

Self-Perceived Financial Sufficiency of the Elderly Population in Croatia

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Subjective income, as measured by self-perceived financial sufficiency, is a critical determinant of well-being, including an individual's health and quality of life. This study investigates self-perceived financial sufficiency among the elderly population in Croatia and its demographic and socioeconomic correlates, drawing on data from a 2022 survey conducted as part of the SENIOR2030 project. Our findings reveal significant variations in self-perceived financial sufficiency across Croatian regions, age groups, duration of working life and other socioeconomic factors, with household characteristics playing an important role. Additionally, we found that objective income is positively associated with self-perceived financial sufficiency among the elderly in Croatia. As Croatia's population ages and single-person households become more prevalent, understanding how the elderly perceive their financial status and its impact on their quality of life is becoming increasingly important. While objective and subjective measures of income differ, both have significant and sometimes diverse effects on behaviour and well-being. Research surveys often use questions about self-perceived financial sufficiency, providing valuable insights for informing public policies aimed at improving the well-being of the elderly population. Our findings contribute to the growing literature on the importance of subjective measures of income and their relationship with well-being among the elderly with some comparable results identified in other European countries.

Keywords: subjective income, elderly population, socio-economic characteristics.

JEL classification: C13, C83, J14.

INTRODUCTION

Individual income, as an indicator of the general well-being and wealth of a society or a group, is a better indicator than many aggregates or per-capita indicators that have been widely used as a repre-

sentation of group well-being (Pischke, 1995). Individual income can be measured by different metrics, yet nominal monetary value for a given time frame (most often annually income) became a standard approach in literature. However, given the

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rising complexity of our consumption patterns, debt availability and our perception of income relative to other, new approaches to measuring personal income have been developed and subjective data could fulfil various goals in economic literature (Senik, 2005). One of those approaches is a measure of subjective income.

Subjective income can be measured in terms of the financial sufficiency of individuals. Self-perceived financial sufficiency is an individual's perception of meeting their own needs. This approach alleviates the objective, typically monetary, a measure of financial sufficiency which is regularly measured through satisfying minimal monthly or annual income levels required for sustaining the basic human needs in modern societies.

The main goal of our paper is to study the current levels of self-perceived financial sufficiency of the elderly population in Croatia and main demographic and socioeconomic correlates of self-perceived financial sufficiency among the elderly population in Croatia.

In general, literature on this topic is still rather exploratory. There are no comparable studies on this topic in Croatia. More specifically, the literature on income distribution among demographic and socioeconomic groups in Croatia is scarce.

Our focus does not lie in the absolute levels of income needed for self-sufficiency. Rather, we are interested in understanding the demographic, socioeconomic and regional factors of self-perceived financial sufficiency. This self-perceived financial sufficiency is a personal assessment of individual (objective) income and individual expenses. These expenses ought to be minimal expenses for sustaining an individual in their evaluation of the quality of life standards. Subjective measures reflect economic utility levels within their budget

limitations (Chan et al., 2002; Tarasenko & Schoenberg, 2017).

Population ageing as an important demographic process of contemporary societies led to profound changes in the age structure and economic systems across developed countries. The share of the elderly population is rising and demographic projections expect it to continue increasing (Lutz et al., 2008; Vaupel et al., 2021).

Understanding income distribution and underlying factors of inequality and poverty in certain population groups is a prerequisite for the development of effective public policies. In the case of the income of the elderly population, we have a particular interest in poverty levels and the risk of social exclusion resulting from poverty. However, the very definition of poverty varies among the scientific, professional and administrative frameworks (Rakodi, 1995).

Measures of personal income have been a debated topic in the last decades of economic literature. In practical terms, the definition of income results in tax burden, transfer of income and public policies in general. The income concept is constructed without a universal or widely shared conception of income, resulting in numerous definitions, concepts and norms (Brooks, 2018).

In economic literature, aggregate personal (per capita) income has been a widely used measure of individual income. However, with the new methods of data collection and processing, more micro-data approaches have been developed and utilized in research. Research based on surveys and individual-level administrative data has proven to give valuable insight into the knowledge of complex relationships between income and other socioeconomic or demographic variables (e.g. age, gender, education, family and household backgrounds). Moreover, ag-

gregate per capita income does not inform us of income distribution in a population.

Individual measures of income can be objective or subjective. Objective measures of income are often defined through income brackets of nominal monetary value. However, subjective income measures are gaining research interest since self-perceived or subjective income can affect our individual preferences and behaviour differently from the actual objective measure of our income (Ackerman & Paolucci, 1983). For instance, subjective measures of income or financial self-sufficiency can affect our health and well-being (Cialani & Mortazavi, 2020; Muhammad et al., 2021; Tarasenko & Schoenberg, 2017). Also, subjective income and its effects on subjective well-being are highly dependent on comparison with other people and our relative position to our surroundings (Tibesigwa et al., 2016). Other aspects of personal finances, such as financial literacy, also differ between subjective and objective measures. It has been found that the perception of financial knowledge is different (greater) from actual knowledge on the topic (LaBorde et al., 2013). Our current income also affects future or expected subjective income (Dominitz & Manski, 1997). Similar to subjective income, subjective socioeconomic status (SES) showed to be a better predictor of individual health than objective status (Singh-Manoux et al., 2005).

