to the monthly UBI amount on average has a 0.051 pp effect on total poverty rate reduction but the impact grows larger when the benefit system is abolished and UBI is taxed.

Figure 8. Poverty rates by different population groups (mean of 24 UBI models)



Sources: EUROMOD, authors calculations.
Note: Poverty rate or risk of poverty reflects the proportion of the population whose disposable income does not reach over the poverty line which is defined as 60% of the country-specific median disposable household income for one member, in our case, 367.58 euros a month.

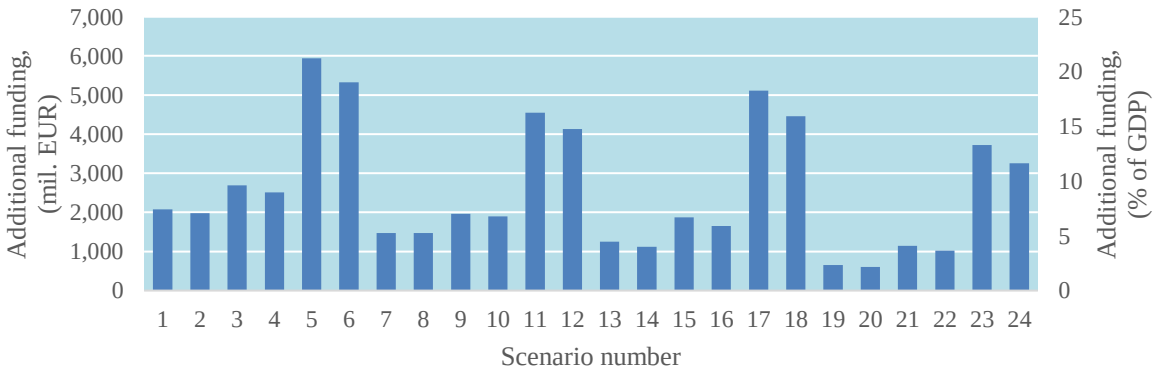
In scenarios in which the existing state benefit system is abolished, the rate of poverty on average increases by 2.68 pp with a range of 0.43 pp (Scenario 17) to 4.71 pp (Scenario 20), compared to the ones where it is retained (scenarios 5 and 8 respectively). The age group affected the most by benefit abolishment are children, presumably due to the loss of family and education benefits, equivalised to each member of a household. Children also feel the effect of UBI taxation more than working-age class. Whereas, if UBI is given to the elderly, the latter becomes the most sensitive group to taxation. In total, taxes on UBI increase poverty rate by 2.34 pp with a range of 0.63 pp (Scenario 12) to 3.71 pp (Scenario 19), compared to scenarios without taxes on UBI (6 and 13 respectively).

Despite the age-related differences, on average across all scenarios, poverty would be reduced by around 11 pp for all age groups, except for economically active working age class (7.6 pp reduction). It must be noted that, in 4 scenarios (5, 11, 17, and 23), poverty rate would be pushed below the 5% level. These scenarios envisage a relatively high amount of UBI payment (183.5 and 367 euros) and do not exclude pensioners from the recipient list.

4.3. Fiscal feasibility

Fiscal costs of each scenario (measured as a difference between additional government expenditure and revenue) are summarized in figure 9. In all scenarios, the introduction of UBI increases government social expenditure at least by 50%. In fact, the fiscal costs of the most expensive scenarios (which feature relatively high UBI amounts) exceed the direct tax and social security contribution revenue (scenarios 5, 6, 11, 13, 17, 19). As a percentage of GDP, the costs range from 2% (Scenario 20) to 21% (Scenario 5) (see table 4 for detailed information).

Figure 9. Fiscal costs of 24 UBI models



Sources: EUROMOD, authors' calculations.

Considering fiscal costs, most feasible scenarios are the ones in which current social benefits are abolished and the UBI amount is low (and taxed). The additional funding needed for these scenarios would amount to approximately 600 mil. euros, 2% of GDP (scenarios 19 and 20) or 1000 mil. euros, 3.5% of GDP (scenarios 21 and 22). The most effective scenarios meanwhile would require funding amounting to 20% of GDP (scenarios 5 and 6). In comparison, the planned costs of the heatedly-discussed 2018 tax reform in Latvia only amounted to 2.2% GDP (Dārziņa, 2017).

To clearly show the overly large extent of UBI reform, we consider a compensatory measure in form of a tax increase which would be required to finance the implementation of UBI for each scenario. We do this by proportionally raising the tax rates for employee and self-employed social insurance contributions, solidarity tax, and all three levels of progressive tax rates. Pensioners are given an extra tax burden only in scenarios when they receive UBI to ensure fair income distribution. For the fiscal costs not to exceed 0.1% of GDP or 28 mil. euros, the respective increases in tax rates range from 14% for scenario 19 to 147% for scenario 5 (see table 4). Tax increase also moderates the effect of each scenario on income inequality and poverty, which we are obliged to take into account. Even though the new policy shows positive results on both measures due to the retention of its progressivity, we consider such an extreme tax increase unrealistic. Nevertheless, effectiveness analysis of the scenarios after the compensatory measures can be found in Appendix C.

