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No country for old men? Microsimulation effects of activating pensioners on the labour market

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Abstract. Being a pensioner in Croatia carries certain risks of poverty and inequality compared to the rest of the population. Low level of average pension compared to the minimal wage is just one case in point. On the other hand, the labour market shortage is not negligible and there is also a poor track record when it comes to pension system reforms in the last two decades. This paper investigates a possible path of the future pension system reform aimed at increasing household income levels – focused on the labour market participation of people aged 65+ who are willing and able to solve labour shortages present in the market. The general aim of the paper is to analyze the effects that the establishment of the Pensioners Service Center might have on market income, mean household income by decile groups, poverty and inequality indices. It fills the research gap by conducting the first microsimulation of the pension system reform in Croatia focusing on market income. The hypothetical reform is simulated using the tax–benefit microsimulation model EUROMOD based on EU–SILC 2019 data for Croatia. Results confirm market income as the main cause of income inequality as well as that the second decile is the target group of the proposed intervention. Pensioners have a clear monetary incentive to increase their labour supply, which in return decreases all poverty and inequality indices.

Keywords: ageing, inequality, microsimulation, pension system reform, poverty

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1. Introduction

> "One of the things you realize about gettin older is that not ever'body is goin to get older with you"
>
> – *Sheriff Ed Tom Bell*

A famous line by Sheriff Ed Tom Bell, played by renowned actor Tommy Lee Jones, in the Hollywood movie titled "No Country for Old Men" might have a different meaning when observed with respect to the re-activation of pensioners on the labour market. Namely, not all pensioners grow older and retire, some of them are willing to prolong their active status on the labour market due to monetary or even non–monetary incentives [1]. This paper focuses on more than 1.2 million pensioners living in Croatia with the majority of them receiving pensions below the level of the minimum wage in Croatia, i.e. HRK 3750.00 [6, 16].

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Furthermore, if you are aged 65+ and you live in Croatia you have a huge chance of living below the at–the–risk–of–poverty–rate in Croatia which currently stands at 19.2% [5]. At the same time, Croatia is experiencing labour market shortages with no clear strategy on how to attract foreign workers besides temporary quotas for the tourism and the construction sector. Since inadequate pension system reforms in the last two decades have failed to ensure a decent living standard for pensioners' households, the aim of this paper is to investigate an interesting research avenue: labour market participation of people aged 65+ who are willing and able to solve labour shortages in the short run. During May 2022 six focus group interviews were conducted with the help and participation of members of *Matica umirovljenika Hrvatske*. On 18th May 2022 and 19th May 2022 focus groups were established to discuss the following two topics: the promotion of active participation of the elderly population in the labour market, and pension system reforms. These interviews yielded several interesting conclusions out of which we single out the following: labour law amendments aimed at keeping the population 65+ active through mentorship and/or part-time employment contracts and the establishment of the Pensioners Service Cente r(PSC). The main idea of the PSC is to act as a marketplace where supply and demand for currently–retired–potential–workers would meet (similar to the existing Student Centre and its role for the student labour force). The PSC would encourage self–employment, offer lifelong learning programmes and promote active participation of the elderly population in the labour market. The establishment of the PSC was the main motivation for this paper and the microsimulation exercise conducted within it.

This places our subject of research within the social (i.e. pension) system reform. The pensions are usually not simulated because of specific information required in simulation [20], but EUROMOD contains data about the economic status of pensioners, along with all other necessary data for microsimulation that this paper uses. The simulation of the reform is a useful tool for presenting future consequences of the introduction of the reform on public finances and the population's income level. Hence, this paper tends to analyse the pension system reform with the following goals: (i) to reduce poverty and inequality, (ii) to stimulate employment and (iii) to achieve more equality of income distribution. In order to do that it sets the following hypothesis, following seminal paper [7]: "The establishment of the PSC will decrease income inequality thus proving that the effects of the permanent income hypothesis can be decreased by optimal policy interventions".

The paper [9] uses notion on the permanent and transitory component of income where the permanent component refers to, for example, the effect of occupation while the transitory component refers to, for example, the effect of illness on the level of income. Since the general aim of the paper is a microsimulation of the effects of the re–activation of pensioners on the labour market it directly follows that this will affect the permanent component of one's income (i.e. occupation shifts from the pensioner to the employee), thus the permanent income hypothesis. Although it is tempting to interpret the permanent income hypothesis solely concerning consumption, due to the opposing approaches within the economic theory that range from Keynes's marginal propensity to consume to Friedman's permanent component, the paper builds on [7] conclusion on increasing inequality for each age group. Namely, "... if the age distribution of the population remains unchanged, and if the inequality in the distribution of earnings remains constant, consumption and income inequality will also remain constant in the society as a whole, even though inequality is increasing for each age group" [7]. The paper rests on the premise that re-activating pensioners is a possible path to decreasing inequality.

