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# Poverty, the worst form of violence: perceived income adequacy among Croatian citizens

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## ABSTRACT

The article analyses to what extent individual's socio-demographic and economic characteristics relate to citizens' perceived difficulty of living on present income. The analysis is carried out by using ordered logit and partial proportional odds (P.P.O.) model on European Social Survey (E.S.S.) data. Results confirm that individual's income can be used as an indicator of financial capacity both in general and for retirees as a focus group. Respondents in financial difficulty had to draw in a higher extent on their savings or incur debt to cover living expenses. Respondents with less than a secondary education, in poor health and those dissatisfied with the current state of the economy, were more likely to perceive their income as inadequate. Findings confirm that older respondents are generally more satisfied with their income compared to middle-aged and younger adults. Respondents living with a child/children were more likely to report financial difficulty. On the other hand, result suggest that gender, region and living area had no significant effect on income adequacy perception. We see similar results when focusing on retired respondents. Individual determinants are significant predictors of citizens' perceived financial difficulty and should be taken into account when devising economic policy measures and legal framework for personal insolvency procedures.

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## JEL CLASSIFICATION

D14; K35

## 1. Introduction

Unfavourable economic conditions and negative demographic changes have highlighted the existing financial worries of citizens living in transitional countries such as Croatia. This phenomenon is even more pronounced in countries with high levels of income inequality and pronounced ageing of population. According to Croatian Bureau of Statistics (2018), Croatia is one of the eight E.U. member states where at least one-fifth of the population is at *risk of poverty*. In 2017, the *risk of poverty* stood at 20% (19.9% in 2016),<sup>1</sup> and when looking at the percentage of citizens *under the risk of poverty or social exclusion* this ratio goes to 26.4% (27.9% in 2016).<sup>2</sup>

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Calculating the ratio between the number of citizens with blocked accounts (319,752)<sup>3</sup> and the working-age population (2,873,828) one can see that 11.13% of working-age inhabitants in Croatia were insolvent in 2017 (Financial Agency, 2017, 2018; Croatian Bureau of Statistics, 2017a, 2017b). By the end of December 2017, 97.47% of total citizens' debt had a maturity longer than one year. The dependency ratio of pension beneficiaries to working population (active insured persons) in Croatia, by the end of 2017, was highly unfavourable at 1 to 1.20 (Ministry of Labour & Pension System, 2017). In the same period, out of the total number of pension beneficiaries, 74.5% received pensions lower than 3.000 H.R.K. (cca 400 EUR).

Aggravated economic conditions and harsh refinancing terms stemming from consequences of global financial crises, caused an increased number of blocked citizens, peaking in recent years. Consequently, a high proportion of the working population and the pension beneficiaries had difficulties in making ends meet. Self-reported ability to make ends meet is known as perceived income adequacy. Other widely used concepts in describing the adequacy of income in satisfying needs refer to subjective economic well-being and financial satisfaction.

The majority of studies on perceived income adequacy were conducted in highly developed countries and only a few focused on emerging economies, such as Croatia. In a short period, Croatia underwent a transition from a socialist to a market based economy. This transition was greatly complicated by a war that caused huge losses to the general economy and caused negative demographic changes. Corruption during the privatisation process further deepened the income inequality and led to deindustrialisation and population impoverishment, which makes Croatia an interesting case to study.

The aforementioned highlights the purpose of this article – to analyse the contribution of individual's socio-demographic and economic determinants in understanding perceived income adequacy of Croatian citizens. In order to understand factors affecting perception of income adequacy in making ends meet among Croatian citizens, this article uses the data from European Social Survey ([E.S.S.] 2020). Obtained results provide better insights into individual characteristics that must be taken into account when developing adequate policy measures for resolving citizen's indebtedness and insolvency. New knowledge regarding the ability of Croatian citizens to meet their financial needs can serve as the basis for formulation of strategies and programmes addressing relief and prevention of individual's financial difficulties.

An additional point of interest includes the perceived income adequacy among the retired population in Croatia. The Croatian population is rapidly aging and moving towards an older population structure, a trend that is apparent in most E.U. countries. The proportion of working-age population is shrinking and at the same time, the number of retired people is significantly increasing, causing a burden on social and health care systems. Increased pension and health care expenditures related to population ageing negatively affect fiscal sustainability. Compared to other E.U. countries this problem is more pronounced in Croatia, since the formation of retired persons, in the last two decades, was not only driven by demographic factors, but was also affected by economic conditions (transition and privatisation) and political events (war during 1990s). The perceived income adequacy among retirees in Croatia

is interesting to address as Croatia was among the five European Union countries with the highest proportion of pensioners at risk of poverty in 2017 (Eurostat, 2019a, 2019b).