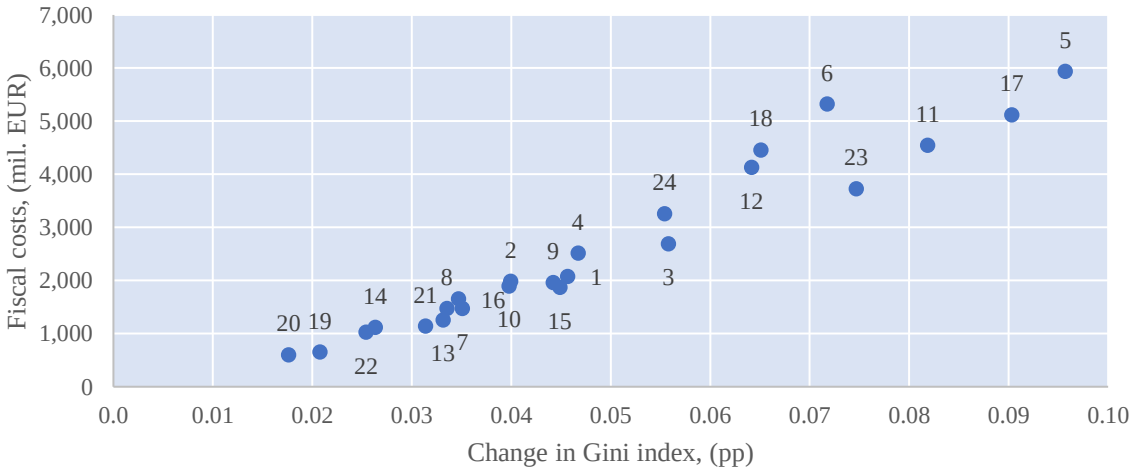
Next, we combine the two dimensions, effectiveness and feasibility by plotting the fiscal costs of each remaining scenario against changes in (a) Gini coefficient (Figure 10), (b) S80/S20 index (Figure 11), and (c) poverty rate (Figure 12). The positioning of scenarios confirms that the more effective scenario is in eradicating inequality and poverty, the greater are its fiscal costs. Nevertheless, the graphs are useful to evaluate the relative attractiveness of each scenario, comparing it to other scenarios with similar effectiveness or similar fiscal costs.

Table 4. Fiscal costs of each UBI scenario and the respective hike in tax rates needed to offset them

Scenario, nr	Additional funding needed, (mil. EUR)	Additional funding needed, (% of GDP)	Tax increase needed, (%)
Baseline scenario	*0*	*0*	*0*
Scenario (1)	2,074.51	7.4	51
Scenario (2)	1,981.83	7.0	54
Scenario (3)	2,689.89	9.5	67
Scenario (4)	2,514.01	8.9	69
Scenario (5)	5,935.44	21.0	147
Scenario (6)	5,320.08	18.9	145
Scenario (7)	1,469.98	5.2	32
Scenario (8)	1,471.34	5.2	35
Scenario (9)	1,959.99	7.0	41
Scenario (10)	1,895.68	6.7	44
Scenario (11)	4,543.87	16.1	84
Scenario (12)	4,128.86	14.6	85
Scenario (13)	1,253.83	4.4	31
Scenario (14)	1,118.94	4.0	31
Scenario (15)	1,868.49	6.6	47
Scenario (16)	1,650.40	5.9	45
Scenario (17)	5,113.82	18.1	129
Scenario (18)	4,456.25	15.8	122
Scenario (19)	650.59	2.3	14
Scenario (20)	601.12	2.1	15
Scenario (21)	1,139.80	4.0	24
Scenario (22)	1,024.06	3.6	24
Scenario (23)	3,723.00	13.2	69
Scenario (24)	3,256.41	11.5	68

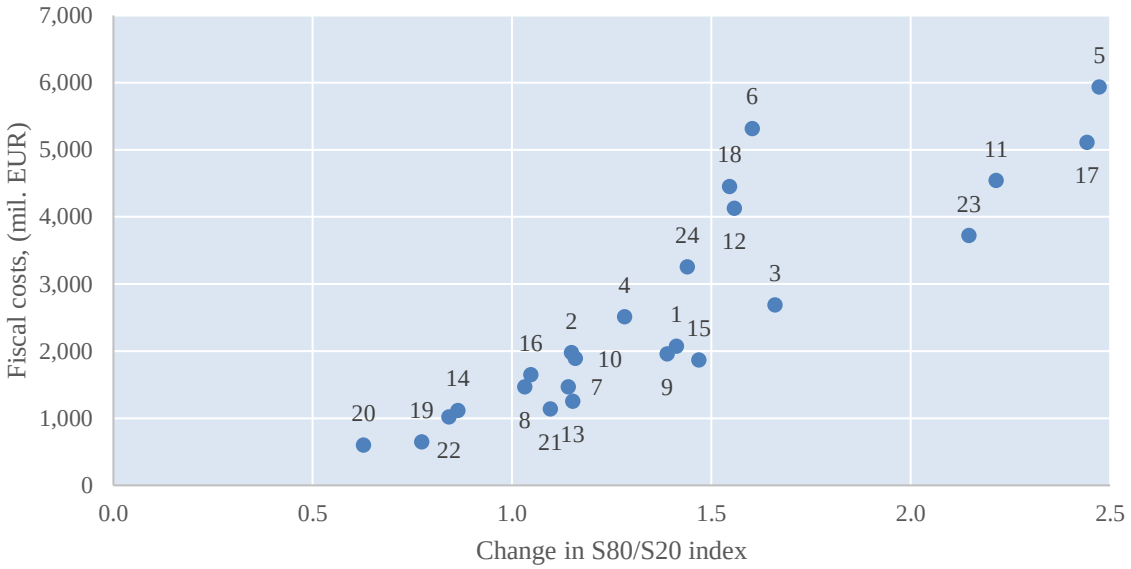
Sources: EUROMOD modelling system's default summary statistics, table made by the authors.