The importance of encouraging part–time paid work opportunities for older people of retirement age is also highlighted in [12]. Indeed, many countries aim to increase labour market participation at an older age. The increase in the retirement age affects the frequency of voluntary work provisions. [8] report the positive effect that retirement has on the frequency of voluntary work provision in Europe and the U.S. for the period 2009–2017. [1] highlight the role of identity when analysing the labour market participation of the elderly. If one is no longer a

worker, how does that affect his interaction with other economic agents? If a pensioner does not manage in new circumstances, (s)he may want to return to the labour market and a familiar role. Besides the increase in income, pensioners opt to work (despite receiving a pension) due to a variety of reasons. [10] single out the following reasons: (i) keeping active and fit, (ii) maintaining social contacts and (iii) others.

Similar to [3], who use behavioral microsimulation techniques as a tool for the analysis of public policies and the response of individuals and households to changes in their budget, this paper models pensioners' labour supply and the effect on income inequality in order to confirm or reject the stated hypothesis. [15] also use EUROMOD to simulate a set of common illustrative pension system reforms and patterns of poverty among the elderly in Denmark, Germany, Italy and the UK. The results suggest that different paths for reform are necessary for countries to achieve common objectives. Some research based on the microsimulation approach shows that ageing does not have a positive effect on the income dispersion increase [2]. Inequality might also be reduced due to higher educational attainment.

According to the literature [13, 17] all fiscal interventions reduce inequality and poverty, except indirect taxes which widen the income gap among the population and increase poverty and inequality. Fiscal expansion and reforms in the period 2018–2021 in Croatia reduced poverty but increased inequality as the consequence of income tax reduction which favors the population with higher income [13]. This paper adds to the literature since it focuses on reforms that increase market income and observes the effects on basic poverty and inequality indices. To the authors' knowledge the paper presents the first microsimulation of pensioners' activation for the case study of Croatia.

The rest of the paper is organized as follows. After the introduction, Section 2 provides an overview of the methodology and data. The results of the microsimulation and the following discussion are presented in Section 3. Section 4 provides the conclusion.

2. Methodology and data

This research uses actual data provided by EU–SILC (European Union Statistics on Income and Living Conditions). The main method used is the microsimulation model EUROMOD for the year 2019 for the Republic of Croatia. One needs to acknowledge the complementarity between microsimulations based on representative microdata and a hypothetical household simulation in the context of policy analysis. Microsimulations show the effects on the population (e.g. poverty, inequality and budget) while hypothetical households present the effects of the tax–benefit system [11].

Every microsimulation consists of two scenarios. The first step is to simulate a base scenario, i.e. the actual situation in the observed moment. After that, a reform scenario which includes changing parameters is simulated [19]. Our reform scenario simulates the following hypothetical reform: introduction of permitted work up to the amount of HRK 1250.00 per month (pensioners can work up to 42 hours per month at the minimum wage per hour equal to HRK 30.00). The microsimulation discusses the direct monetary effects of the potential reform on three levels: (i) fiscal implication on the total population, (ii) effects on the number of receiving households and their socio-demographic characteristics, and (iii) effects on the income distribution and the risk of poverty.

For certain groups of households that receive social benefits such as old–age benefits, allowances for heating or household expenses, reactivation on the labour market (part–time work) would not be profitable. The reason for that is straightforward: a household's market income increases upon reactivation on the labour market, which eliminates or reduces certain social benefits. Since household disposable income is calculated by adding private transfers and social benefits to market income and subtracting taxes and social contribution of every person in the household, the role of the state and its social services is important. EUROMOD differentiates

between the benefits that are fully simulated, benefits that are partly simulated and benefits that are not simulated but included in the input data [18]. State pensions are not simulated and the amount is taken from the EU–SILC survey. Also, non–cash or in–kind benefits are not included in the exercise. Thus, the only constraint for pensioners is the one connected to social benefits, so microsimulation examines the usefulness of the proposed policy/reform for improving the profitability of work depending on that.