## 2. Literature review

Perceived income adequacy represents subjective measure of income and has been found to represent a robust indicator of objective economic status, as well as valid measure of one's financial capacity (Grable et al., 2013; Litwin & Sapir, 2009). It is also addressed in the literature as a measure of subjective well-being (Bartolini, Bilancini, & Sarracino, 2013; Chan, Ofstedal, & Hermalin, 2002; Cracolici, Giabona & Cuffaro, 2014; Cracolici, Giabona, & Cuffaro, 2012; Hazelrigg & Hardy, 1997; Litwin, 2009; Palomäki, 2017, 2019), self-rated economic status (Litwin & Sapir, 2009), subjective income security (Ballantyne & Marshall, 2001) and financial satisfaction (Stoller & Stoller, 2003). Previous studies found perceived income adequacy more meaningful in assessing individual's financial capacity than the actual income. The reason for this is that research participants are reluctant in reporting their true income and are prone to assess the adequacy of their income. In addition, different income streams make it difficult to measure actual income accurately (Li, Chi, & Xu, 2011).

Studies that have addressed perceived income adequacy as the outcome variable examined the influence of different correlates, such as socio-demographic factors, objective economic indicators and health-related variables (Gildner et al., 2019; Hazelrigg & Hardy, 1997, Ballantyne & Marshall, 2001; Hsieh, 2003; Litwin & Sapir, 2009, Litwin, 2009; Palomäki, 2017; Stroller & Stroller, 2003). Depending upon available data, some authors also examined the influence of other predictors, such as family related factors (Chan et al., 2002; Hazelrigg & Hardy, 1997; Li, Chi & Xu, 2011; Stroller & Stroller, 2003), social network variables (Bartolini et al., 2013; Guagnano, Santarelli & Santini, 2016; Litwin & Meir, 2013; Soukiazis & Ramos, 2016), expectations regarding future (Ballantyne & Marshall, 2001; Litwin & Sapir, 2009), attitudes and beliefs (Soukiazis & Ramos, 2016), satisfaction with life (Ballantyne & Marshall, 2001; Soukiazis & Ramos, 2016) and country of residence (Litwin & Sapir, 2009).

Based on the literature review, socio-demographic variables are the most common predictors of perceived income adequacy. Age is usually found to be positively related with perceived income adequacy; older individuals are less likely to report financial difficulties and consider their income to be quite adequate, even when the actual income is relatively low (Ballantyne & Marshall, 2001; Hazelrigg & Hardy, 1997; Litwin & Sapir, 2009; Stoller & Stoller, 2003). This phenomenon in the literature is known as the satisfaction paradox. In a number of studies, reduced income needs among retired elders, was explained by decreased spending on children, higher rates of home ownership and untaxed income (Stroller & Stroller, 2003). However, Bartolini et al. (2013) found a negative association between age and subjective well-being when it comes to German citizens. The divergence from the satisfaction paradox was also found in middle and low income countries, e.g., Gildner et al. (2019) found differences in income adequacy ratings between younger and older adults.

These variations were attributed to the existence of cultural and policy differences that shape perceptions of income adequacy. Younger adults in China and Russia were more likely to report of being income insecure, compared to their older counterparts. On the other hand, opposite pattern was observed in Ghana and India, indicating that older adults were more likely to report income inadequacy. Finally, the authors did not find a significant relationship between age and income adequacy in Mexico and South Africa. The effect of gender on the perceived income adequacy was ambiguous. Ballantyne and Marshall (2001) found that women are less likely to report income insecurity, which contradicts the theory that women's lower income status and higher uncertainty about the future will result in a higher level of income dissatisfaction. Other authors also found that men were less likely to report their income as adequate (Chan et al., 2002; Li et al., 2011; Litwin & Sapir, 2009), while in other studies gender effect was not significant after controlling for other variables (Hazelrigg & Hardy, 1997; Stoller & Stoller, 2003). Contrary to these papers a study comprising data from 31 European countries on pensioners' economic well-being, found that being a woman increases the difficulty in making ends meet to some extent (Palomäki, 2017). Moreover, in a similar study Fonseca et al. (2014) found that women are more vulnerable to old-age poverty. Educational attainment is another variable that is commonly used in explaining perceived income adequacy. A positive association among these variables is explained by the fact that more-educated individuals occupy better-paid working positions. Researchers found that lower educated individuals report less favourable perceptions of income adequacy compared to those with higher education levels (Ballantyne & Marshall, 2001; Chan et al., 2002; Cracolici et al., 2012, Cracolici, Giambona, & Cuffaro, 2014; Fonseca et al., 2014; Grable et al., 2013; Li et al., 2011; Litwin & Sapir, 2009, Litwin, 2009; Palomäki, 2017). Furthermore, self-reported health status exhibits a strong positive relationship with subjective income adequacy. Adults who assess their health more positively were more likely to be satisfied with their income status (Ballantyne & Marshall, 2001; Chan et al., 2002; Cracolici et al., 2012; Gildner et al., 2019; Hazelrigg & Hardy, 1997; Hsieh, 2003; Li et al., 2011; Palomäki, 2017, 2019; Stoller & Stoller, 2003).