Figure 10. Feasibility and effectiveness of each UBI scenario using Gini index



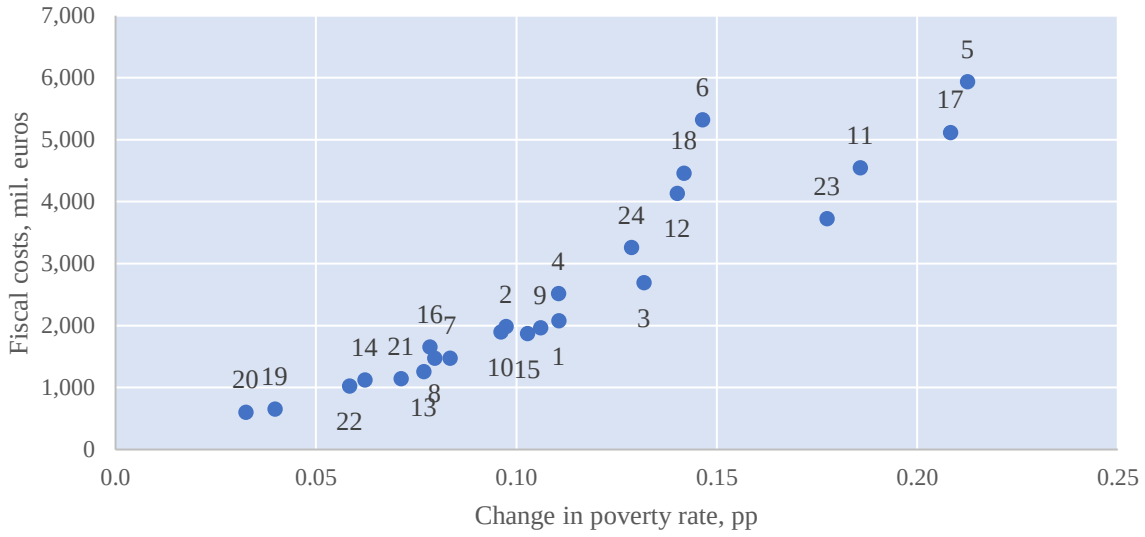
Sources: EUROMOD, authors' calculations.
Note: Each dot on the plot represents a scenario. Fiscal costs are measured as a difference between the increase in government expenditure and revenue. Change in Gini index is measured as a decrease in the index in percentage points.

Figure 11. Feasibility and effectiveness of each UBI scenario using S80/S20 index



Sources: EUROMOD, authors' calculations.
Note: Each dot on the plot represents a scenario. Fiscal costs are measured as a difference between the increase in government expenditure and revenue. Change in the S80/S20 index is measured as the absolute decrease in index.

Figure 12. Feasibility and effectiveness of each UBI scenario using poverty rate



Sources: EUROMOD, authors' calculations.
Note: Each dot on the plot represents a scenario. Fiscal costs are measured as a difference between the increase in government expenditure and revenue. Change in the poverty rate is measured as a decrease in the index in percentage points. Poverty rate or risk of poverty reflects the proportion of the population whose disposable income does not reach over the poverty line which is defined as 60% of the country-specific median disposable household income for one member, in our case, 367.58 euros a month.

Scenario pairs like 1 and 2, 3 and 4 (and so on) have similar UBI calibrations, the only difference being pensioners' eligibility to UBI. All 3 diagrams show that entitling pensioners to UBI have a significant improvement in inequality and poverty while the marginal cost of this operation is negligible compared to the extent it increases effectiveness. In a different manner, abolishing benefits and taxing UBI help to significantly drive the fiscal costs down, while maintaining a relatively high positive impact on income inequality and poverty reduction. Out of these two, benefit abolishment has a higher effect on cost reduction when UBI amount is lower, while taxation of UBI takes over the leading position when the amount is the highest.

5. Discussion

5.1. Effectiveness versus costs of UBI

Taking into account the effectiveness and fiscal feasibility of the 24 scenarios analysed, we note that the most effective scenarios in terms of reducing income inequality and poverty are also the most expensive ones. Nevertheless, there are certain properties of the UBI calibration that appear to improve its effectiveness without inducing higher costs. That being, scenarios where UBI is given to old-age pensioners are more effective and less expensive than scenarios where pensioners are disregarded.

Most recent available OECD data for 2016 suggests that Latvia significantly lags behind other OECD countries in terms of income inequality (OECD, n.d.a) and poverty (OECD, n.d.b). We consider the relative gap to OECD average to be a benchmark for evaluating our UBI scenarios. Overall, with exception of only 4 scenarios (14, 19, 20, 22), all scenarios meet the target (improvement by 9%) in terms disposable income Gini coefficient (OECD, n.d.a). As for poverty, the rate of poverty for the whole population required an improvement of 26.79% to be at the same level as the other OECD countries (OECD, n.d.b). In this case, only 3 scenarios (19, 20, 22) do not meet the target.