One clear incentive for the reactivation of pensioners is the level of their pensions. In June 2022 there were 456 065 pensioners, excluding disability pensions and not including pensions paid through international agreements, whose pensions amounted to less than HRK 3500.00 [6]. At the same time, there were 19767 pensioners (beneficiaries of old–age, early old–age and family pension) who work up to 20 hours a week [6]. Unfortunately, there is no data on the structure (age, net pension, type of pension) of pensioners who work according to the existing Pension Insurance Act. The size of that population (relative to the total of 3.8 million inhabitants in Croatia [4] and their average net pensions (relative to the minimum wage of HRK 3750.00) are presented in Table 1.

Type of pension	Share	Average net pension in HRK
Old–age pension	54.27%	2934.50
Early pension	18.26%	2904.24
Disability pension	8.57%	2191.40
Survivor's pension	18.72%	2183.28

Source: Croatian Pension Insurance Institute

Table 1: *Number of pensioners based on the type of pension.*

Table 2 shows that in June 2022 there were just 19 767 pensioners (2% of all retired people in Croatia) active on the labour market. The conditions under which they can re–activate are the following: pensioners who are beneficiaries of an old–age pension, an early old–age pension, or a family pension and are older than 65 years. Retired police officers and soldiers enjoy special privileges due to their early retirement schemes while pensioners who use a disability pension are not allowed to work at all.

Type of pensioners	Number of pensioners	Share
Working pensioners	19767	2%
Pensioners with pension up to HRK 3500.00	456065	48%
Pension beneficiaries	953119	100%

Source: Croatian Pension Insurance Institute (June 2022) [working pensioners: beneficiaries of old–age, early old–age and family pension; pensioners with pensions up to HRK 3500.00: not including disability pensioners; pension beneficiaries: not including active military personnel, police officers and authorised officials; not including international agreements]

Table 2: *Type and number of pensioners in Croatia, June 2022.*

The microsimulation exercise assumes that the PSC offers its services to the most vulnerable group of pensioners (pension below HRK 3500.00) that can be found among pensioners who are beneficiaries of old–age, early old–age and family pension older than 65 years that have the right to work. Additionally, the microsimulation assumes that the employer does not pay pension and health insurance. The PSC could charge a commission for its services to the employer but the administrative costs of introducing this measure and the centre's operating costs are not analyzed in this paper.

EUROMOD data (EU–SILC) used in this research contain 4519 pensioners older than 65 years (excluding disability pensioners) with pensions lower than HRK 3500.00. They represent 711059 people in Croatia with the same characteristics. The exercise simulates the reform scenario in a way that it randomly chooses pensioners (with the above–mentioned characteristics) and increases their market income by an additional HRK 1250.00. More precisely, the exercise yields three different scenarios:

1. 2% of pensioners are working on *Pensioners Service Centre contracts* for a salary of HRK 1250.00 monthly
2. 5% of pensioners are working on *Pensioners Service Centre contracts* for a salary of HRK 1250.00 monthly
3. 10% of pensioners are working on *Pensioners Service Centre contracts* for a salary of HRK 1250.00 monthly

The number of hours worked for employees is excluded, i.e. all pensioners stop working upon reaching the maximum amount of salary (HRK 1250.00). In this way, the simulation creates hypothetical data to understand how policy works.

3. Results and discussion

The output from EUROMOD shows the change in total market incomes (Table 3), the change in the level of poverty (Table 4) and inequality indices (Tables 5–6) and the change in household income by decile groups (Table 7).

	Reform Scenario 1		Reform Scenario 2		Reform Scenario 3	
Base scenario	Reform 2%	Difference to base	Reform 5%	Difference to base	Reform 10%	Difference to base
168898	169050	152.31	169291	393.43	169577	679.06

Source: Authors' simulations from EUROMOD

Table 3: *Total market incomes, base scenario vs. reform scenario (yearly, millions, HRK).*

The fiscal overview presented in Table 3 shows that total market incomes increase as the share of working pensioners increases. If 10% of pensioners aged 65+, with pensions below HRK 3500.00 reactivate on the labour market, the total market income will increase to HRK 679 milion per year. Market/original incomes are the sum of income from employment and self-employment plus income from other sources. Other sources include income from investment, property, private pensions, private transfers, and children younger than 16, minus private transfers paid to other households. The estimated increases are small but one needs to have in mind that the focus is on pensioners, and among them on the poorest members of the Croatian society.