Despite the recent rise in research interest, disparities between subjective and objective income and its effect on various aspects of human behaviour, preferences and life outcomes require further research. Subjective income or self-perceived financial sufficiency is of particular interest in vulnerable groups or populations in the lower part of the income distribution. Therefore, the elderly population was a key interest in our study focus.

Based on the main goal of the paper and the scope of our research we formed two **research questions**:

1. Is objective income linked to self-perceived financial sufficiency among elderly people in Croatia?
2. Does self-perceived financial sufficiency differ based on an individual's basic sociodemographic characteristics (age, gender, education, working life, region and others) among elderly people in Croatia?

To address these research questions, which are of exploratory nature in the field of subjective income among the elderly population in Croatia, we focused on identifying the main demographic and socio-economic correlates of individual subjective income from survey-based data.

Surveys often employ a question on whether an individual (or household) could afford an unexpected financial expense (for example, surveys *EU Statistics on Income and Living Conditions (EU-SILC)* and *Survey of Health, Ageing and Retirement in Europe (SHARE)* for Europe or *Survey of Income and Program Participation (SIPP)* and *Survey of Household Economics and Decision making (SHED)* for the United States) as a form of subjective self-sufficiency or disposable income. However, some surveys use a more direct approach by employing literate question(s) on self-perceived self-sufficiency or subjective income. Those include measuring income on a scale from very good to very bad or questions like "How much money do you (or your household) need to meet your needs?", which is a representation of the "Minimum income question" concept which was a standard subjective measure for decades (Garner & de Vos, 1995). However, question-wording like minimum income question or minimum spending question could play an important

factor in the following results (Garner & Short, 2003). Questions on self-perceived financial sufficiency usually have a lower share of non-response than the questions on actual income (for example, see Tarasenko & Schoenberg, 2017).

Population ageing is an ongoing and socially powerful process in Croatia (Wertheimer-Baletić, 2004), with a high level of public presence. Population ageing combined with emigration waves led to a significant change in the population size and structure in Croatia, with an unprecedented share of the older population and a tendency to increase (Akrap & Ivanda, 2019). Population ageing is a leading cause of concern for the social security systems among developed countries. Ageing presents a major challenge in both the financial and operational levels of social security systems. Croatia, as a country with severe levels of population ageing, is expected to witness the consequences of population ageing in the following decades. Thorough reform activities have been suggested to cope with the challenge of population ageing in Croatia. Foremost, the reforms in pension and health care systems, elderly care and active ageing are expected to be the main focus of activities in tackling the effects of population ageing (Puljiz, 2016).

Despite the low income of the elderly population in Croatia, the elderly population is both on the giving and receiving end of financial and material transfers. The older population in Croatia is a significant caregiver and provider of financial and material transfers both to the old and young(er) populations in Croatia (Strmota & Ivanda, 2015). Personal finances and income by age groups in Croatia have not been researched on a basis of socio-economic characteristics and on a micro-level approach. However, we know that patterns of consumption vary by age and that the

elderly population in Croatia does have a different consumption structure than the young population (Ivanda & Strmota, 2021).

Recent comparable and systematic research on the topic of subjective income among European countries has been conducted by Želinský et al., (2022). The study shows that subjective income data in EU countries capture societal changes not represented in official objective income data. The most important finding is a decrease in subjective poverty across the EU. Furthermore, the study showed a correlation between household characteristics and subjective poverty in the EU, yet results for Croatia were inconclusive (Želinský et al., 2022). Similar to our study focus, a recent Belgian study showed the importance of objective income and socio-economic characteristics with an emphasis on the importance of homeownership on subjective sufficiency (Castro & Bleys, 2023). Also, literature on self-perceived financial sufficiency of the elderly indicates that relatively low levels of income seem to be enough for the elderly population to feel financially sufficient (Stoller & Stoller, 2003).