Additionally, there are 7 scenarios (3, 13, 15, 17, 19, 21, and 23) that achieve a certain level of effectiveness with less costs than others. Furthermore, some properties can be distinguished from these scenarios. Firstly, all of the scenarios include UBI for pensioners which notably improves the effectiveness. Secondly, 6 out of 7 abolish the existing social benefit system, a property which significantly reduces the fiscal costs. Thirdly, 4 out of 7 do not tax UBI, which somewhat reduces the government tax revenue, but at the same time improves the effectiveness. Furthermore, 2 out of 7 scenarios foresee UBI amount of 367 euros, hence inflating the overall fiscal costs to somewhat unrealistic amounts (13%-18% of GDP). Thus, from these 7 scenarios, 4 are selected (3, 13, 15 and 21) that meet the targets and do not exceedingly inflate the costs.

The disposable income Gini coefficient improvement comparing to the baseline for the selected 4 scenarios ranges from 9.2% to 16.3% (respective Gini coefficients 0.3115 and 0.2870), while the rate of poverty is improved by 31.8%-58.9% (respective poverty rates 0.15 and 0.09). The additional funding needed for these scenarios ranges from 1140 mil. euros to

2690 mil. euros, which is 17%-46% of the government revenues from direct taxes and social contributions, or 4%-10% of the GDP in 2018.

The results of our simulations allow us to accept H1b stating that *"if UBI is implemented in Latvia, then it will decrease income inequality and poverty"*. In most of the scenarios, significant improvements in income inequality and poverty can be noted. Furthermore, this allows Latvia to improve its relative position among OECD peers. Moreover, all of our scenarios showed a positive effect on income inequality and poverty and left the low-income households better off. This finding has not always been evident in studies for other EU countries (Reed & Lansley, 2016). Furthermore, in contradiction with Laurinavičius and Laurinavičius (2016) point, our estimates suggest that a key element in most effective scenarios is the abolishment of the existing social benefit system.

In terms of the government budget, the results suggest that H2a stating that *"if UBI is implemented in Latvia, then it will have a detrimental effect on the government budget"* is accepted. Our analysis shows that an effective UBI policy would require additional funding amounting to at least 6% of GDP, which translates into a tax increase of at least 35%. Moreover, even the most economical scenario would require additional funding around 2% of GDP, that would result in a tax increase of 15%. Given the rigidity of fiscal framework in the EU and limited fiscal space available for the government of Latvia, the measure of such magnitude does not seem realistic. This is in line with the findings from Finland, France, Italy and the UK (Browne & Immervoll, 2018), the US (Greenstein, 2017), Finland (Kostinen & Perikö, 2014) and Lithuania (Laurinavičius & Laurinavičius, 2016) stating that an implementation of effective UBI requires a substantial amount of additional tax revenue.

5.2. Potential long-term implications

Our estimates suggest that in the case of Latvia UBI might have a beneficial effect on long-term growth. This stems from findings of a seminal study by Persson and Tabellini (1994) who showed that lower levels of income inequality and poverty lead to higher potential growth (see also Perry et al., 2006). Furthermore, due to its equality enhancing effect UBI might lead to other benefits as well, such as: increase in investment opportunities, higher credit market activity (Aghion et al., 1999; Hall, & Howell-Moroney, 2012), higher educational attainment (Ferguson

et al., 2007), improved health conditions (Ngoma & Mayimbo, 2017), increased level of happiness (Alesina et al., 2004) and improved overall wellbeing (Kangas et al., 2019).

5.3. Limitations and assumptions

The main limitation of the research is the stationary nature of the model. The research does not take into consideration second-round effects: neither in the form of effects on consumption nor on the potential behavioural change of the working-age population. The implementation of UBI might affect the incentives to work, which should be estimated by more extensive quantitative and qualitative research. Nevertheless, we do not deviate from most of the existing research and limit our study to the direct effects which implementation of the UBI would have on disposable income.

Another drawback related to the stationarity of the model is that we are not able to predict the long-term impact of the UBI policy. One might argue that macroeconomic impact should also be taken into consideration as the third aspect for the evaluation of UBI model. We try to mitigate this shortfall by looking at previous studies that investigated the relationship between income inequality, poverty and long-term growth.

The measurement of income inequality might also lead to some drawbacks. For instance, the Gini coefficient fails to encounter an absolute increase in income. Accordingly, even if the overall level of income increased for all parts of society and the level of poverty declined, the income inequality index could still increase (Human Sciences Research Council, 2014). To overcome this issue, we use a set of alternative measures, such as, absolute and relative changes in disposable income by income deciles and S80/S20 index.

6. Conclusion

Compared to its OECD peers, Latvia has relatively high levels of income inequality and poverty. Conventional methods have shown limited success in tackling the issue, thus giving space for policy debate focusing on alternative solutions. In this study, we analyse the effectiveness and feasibility of one of them: universal basic income (UBI). We employ EUROMOD microsimulation model with anonymized microdata from the EU-SILC survey to investigate if UBI could act as a potential remedy for income inequality and poverty in Latvia. This is done by constructing multiple scenarios that represent different ways how UBI could replace the existing tax and benefit policies.