Households are defined as being at risk of poverty (poor) if their equivalised disposable household income (every individual in the household has at his/her disposal the same amount of money) is below the poverty line. The poverty line is defined as 60% of the country–specific median equivalised disposable household income. Table 4 points to the positive relationship between the re-employment of pensioners and poverty levels. Namely, if 2 percent (5 percent) of pensioners are re–employed, poverty will decrease by 0.32 pp (1.08 pp). Out of the five groups presented in Table 4 one can easily see that in all three reform scenarios it is the elderly who report the highest changes as opposed to children and working–age economically active

		Reform Scenario 1		Reform Scenario 2		Reform Scenario 3	
	Base scenario	Reform 2%	Difference to base	Reform 5%	Difference to base	Reform 10%	Difference to base
Population	19.14%	19.03%	−0.11pp	18.83%	−0.31pp	18.61%	−0.53pp
Children	17.32%	17.27%	−0.06pp	17.27%	−0.06pp	17.22%	−0.11pp
Working age	15.31%	15.25%	−0.06pp	15.09%	−0.13pp	15.10%	−0.21pp
Working age Economically Active	8.11%	8.07%	−0.03pp	8.02%	−0.09pp	7.95%	−0.16pp
Elderly	32.55%	32.23%	−0.32pp	31.47%	−1.08pp	30.67%	−1.88pp
FPL	3088.48						

Source: Authors' simulations from EUROMOD

Table 4: *Basic Poverty Indices using a fixed poverty line FPL.*

members of the society. This again re–confirms the importance of market income for the poverty levels of pensioners. However, one needs to acknowledge the fact that the effects of simulations may be difficult to translate into real-life situations due to a mismatch in pensioners' skills and knowledge and employers' demands. Pensioners' impaired health condition is another constraint in this process.

The basic inequality measures are shown in Tables 5–6. The Gini measures the distribution of income within a country where 0 means perfect income equality and 1 means perfect income inequality. The S80/20 ratio – also referred to as the income quintile share ratio – is the ratio of the total income received by the 20% of the population with the highest income to 80% of the population with the lowest income. All basic indicators of inequality indicate that the inclusion of the poorest pensioners in the labour market has a significant and positive impact on the entire population. The reduction in inequality is not large, but it increases with the growth of working pensioners. The highest value of the Gini coefficient is shown by the original income, which indicates that the original income is the main cause of high inequalities and should be the focus of policy interventions. Furthermore, the results from Tables 5–6 confirm our hypothesis. Namely, the simulation shows that the implications of the life cycle theory (young and old members of the society spend, rather than save money, while people of working age save money) can limit inequality due to the positive policy intervention outside the ones proposed by [7], e.g. insurance arrangements.

		Reform Scenario 1		Reform Scenario 2		Reform Scenario 3	
	Base scenario	Reform 2%	Difference to base	Reform 5%	Difference to base	Reform 10%	Difference to base
Original Income	0.4778	0.4772	−0.0006	0.4762	−0.0016	0.4749	−0.0029
Original Income after Taxes/SIC	0.4617	0.4610	−0.0007	0.4597	−0.0020	0.4582	−0.0035
Original Income incl. Public Pensions after Taxes/SIC	0.3184	0.3181	−0.0003	0.3174	−0.0010	0.3165	−0.0019
Disposable Income	0.2985	0.2981	−0.0003	0.2975	−0.0010	0.2966	−0.0019

Source: Authors' simulations from EUROMOD

Table 5: *Basic Inequality Indices with respect to Gini.*

		Reform Scenario 1		Reform Scenario 2		Reform Scenario 3	
	Base scenario	Reform 2%	Difference to base	Reform 5%	Difference to base	Reform 10%	Difference to base
Original Income	12.4382	12.3983	−0.0400	12.1993	−0.2389	11.8732	−0.5650
Original Income after Taxes/SIC	11.0662	11.0252	−0.0410	10.8366	−0.2296	10.5207	−0.5456
Original Income incl. Public Pensions after Taxes/SIC	5.6402	5.6056	−0.0346	5.6016	−0.0386	5.5661	−0.0741
Disposable Income	4.9391	4.9138	−0.0253	4.8995	−0.0396	4.8776	−0.0615

Source: Authors' simulations from EUROMOD

Table 6: *Basic Inequality Indices with respect to S80/S20.*

All estimations point to the fact that one can achieve the same results presented by [21], i.e. reducing budgetary expenditures, increasing labour participation and positive redistributive effects, by activating positive incentives (those who are willing can re–enter the labour market) instead of concentrating on constraints (e.g. raising the retirement age). Both politically and socially, incentivising is easier than imposing constraints. Table 7 shows the mean equivalised income of decile groups. Decile groups are calculated by ranking individuals according to their equivalized disposable household income and dividing them into ten similar–sized groups.