Trends in European countries indicate that income distribution among age groups changed in favour of the older population - income of the younger population stagnated or declined after 2008, while the income of the older population increased, mostly due to an increase in public pensions and higher employment among the older population (Hammer et al., 2022). The main source of personal income for the elderly is the pension, yet there is a significant proportion of the elderly in Croatia without a pension income. This population has low levels of quality of life, and those living in single households are particularly affected (Šučur, 2008). The Croatian pension system has seen several reforms and

changes since Croatian independence with the major one in 2002 which introduced mandatory private savings in the form of mandatory allocation for individualized capitalized savings (5% of gross salary). Actual pension system model in Croatia, after its major reform in 2002, is a topic of scientific and public debate, yet we are lacking in empirical evidence on its performance (Bežovan, 2019). However, the Croatian pension system along with financial stability issues has issues in terms of a low share of old-age pensions. The high share of other types of pensions (disability pensions, family pensions and early-retirement pensions) is an ongoing characteristic of the Croatian pension system. Almost one-quarter of all pensions in Croatia are disability pensions. However, that share is steadily declining, mostly due to institutional changes that affected the corruption linked to the part of disability pensions (Bađun, 2017). In long term, changes in the structure of Croatian pensions should improve pension adequacy in Croatia. The pension system in Croatia with its performance in terms of low pension adequacy levels provides a good setting for exploring the subjective levels of the personal finances of the elderly. Studies have shown that understanding and researching subjective income (or self-perceived financial sufficiency) is interesting and useful, which is especially true for

underrepresented populations (Tarasenko & Schoenberg, 2017).

DATA AND METHODS

Data for this study is based on a survey among the elderly population in Croatia. The survey was undertaken within the project “Senior 2030 - Thematic Network for Active Ageing Policy in Croatia”. The survey was conducted in January 2022 and the target population were the citizens of Croatia aged 65 years or more. Quota random sampling was applied. The quota approach is based on the Croatian Census conducted in 2011, where the structure of citizens aged 65 or more was observed according to gender and NUTS 2 regions in Croatia. It has to be emphasized that the most recent Croatian Census was conducted in 2021. However, the new census data were not available in January 2022, when the survey was conducted, and therefore the data from the Croatian Census conducted in 2011 had to be used. So, in the first step, households were randomly selected. If there was more than one eligible person in a household, in the second step one of them was chosen randomly. The distribution of respondents in the sample according to the age groups, gender and NUTS 2 regions in Croatia in the sample is shown in Table 1.

Table 1
Distribution of respondents according to the age groups, gender and NUTS 2 regions in Croatia

NUTS 2 Region	Age group								Total
	65-69		70-74		75-79		80 and more		
	Male	Female	Male	Female	Male	Female	Male	Female	
City of Zagreb	11	20	9	24	11	19	18	14	126
Adriatic Croatia	37	48	27	41	20	28	15	23	239
Pannonian Croatia	32	52	18	34	17	22	9	20	204
Northern Croatia	22	26	12	32	8	17	7	8	132
Total	102	146	66	131	56	86	49	65	701

In order to collect the data, a computer-assisted telephone interviewing (CATI) method was applied. The research aimed to collect different information about the well-being of older people in Croatia as a good base for further improvements in the quality of elderly people’s lives. Therefore, the questionnaire covered different topics related to the health, transport possibilities, etc. of older people. However, in this paper, the focus will be given to the income segment of elders’ life only.

In that way, the main (dependent) variable under the study is the Sufficient level of resources to meet the basic living needs of the elderly person (Sufficient). The variable is binary with a value of 1 if a respondent confirms that he has a sufficient level of resources to meet his basic living

needs. In case a respondent states that he does not have a sufficient level of resources to meet his basic living needs, the value of the main variable will be equal to zero.

In addition to the variable Sufficient, according to the theoretical background and conducted primary research, additional 9 variables will be observed in the paper. The list of additional explanatory variables with brief explanations is given in Table 2. Due to the fact that all explanatory variables are categorical ones, for analysis purposes, the categories of each explanatory variable were coded with discrete numerical values. Microsoft Excel software was used for editing collected survey data, whereas Stata software was used for data analysis.

Table 2
Observed explanatory variables

Variable code	Variable	Variable categories
NUTS2	Respondents' residence according to NUTS2 regions in Croatia	Four levels: City of Zagreb; Adriatic Croatia; Pannonian Croatia; Northern Croatia
Age	Respondents' age	Four levels: 65-69; 70-74; 75-79; 80 and more
Gender	Respondents' gender	Two levels: male; female
Settlement	Form of settlement where respondents are living	Two levels: urban settlement; non-urban settlement
Household	Number of household members	Four levels: 1; 2; 3; 4 and more
HouseholdI	Number of household members with income	Four levels: 1; 2; 3; 4 and more
Education	The highest level of education completed	Four levels: without education or unfinished primary school; completed primary school; completed high school; completed a higher level of education
Income	Personal income of respondents	Six levels: 132.72 EUR or less; 132.86-265.45 EUR; 265.58-398.17 EUR; 398.301-530.89 EUR; 531.02-663.61 EUR; 663.75 EUR or more*
Work	Years of respondents' work experience	Two levels: less than 35; 35 and more

Note: *During the survey period official currency in Croatia was the Croatian kuna (HRK). However, from January 1, 2023, the official currency in Croatia is the euro (EUR). Therefore, the values given in HRK are recalculated in EUR by using the official conversion rate of 7.53450 HRK per 1 EUR (Council regulation (EU), 2022/1208). In the original questionnaire the levels were: 1000 HRK or less; 1001-2000 HRK; 2001-3000 HRK; 3001-4000 HRK; 4001-5000 HRK; 5001 HRK or more. Subjective income in EUR does not have to coincide with subjective income in HRK. Therefore, this study should represent the subjective income in the period when the field questionnaire was conducted.