Our main findings show that in all of the scenarios introduction of UBI would indeed reduce income inequality and poverty, bringing Latvia to at least the average level of the OECD countries. However, the costs of an effective UBI implementation are rather high ranging from 6% to 21% of GDP. Several features that are common for the majority of the most effective scenarios stand out. Firstly, including pensioners in the UBI recipients list seem to significantly improve the reduction of income inequality and poverty. Secondly, abolishment of the existing social benefit system helps to drive the fiscal costs down without seriously damaging the effectiveness of UBI policies.

Despite the success of UBI in reducing income inequality and poverty, the fiscal costs restrain us from considering its implementation. Given the rigidity of fiscal framework in the EU and limited fiscal space available for the government of Latvia, a measure of such magnitude is rather unrealistic. Furthermore, we do not consider alternative remedies for fighting inequality and poverty such as higher means-tested benefits, which could not only be cheaper but also more effective.

Nevertheless, we believe that our analysis is a valuable contribution to the ongoing debate about the viability of UBI in Latvia. The paper presents a solid ground for discussions about different components of UBI policy and how they affect important inequality and poverty measures as well as fiscal costs, which supplemented by a more extensive research on behavioural effects of UBI on work incentives and social wellbeing would present a truly profound image of UBI from all its social and economic aspects.

7. List of references

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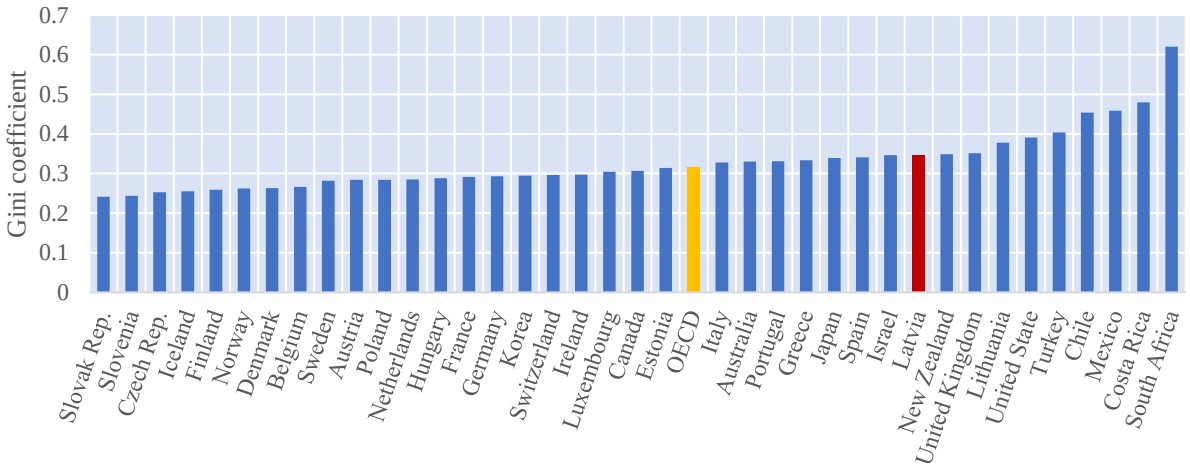
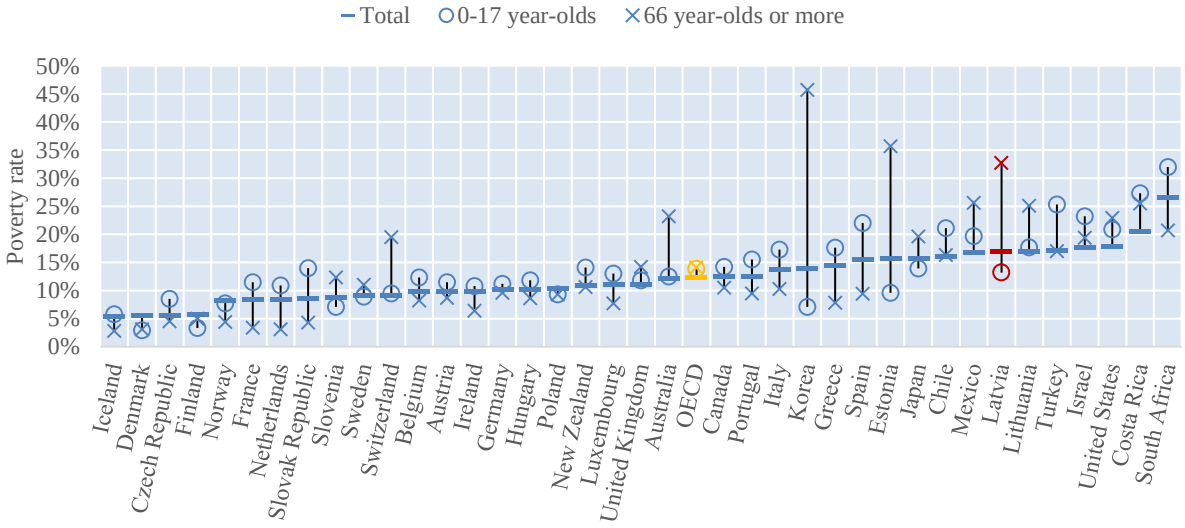
8. Appendices