		Reform Scenario 1		Reform Scenario 2		Reform Scenario 3	
	Base scenario	Reform 2%	Difference to base	Reform 5%	Difference to base	Reform 10%	Difference to base
Decile 1	2342.24	2353.88	11.65	2374.70	32.46	2397.25	55.01
Decile 2	4276.81	4291.55	14.73	4326.72	49.91	4363.16	86.35
Decile 3	5836.61	5845.91	9.29	5863.91	27.29	5891.43	54.82
Decile 4	7818.15	7834.45	16.30	7850.80	32.64	7872.76	54.60
Decile 5	9738.16	9751.30	13.13	9758.16	19.99	9772.26	34.10
Decile 6	10553.58	10557.97	4.38	10569.30	15.72	10579.00	25.42
Decile 7	12475.23	12475.23	0.00	12487.60	12.37	12493.68	18.45
Decile 8	14084.36	14089.22	4.86	14089.97	5.61	14099.40	15.04
Decile 9	16329.64	16329.64	0.00	16329.64	0.00	16329.64	0.00
Decile 10	24044.07	24051.95	7.88	24054.76	10.69	24055.88	11.82
All	10107.90	10116.51	8.61	10130.14	22.24	10146.28	38.39
Poor	3170.36	3170.45	0.09	3179.05	8.69	3184.15	13.79

Source: Authors' simulations from EUROMOD

Table 7: *Mean household income by decile groups.*

Similar to the findings by [14] unretirement is part–time and provides a non–trivial source of income. Simulation confirms that household income increases as the number of working pensioners increases, but more importantly it identifies the target group for the intervention. Since the second decile will have the greatest benefit from re–activating on the labour market (taking into consideration possible loss of social benefits) they should be the target group. Nonetheless, the bottom five deciles confirm that the proposed policy intervention is properly targeted towards the poorest members of the Croatian society.

4. Conclusion

The stated main goal of the paper – microsimulation of the effects of establishing the PSC on the household level – was fulfilled. For the first time, the calculation of incentivising pensioners' return to the workforce by simulating standard student wage rates per hour on the household incomes of retired people was presented. The exercise proved that both total market income and mean household income by decile groups increased, while all poverty indices decreased. In addition to that, inequality indices decreased thus confirming the stated hypothesis that a smart public intervention (establishment of the PSC) aimed at re–activating pensioners can decrease inequality levels. The paper reports the following results that can be of use for public policy implementation. First, market income was identified as the main cause of income inequality. Thus, activating pensioners' willingness to work is a direct channel which reduces both inequality and poverty. Second, microsimulation enables targeting the exact group of pensioners which opens up possibilities to expand coverage and effects (e.g. to increase the maximum amount pensioners can earn). Third, the state can decrease its allocations for benefits such as heating costs, housing, guaranteed minimum benefits, etc. for those pensioners who can earn enough money to cover those costs themselves (this is then a clear opportunity cost of government funds). Fourth, pensioners have a clear monetary incentive to increase their labour supply.

The paper does not claim that this should be the only public policy approach or that this should be made mandatory for all pensioners. Pensioners' impaired health conditions, skills mismatch and employers' preferences also play a critical role in observing whether the final results will follow the results of this simulation. Namely, the paper takes into account the ageing population, labour market shortages and the results from SENIOR 2030 focus interviews and presents the first microsimulation of these effects on the household level in Croatia.

Limitations of the study stem from the fact that this is the first such study since microsimulation is performed with the aim of improving tax and benefits of the social system, while pensions are outside its scope and focus. Thus, fine-tuning is possible (e.g. including costs of the PSC) to get the costs of the programme and not just the benefits. This is also a promising research avenue that can be expanded by simulating other work arrangements (mentorship contracts and other sources of part–time contracting) that fit under the tax and contribution schemes of the government. This could in return yield higher estimated effects of the proposed reforms. Living in a time of labour shortages, ageing and the unsustainability of the pension insurance system, reforms are a necessity. We hope that this idea could also contribute to the betterment of the society.

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