In the analysis part of the paper, in the first step, the main variable under the study (Sufficient) will be inspected using basic descriptive statistics methods. Also, the relationships between the variable Sufficient and other explanatory variables will be observed. In this way, the main variable will be better known and more information on the relationship with other variables under the study will be gained.

In the second step, binary logistic regression analysis will be conducted. In the logistic regression model, the dependent variable is going to be variable Sufficient. In logistic regression modelling, two approaches will be applied. In the first approach, all observed explanatory variables will enter the model as independent variables. As opposed to the enter approach, the forward stepwise approach

will be used as well because there was no previous similar research, so it is unknown which of the explanatory variables are expected to be reliable predictors. In interpreting binary logistic regression analysis results, emphasis will be given to the odd ratio values. The odds ratio represents the comparison of the odds that the explanatory variable takes a specific value across two levels of the main (dependent) variable (Heeringa et al., 2010). An odds ratio greater than 1 indicates that the condition or event is more likely to occur at the units with certain characteristics than at the units with the reference characteristic. Furthermore, the overall correct classification of the units in the sample by the estimated binary logistic models will be observed as well.

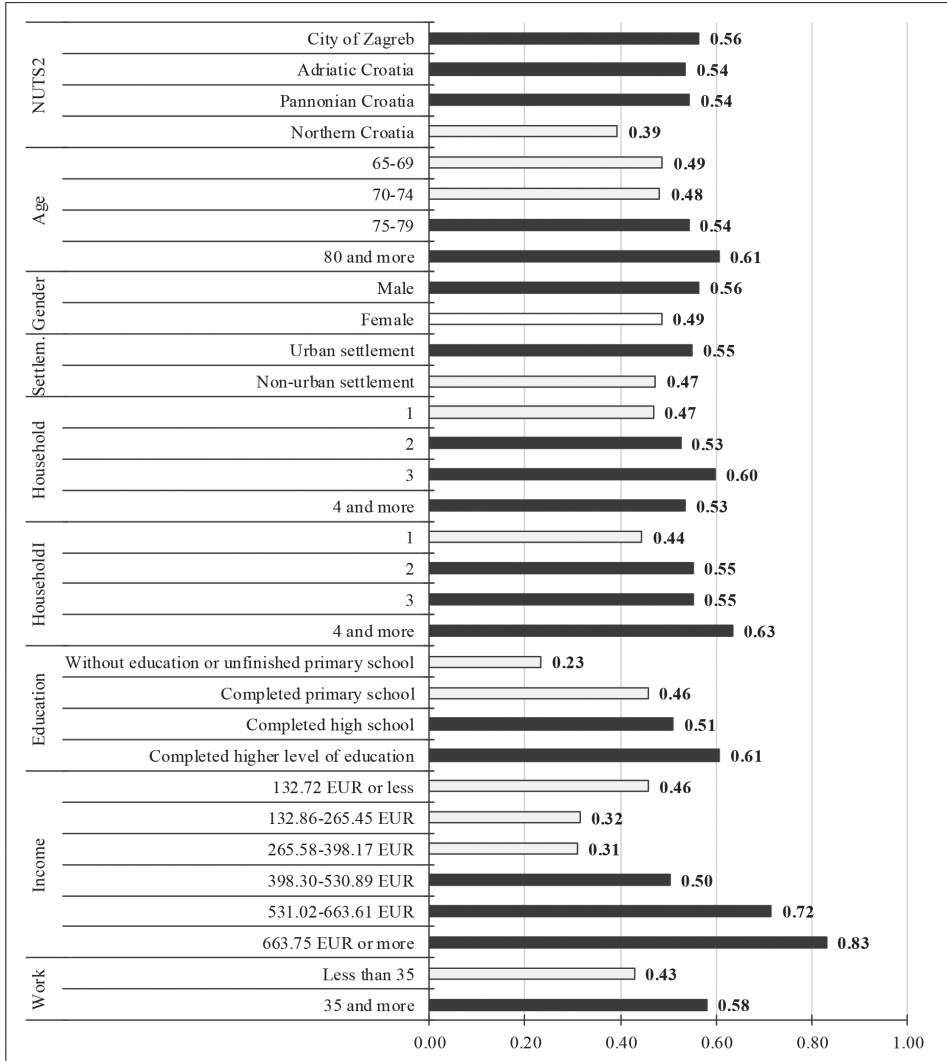
RESULTS

Descriptive statistics analysis

701 respondents participated in the survey overall, and 51.64% of them stated that they have a sufficient level of resources to meet their basic living needs. Roughly speaking, it turned out that half of the

respondents have and the other half of respondents do not have sufficient levels of resources to meet their basic living needs. Therefore it would be more interesting to inspect the situation in more detail regarding the sufficiency of resources according to selected explanatory variables.