Appendix A. Gini coefficient in OECD countries (2016)



Sources: Data taken from the OECD database (OECD, n.d.a), graph made by authors
Note: The graph displays disposable income inequality (post taxes and transfers). 0 represents perfect equality while 1 marks perfect inequality. The OECD member with the highest inequality is Mexico but the leader for equality is the Slovak Republic. Gini coefficient for Latvia is 0.346, compared to the OECD's average of 0.315. Costa Rica and South Africa are added to the table as the candidates for OECD; however, are not considered when ranking Latvia in terms of income inequality. Gini coefficient is usually calculated using the Lorenz curve which represents the cumulative share of income respective to the fraction of population from poorest to the richest.

Appendix B. The rate of poverty in OECD countries (2016)



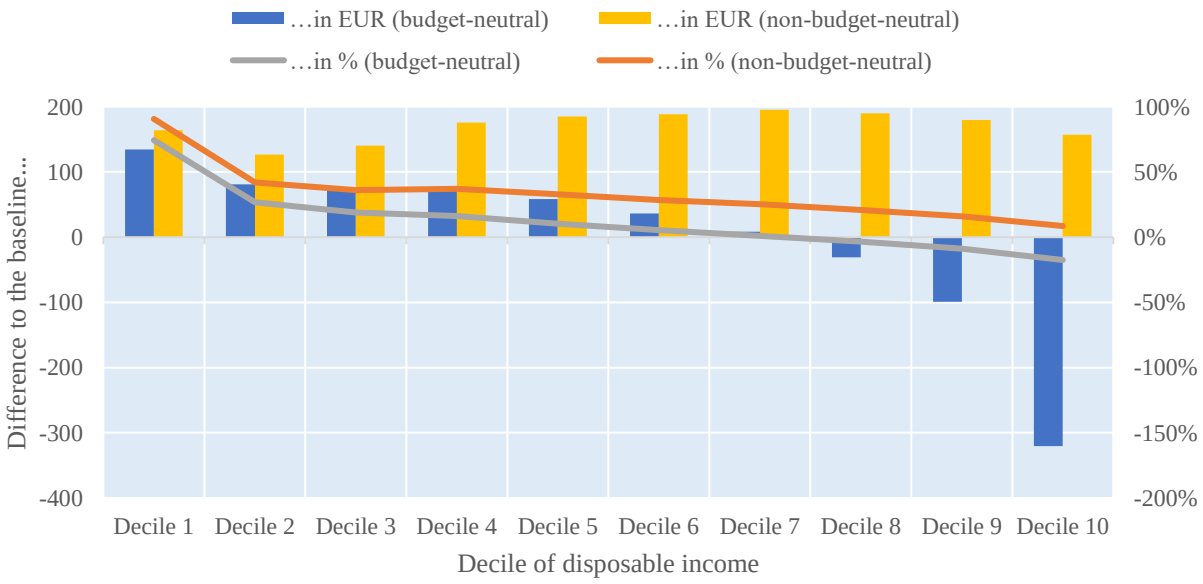
Sources: Data taken from the OECD database (OECD, n.d.b), graph made by authors.
Note: The graph displays the total rate of poverty, as well as for different age groups - children and old-age-pensioners. Percentage of poverty rate represents the fraction of citizen's falling under the threshold of poverty risk, varying by country. The OECD member with the highest rate of poverty is the United States, but the leader with the least risk of poverty is Iceland. The total rate of poverty in Latvia is 16.8%, compared to OECD's average of 12.3%. The poverty rate for pensioners in Latvia is 32.7% - 3rd highest in OECD, but the child poverty of 13.2% is below the OECD average. Costa Rica and South Africa are added to the table as the candidates for OECD; however, are not considered when ranking Latvia in terms of poverty.

Appendix C. Effectiveness analysis of UBI scenarios after fiscal neutrality

On average, the Gini coefficient of scenarios after the required tax increase decreases by 7.85 pp, which is by 3 pp more than before tax increase. In scenario 5, the Gini coefficient even decreased more than 2 times, scoring 0.169, while the smallest decrease was for Scenario 20, scoring 0.319. The same scenarios without tax increase meanwhile scored 0.247 and 0.325. In 5 scenarios, namely 2, 4, 5, 6, and 18, the tax reform managed to decrease income inequality even before giving out UBI. Gini coefficient after only taxes and pensions decreased by 0.026 the highest in scenario 6. However, the others are not necessarily the scenarios which experienced the highest tax increase. The main condition for this effect is that UBI is not taxed.

More detailed impact on income inequality is also represented by income deciles. While the average income of the whole population remains the same due to budget neutrality, the additional income of the poorest part of the population has to be compensated by the richest part (see figure C.1). In particular, three upper deciles experience losses in all 24 scenarios, 3%, 9%, and 17% respectively. Compared to decile 10 (monthly loss of 321 euros on average), decile 1 gains only 134.45 monthly euros; however, that constitutes 74% of their previous income, 16 pp lower than in non-budget-neutral scenarios. The loss of income, relative to the state prior to the new tax policy, increases slightly for each decile, resulting in 26 pp lower income for decile 10.

Figure C.1. Changes in mean equivalised income by decile groups (mean of 24 UBI models before and after the tax increase)

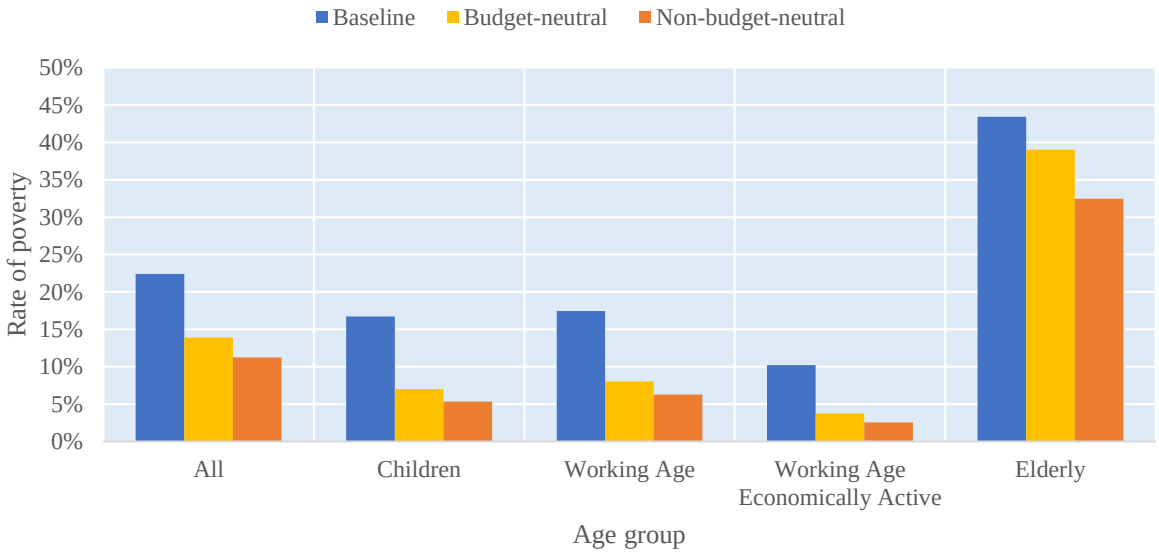


Sources: EUROMOD, authors' calculations.

Another evidence of higher equality is S80/S20 ratio, which decreased by 2.1, and shows that, in our budget-neutral simulation, the richest 20% earn on average by 4 times more than poorest 20%. The leader in this case as well is scenario 5 that decreased S80/S20 ratio by 3.7, while scenario 20 decreased it by 0.9 only.

Tax policy impact on poverty rates presents a different overview. While the general tendency remains the same and UBI indeed decreases poverty, the effect is smaller than before tax increase (see figure C.2). The poverty level dropped to 13.9% on average, compared to 11.23% when running a budget deficit. The main losers from the tax reform are elderly people whose poverty rate was reduced only by 4.4 pp and is by 6.5 pp higher than without tax reform. In scenarios 7 and 20, the poverty rate of elderly people is even higher than in the baseline scenario by 0.56 pp and 0.22 pp respectively. Other age groups are affected more strongly, with children being the most affected (9.7 pp poverty reduction) and working-age class the second (9.4 pp of overall poverty reduction and 6.4 pp for economically active workers).

Figure C.2. Poverty rates by different age groups (mean of 24 UBI models before and after the tax increase)



Sources: EUROMOD, authors' calculations.
Note: Poverty rate or risk of poverty reflects the proportion of the population whose disposable income does not reach over the poverty line which is defined as 60% of the country-specific median disposable household income for one member, in our case, 367.58 euros a month.

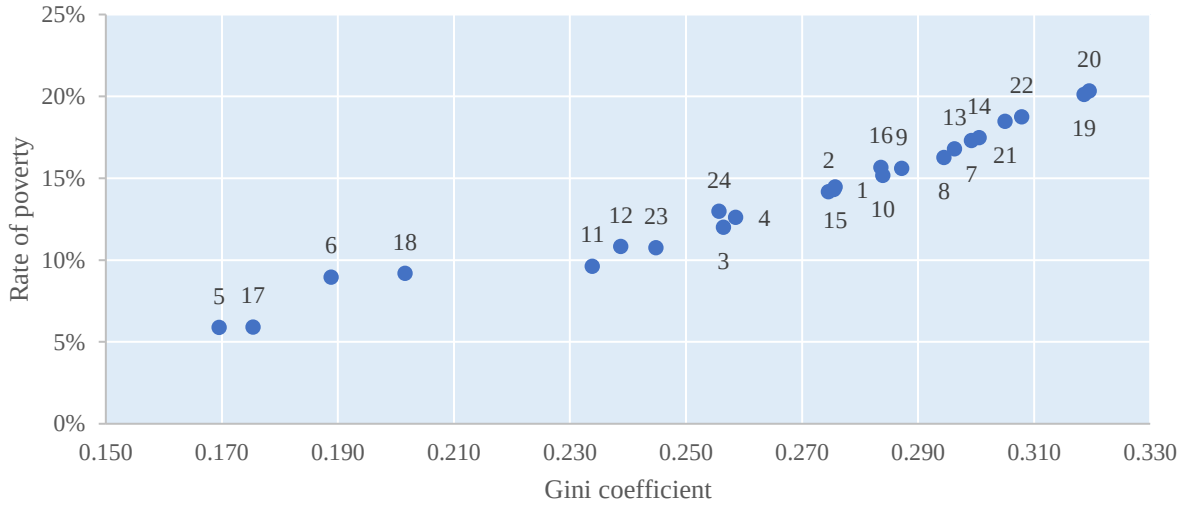
The same scenarios 5 and 20 as for inequality set the boundaries also for poverty, positioning other scenarios in between 5.9% and 20.3% as the rate of overall poverty. The most effective scenarios 5 and 17 both reduce poverty by 16.5 pp. Nevertheless, scenario 17 demands