Figure 1
Share of respondents who have a sufficient level of resources to meet their basic living needs across the observed explanatory variables



In Figure 1, the share of respondents who have sufficient levels of resources to meet their basic living needs across the observed explanatory variables is shown. The black columns in Figure 1 are emphasizing that the majority of respondents in certain categories have sufficient levels of resources to meet their basic living needs. If respondents are observed according to the NUTS2 region where they live, it can be concluded that only in Northern Croatia the share of respondents who have a sufficient level of resources to meet their basic living needs is below 50%. The results at the explanatory variable Age are suggesting that the older respondents are, the higher the share of those who have a sufficient level of resources to meet their basic living needs. The shares of respondents who have sufficient levels of resources to meet their basic living needs in age categories 65-69 and 70-74 are slightly under 50%, 49% and 48% respectively. The share of male respondents who have sufficient levels of resources to meet their basic living needs is 56% whereas the share of female respondents who have sufficient levels of resources to meet their basic living needs is 49%. Furthermore, 55% of respondents who live in urban settlements have sufficient levels of resources to meet their basic living needs whereas 47% of the respondents who live in non-urban settlements have sufficient levels of resources to meet their basic living needs. Only

households with only one member and households in which only one member has an income have, in the majority, more respondents who do not have a sufficient level of resources to meet their basic living needs. With an increase in education level, the share of respondents who have sufficient levels of resources to meet their basic living needs is increasing. So, the share of respondents without education or unfinished primary school who have a sufficient level of resources to meet their basic living needs is only 23%. On the other hand, the share of respondents with a completed higher level of education that have a sufficient level of resources to meet their basic living needs is 61%. In categories in which respondents have an income higher than 398.17 EUR the share of respondents that have a sufficient level of resources to meet their basic living needs is above 50%, whereas in categories in which respondents have an income of 398.17 EUR or lower than 398.17 EUR, this share is below 50%. Finally, in the category where respondents worked for 35 years or more the share of respondents who have a sufficient level of resources to meet their basic living needs is above 50% and it is equal to 58%. Unfortunately, in the category where respondents worked less than for 35 years the share of respondents who have a sufficient level of resources to meet their basic living needs is only 43%.

Table 3
Chi-square test results of the relationship between variable Sufficient and the observed explanatory variables, n=701

Explanatory variable	Chi-square value	Degrees of freedom	p-value
NUTS2	10.025	3	0.018
Age	5.712	3	0.126
Gender	4.073	1	0.044
Settlement	3.909	1	0.048
Household	4.287	3	0.232
HouseholdI	9.639	3	0.022
Education	23.600	3	<0.001
Income	117.822	5	<0.001
Work	15.643	1	<0.001

In Table 3 the results of Pearson’s chi-square test of the independence of two categorical variables are given. In all cases, the chi-square test included the variable Sufficient and one of the explanatory variables. According to the results from Table 3, it can be concluded that at a significance level of 0.05, there is a significant association between the variable Sufficient and, individually observed, the following explanatory variables: NUTS2; Gender; Settlement; HouseholdI; Education; Income; and Work. It appears that the variable Sufficient does not have a significant association with the variable Age and with the variable Household.

Binary logistic regression analysis

The main variable under study is the variable Sufficient which is a binary variable with values of insufficient level of resources to meet basic living needs (0) and sufficient level of resources to meet basic living needs (1). Therefore two binary logistic regression analyses were conducted. In the first binary logistic regression analysis the enter method was applied and all observed explanatory variables were included in the model. On the other hand, in the second binary logistic regression analysis, the forward stepwise likelihood ratio method was applied for the selection of observed explanatory variables that were going to enter the model. The results of the first binary logistic regression model are given in Table 4, whereas the results of the second binary logistic regression model are provided in Table 5.

Table 4

Estimated binary logistic regression model for dependent variable Sufficient, n=701, all explanatory variables included

Predictor ^a	Category	$\hat{\beta}$	se($\hat{\beta}$)	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
INTERCEPT	Constant	0.279	0.565	1.322	0.437	3.996
NUTS2	City of Zagreb	-0.130	0.263	0.878	0.524	1.470
	Northern Croatia	-0.598*	0.256	0.550	0.333	0.909
	Pannonian Croatia	0.333	0.219	1.395	0.908	2.141
Age	70-74	-0.018	0.214	0.982	0.645	1.496
	75-79	0.240	0.242	1.271	0.792	2.041
	80 and more	0.585*	0.274	1.796	1.050	3.073
Gender	Male	-0.208	0.192	0.812	0.558	1.183
Settlement	Urban settlement	-0.195	0.194	0.823	0.563	1.204
	2	-0.873*	0.418	0.418	0.184	0.948
Household	3	-0.314	0.568	0.730	0.240	2.222
	4 and more	-0.750	0.576	0.472	0.153	1.461
Householdl	2	1.169**	0.405	3.219	1.456	7.115
	3	0.747	0.562	2.110	0.701	6.349
	4 and more	1.411*	0.668	4.098	1.107	15.177
Education	Completed higher level of education	-0.164	0.211	0.849	0.561	1.282
	Completed primary school	0.124	0.298	1.132	0.632	2.029
	Without education or unfinished primary school	-0.864*	0.408	0.422	0.190	0.938
Income	132.86-265.45 EUR	-1.074*	0.512	0.342	0.125	0.933
	265.58-398.17 EUR	-1.087*	0.495	0.337	0.128	0.889
	398.30-530.89 EUR	-0.238	0.509	0.788	0.291	2.139
	531.02-663.61 EUR	0.596	0.539	1.815	0.631	5.219
	663.75 EUR or more	1.473**	0.550	4.362	1.484	12.823
Work	Less than 35	-0.054	0.201	0.947	0.639	1.404

Note: $R^2=0.203$ (Cox & Snell), $R^2=0.270$ (Nagelkerke). Model $\chi^2(23)=158.82$, $p<0.001$. * $p<0.05$, ** $p<0.01$.

^a Reference categories: NUTS2 (Adriatic Croatia); Age (65-69); Gender (female); Settlement (non-urban settlement); Household (1); Householdl (1); Education (completed high school); Income (132.72 EUR or less); Work (35 and more).

According to the results from Table 4, it can be concluded that an elderly person who lives in the City of Zagreb has a reduction of 12.2% in the odds (odds ratio = 0.878) of having a sufficient level of resources to meet basic living needs compared to an elderly person who lives in Adriatic Croatia. An elderly person who lives in Northern Croatia has a reduction of 45% in the odds (odds ratio = 0.550) of having sufficient levels of resources to

meet basic living needs compared to an elderly person who lives in Adriatic Croatia. On the other hand, an elderly person who lives in Pannonian Croatia has an increase of 39.5% in the odds (odds ratio = 1.395) of having a sufficient level of resources to meet basic living needs compared to an elderly person who lives in Adriatic Croatia. Older people tend to have higher odds of having sufficient levels of resources to meet basic living needs. Similarly, fe-

males seem to have higher odds of having sufficient levels of resources to meet basic living needs in comparison to males. As expected, an elderly person with a higher income has higher odds of having sufficient levels of resources to meet basic living needs compared to an elder person

with a lower income. An elderly person who worked for less than 35 years has a reduction of 5.3% in the odds (odds ratio = 0.947) of having sufficient levels of resources to meet basic living needs compared to an elderly person who worked for 35 years or more.

Table 5
 Classification table for estimated binary logistic regression model for dependent variable Sufficient, n=701, all explanatory variables included

Classified	True		Total
	Have sufficient levels of resources to meet basic living needs	Do not have sufficient levels of resources to meet basic living needs	
Have sufficient levels of resources to meet basic living needs	241	90	331
Do not have sufficient levels of resources to meet basic living needs	121	249	370
Total	362	339	701

In Table 5 the classification table of units in the sample according to the estimated binary logistic regression model is shown. In the sample, there were 362 elderly persons who had sufficient levels of resources to meet basic living needs, whereas 339 elderly persons did not have sufficient levels of resources to meet basic living needs. Based on the estimated binary logistic regression model there were 331 elderly persons who had and 370 elderly persons who did not have sufficient levels of resources to meet basic living

needs. So, the estimated binary logistic model successfully classified 66.57% of elder persons who had sufficient levels of resources to meet basic living needs (241/362). On the other hand, 73.45% of elderly persons who did not have sufficient levels of resources to meet basic living needs (249/339) were successfully classified by the estimated binary logistic model. Accordingly, the overall correct classification level of the estimated binary logistic model is 69.90% ((241+249)/701).

Table 6

Estimated binary logistic regression model for dependent variable Sufficient, $n=701$, forward stepwise likelihood ratio method

Predictor ^a	Category	\hat{B}	se(\hat{B})	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
INTER-CEPT	Constant	-0.058	0.430	0.944	0.406	2.192
NUTS2	City of Zagreb	-0.058	0.247	0.943	0.581	1.532
	Northern Croatia	-0.447	0.243	0.640	0.397	1.029
	Pannonian Croatia	0.277	0.211	1.319	0.873	1.993
Income	132.86-265.45 EUR	-0.735	0.474	0.479	0.189	1.214
	265.58-398.17 EUR	-0.746	0.445	0.474	0.198	1.134
	398.30-530.89 EUR	0.099	0.447	1.105	0.460	2.654
	531.02-663.61 EUR	0.957*	0.470	2.604	1.037	6.538
	663.75 EUR or more	1.702**	0.479	5.484	2.145	14.022

Note: $R^2=0.173$ (Cox & Snell), $R^2=0.231$ (Nagelkerke). Model $\chi^2(8)=133.11$, $p<0.001$. * $p<0.05$, ** $p<0.01$.