lower tax increase and addresses the poverty of elderly people more effectively, reducing it by 18.4 pp. None of the scenarios managed to eradicate poverty completely for any of the age groups as it was the case before tax increase. However, 5 scenarios (5, 6, 11, 17, and 18) pushed overall poverty below 10%, out of which all gave the highest amount of UBI and 4 did not tax UBI.

Figures C.3 and C.4 combine income inequality and poverty, indicating the 5 most effective scenarios from the perspective of all 3 criteria: Gini coefficient, S80/S20 index, and risk of poverty. Starting from the most effective, those are scenarios 5, 17, 6, 18, and 11 which are also among the scenarios that required the biggest tax increase. Benefit retention and UBI for pensioners in general increase the effectiveness, the role of these conditions, however, were minor. Rather effective are also scenarios 23, 12, 3, 24, and 4, of which only 3 and 4 give the second level of UBI amounting to 193 EUR. From the results, we can also derive that scenarios which are the most positively affected by tax increase are 6 and 18. After tax increase, these scenarios experience the highest decrease in Gini coefficient by 0.082 and 0.076 and S80/S20 index by 1.66 and 1.58 respectively. The scenarios are also among the ones whose rate of poverty increase only marginally by 1.2 pp and 1.0 pp respectively, while other most effective scenarios experience huge increase, 6.1 pp being the maximum (Scenario 23). Both of these scenarios give the highest level of UBI, exclude pensioners of the model, and do not tax UBI.

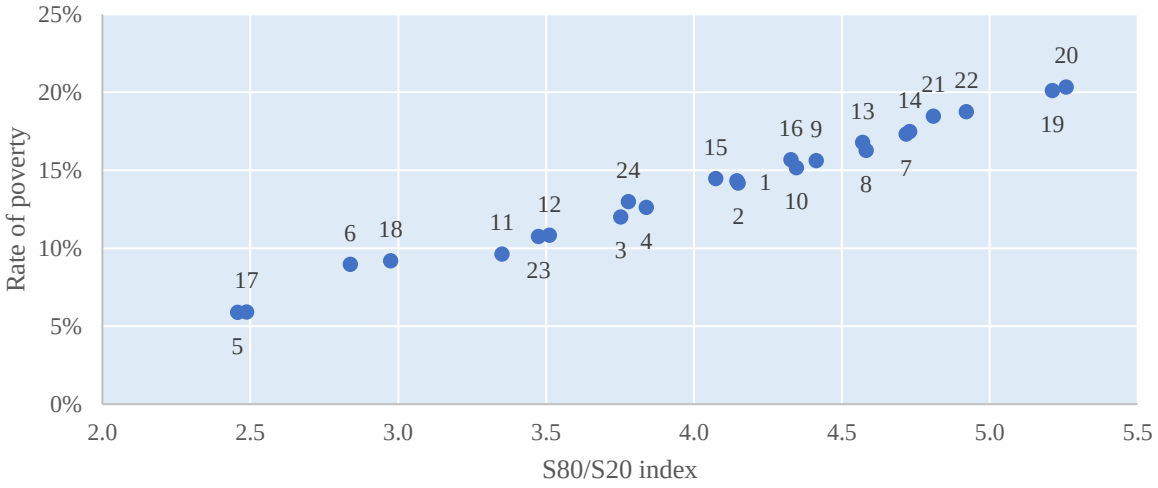
Meanwhile, also the 5 least effective are the same according to all three criteria: 20, 19, 22, 21, and 14 starting from the least effective. The tax increase demanded by the scenarios is no higher than 31%, which makes them also among the relatively cheapest. All 5 scenarios abolish the existing benefit system and 4 of them tax UBI. Moreover, only two lowest UBI levels are represented among the least effective scenarios.

Figure C.3. The effectiveness of 24 UBI scenarios after tax increase by Gini coefficient and rate of poverty



Sources: EUROMOD, authors' calculations.
Note: Each dot on the plot represents a scenario. The rate of poverty or risk of poverty reflects the proportion of the population whose disposable income does not reach over the poverty line which is defined as 60% of the country-specific median disposable household income for one member, in our case, 367.58 euros a month.

Figure C.4. The effectiveness of 24 UBI scenarios after tax increase by S80/S20 index and rate of poverty



Sources: EUROMOD, authors' calculations.
Note: Each dot on the plot represents a scenario. The rate of poverty or risk of poverty reflects the proportion of the population whose disposable income does not reach over the poverty line which is defined as 60% of the country-specific median disposable household income for one member, in our case, 367.58 euros a month.