^a Reference categories: NUTS2 (Adriatic Croatia); Income (132.72 EUR or less).

In the estimated binary logistic regression model with applied forward stepwise likelihood ratio method variable Income entered in the first step and variable NUTS2 in the second step. According to the results from Table 6, the odds ratio values at variable Income are revealing that with an increase in income at the same time, the odds of having a sufficient level

of resources to meet basic living needs are increasing in comparison to an elder person who has income 132.72 EUR or less. Observed from the perspective of variable NUTS2, it seems that an elderly person who lives in Pannonian Croatia has the highest odds of having a sufficient level of resources to meet basic living needs.

Table 7

Classification table for estimated binary logistic regression model for dependent variable Sufficient, $n=701$, forward stepwise likelihood ratio method

Classified	True		Total
	Have sufficient levels of resources to meet basic living needs	Do not have sufficient levels of resources to meet basic living needs	
Have sufficient levels of resources to meet basic living needs	233	107	340
Do not have sufficient levels of resources to meet basic living needs	129	232	361
Total	362	339	701

In Table 7, the classification table of units in the sample according to the estimated binary logistic regression model with the reduced number of independent variables is shown. This estimated binary logistic model successfully classified 64.36% of elderly persons who had sufficient levels of resources to meet basic living needs (233/362) and 68.44% of elderly persons who did not have sufficient levels of resources to meet basic living needs (232/339). Therefore, the overall correct classification level of the estimated binary logistic model is 66.33% $((233+232)/701)$. The correct classification result here is a little bit lower than was achieved in the full binary logistic regression model (69.90%). However, the second estimated binary logistic regression model, with only two independent variables included, is much simpler than the full estimated binary logistic regression model.

DISCUSSION AND LIMITATIONS

Literature on this topic often seeks applicability: practical solutions in public policies or strategies for dealing with impoverishment are based on research that tackles the issue of individual income.

In the introductory part of the paper, we presented findings that show how subjective income can affect various aspects of our lives and well-being (e.g. health) regardless of objective income. Comparing ourselves to others or simply comparing our consumption levels to our expectations can trigger different behavioural, emotional or other processes.

To discuss the results in terms of our research questions, we should focus both on what the results showed and on the limitations of the research. The first research question was clearly addressed in our results: an individual's objective income was positively correlated with self-per-

ceived financial sufficiency. In terms of the second research question, we showed that differences in self-perceived financial sufficiency among Croatian regions exist and that age, education and household composition play a role in the probability of being financially sufficient.

Our research shows that a higher level of objective income and education, having a longer working life, living in urban settlements and in households with member(s) with income increases the odds of feeling financially self-sufficient for the elderly population in Croatia. Furthermore, our results on regional differences that show that more economically prosperous regions of Croatia had lower levels of individuals who feel self-sufficient could be interpreted along with the findings from Castro, D. & Bleyss, B. (2023) which show that individuals with higher income need more to feel financially self-sufficient. The results of our statistical modelling are not powerful enough to fully support those connections because of a high number of non-significant variables or categories. However, descriptive statistics provided expected results which coincided with the presented existing research on the topic of both subjective and objective income.

Results on household composition play an important role in the applicability aspect of this study since the household structure in developed countries is changing rapidly. The rise in single households during the last century in developed countries is unprecedented in human history and several social and demographic changes are responsible for that transition (Kreider & Vespa, 2014; Lesthaeghe, 1983). Growth in the share of single households, among other factors, is especially driven by the rise in life expectancy. Our longevity has been, with some discontinuities, firmly rising and is expected to continue to rise up to a certain limit, which is a cause of

scientific debate and research (Vaupel et al., 2021). Therefore, we can expect the continuity of population ageing and a potential rise in single-households across developed countries. Hereby, we emphasize that subjective income and corresponding effects should play a more important role in public policies aimed at eliminating social exclusion and improving the quality of life in the elderly population. Household size and composition play an important role in alleviating numerous risk factors of social exclusion, albeit with certain factors that drive the effect in a different direction. For example, household size can have a negative effect on an individual's poverty, especially in cases with members in need of care or financial support, either children, the elderly or any other type of supported member. Contrarily, single households among the elderly population are connected with a higher risk of poverty and social exclusion. Therefore, research on household size and poverty should emphasize other socioeconomic variables and household structure (Fusco & Islam, 2020; Lanjouw & Ravallion, 1995). As expected, our results show that households with a higher number of members with income play a positive effect on subjective income. On the contrary, our models did not show the household size to be a significant variable and descriptive statistics showed differences after a threshold is reached (three-member household). However, more research is needed to address these conclusions due to the heterogeneity of households within socioeconomic status and the complex nature of household composition on multigenerational transfers and personal or household finances.

Our approach has certain limitations. Firstly, as in comparable research, we deal with the concept of subjective income that is not standardised in literature. Various methodological approaches in measur-

ing and defining subjective income lead to relatively weak comparability among the already small body of research. Our measure of subjective income is based on a single question in the research questionnaire. Also, subjective income is based on a concept of self-sufficiency: does the person have enough financial resources to meet basic living needs. Therefore, the question of measuring subjective income is a binary question, which leaves out a gradation (scale) of subjective income. The definition of meeting the "basic living needs" is totally up to the perception of the person answering the questionnaire.

Secondly, the population in question already shows a bias in the representation of socioeconomic groups. Most notably, we can see that the population with high(er) education is overrepresented in the sample, whereas other groups are underrepresented. We argue that most deprived and socially excluded groups (social exclusion is positively correlated with age) are underrepresented in this sample. This objection does not necessarily affect the main findings of this analysis, yet we argue that some socioeconomic groups that could be of interest in this topic are left out. Further research on this topic should emphasize methodological issues in defining and measuring subjective income.

Social policies affecting the elderly could be improved by including additional insights based on research on subjective data since a significant body of literature points to the important effects of subjective income on personal well-being and health. Literature shows that we compare our income with our peers, family and general social surroundings and construct our expectations and satisfaction based on it. Therefore, objective measures of income do not capture our subjective perspective which is the actual driver of our behaviour and life outcomes. Based on

our results, we suggest two key points to focus on in social and economic policies towards elderly people – decreasing the share of elderly people with subpar levels of objective income through various financial support measures and increasing the economic activity (working age) of the population before retirement.

CONCLUSION

Self-perceived financial sufficiency of the elderly population in Croatia is a topic of growing importance due to the confirmed effect on health, social activities and quality of life of elderly people. Perception of our financial status determines our abilities and will to participate in social activities and maintain social links in old age. We argue that subjective income plays a vital role in active ageing and is a vital variable in studying the social exclusion of elderly people, especially those in single households. However, literature on subjective income, such as self-perceived financial sufficiency, is scarce. Our explorative study on this topic in Croatia showed that self-perceived financial sufficiency varies among regions, age groups and several socioeconomic variables. More importantly, our results emphasize the importance of household composition: members with income increase the probability of elderly individuals valuing positive personal finances. However, our results indicate that underlying factors of differences between groups are more complex.

This study is based on survey data specifically created for studying social stratification, needs and quality of life of the elderly population in Croatia. Furthermore, this study aims to improve the understanding of subjective measures. Similarly to other studies, we emphasize that methodological differences among studies are a limitation to their comparability as

no standardised measure of subjective income exists. Nevertheless, we emphasize the need for increased attention towards this topic due to the increased need for proactive and effective public policies towards elderly people in Croatia.

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Sažetak

FINANCIJSKA DOSTATNOST STARIJEG STANOVNIŠTVA U HRVATSKOJ PREMA VLASTITOM OPAŽANJU

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Subjektivni dohodak, mjerena prema vlastitom opažanju o financijskoj dostatnosti, ključna je odrednica dobrobiti uz zdravlje i kvalitetu života pojedinca. Ovaj rad istražuje financijsku dostatnost prema vlastitom opažanju starijeg stanovništva u Hrvatskoj i njezine demografske i socioekonomske korelacije na temelju podataka iz istraživanja provedenog 2022. godine u sklopu projekta SENIOR2030. Rezultati ukazuju na značajne varijacije u financijskoj dostatnosti prema vlastitom opažanju diljem hrvatskih regija, dobnih skupina, duljine radnog staža i drugih socioekonomskih čimbenika, a karakteristike kućanstva imaju bitnu ulogu. Uz to, pokazalo se da je objektivni dohodak pozitivno povezan s financijskom dostatnošću starijeg stanovništva u Hrvatskoj prema vlastitom opažanju. Kako stanovništvo Hrvatske stari a samačka kućanstva prevladavaju, sve je važnije razumjeti kako starije osobe shvaćaju svoje financijsko stanje i njegov učinak na kvalitetu njihova života. Iako se objektivne i subjektivne mjere dohotka razlikuju, obje imaju značajne i ponekad različite učinke na ponašanje i dobrobit. Istraživanja često koriste pitanja o financijskoj dostatnosti prema vlastitom opažanju, pružajući dragocjen uvid za javne politike usmjerene na poboljšanje dobrobiti starijeg stanovništva. Rezultati našeg istraživanja doprinose rastućoj literaturi o važnosti subjektivnih mjera dohotka i njihovoj povezanosti s dobrobiti starijeg stanovništva uz neke usporedne rezultate koji su identificirani u drugim europskim zemljama.

Ključne riječi: subjektivni dohodak, starije stanovništvo, socioekonomske karakteristike.