Besides socio-demographic and health-related variables affecting perceived income adequacy, some studies also consider objective economic or financial indicators. Litwin and Sapir (2009) showed that objective economic indicators measured by respondents' income and wealth are the strongest predictors of perceived income adequacy. When considering financial factors, Li et al. (2011) found that respondents with higher actual income were more likely to report greater income adequacy. Ballantyne and Marshall (2001) confirm that perceived income adequacy is a function of objective economic status. Chan et al. (2002) found significant, but weak relationship between the actual income and perceived income adequacy in Singapore and Taiwan.

A number of authors found that respondents with pessimistic financial expectations were likely to report financial difficulties (Ballantyne & Marshall, 2001; Litwin & Meir, 2013, Rehm, Hacker, & Schlesinger, 2013; Litwin & Sapir, 2009). Rehm et al. (2013) also found that people with weaker financial buffers are significantly more worried about their economic security. They examined private buffering as the ability

of households to deal with unexpected shocks measured through their capacity to borrow (in financial markets or from family members and friends) or use financial reserves (use retirement accounts to finance current bills).

A number of papers also address living arrangements such as number of children, living with children and other social network or family related variables. Guagnano, Santarelli, and Santini (2016) found that European households ability to make ends meet worsens for respondents with more than two children. Furthermore, older adults who lived with children were more likely to report financial difficulties (Chan et al., 2002; Li et al., 2011; Litwin, 2009), which is in contrast to findings of Hazelrigg and Hardy (1997) where older adults' perceived income adequacy was positively related to living with children. Chan et al. (2002) found regional differences when it comes to living arrangements. Respondents living alone in Taiwan were less likely to report favourable changes in income adequacy than those living with a child, whereas living arrangements in Singapore were unrelated to change in perceived income adequacy.

Gildner et al. (2019) account for household settings by classifying respondents as living in urban or rural area, while Litwin and Sapir (2009) found significant country differences in perceived income adequacy even after controlling for the effects of other variables. Respondents in Greece, Italy, Spain and Israel were more likely to report difficulty in making ends meet than those in Switzerland. Similarly, when comparing results of 27 European countries, Guagnano et al. (2016) found that respondents from Greece, Portugal, Ireland and Cyprus were most likely to report great difficulty in ability to make ends meet. On the other hand, respondents from Sweden, Finland, the Netherlands and Denmark were most satisfied with their income. Country-specific effects were also found in observing changes in perceived income adequacy of elderly in Singapore and Taiwan (Chan et al., 2002). Differences in perceived income adequacy were also reported across different regional settings in which Mediterranean respondents reported greater difficulty in making ends meet compared to their non-Mediterranean counterparts (Litwin, 2009). Hersey et al. (2010) found that future retirement income worries were more pronounced in countries with strong projected increase of population age and high level of income inequality. They found that older, female and lower educated respondents as well as those with poor health tend to have lower income adequacy and are more worried about their future retirement income.

### 3. Data, sample description and methodology

For the purpose of present study, we use individual level data available from Round 5 within the E.S.S.<sup>4</sup> This was the last round in which Croatia participated. Sample consisted of 1,121 respondents from Croatia, out of which 398 were in paid work, 446 were pension beneficiaries and 263 belonged to the third category comprised from respondents in education, unemployed, sick or doing housework. Out of the whole sample, 55.5% were female respondents and almost a half of all respondents (44.5%) have completed lower tier upper secondary or less.

The dependent variable was derived from E.S.S. indicator which refers to *feeling about household's income nowadays* (coded from 1 = living comfortably at present

income to 4=living very difficult at present income). This variable reflects perceptions of the adequacy of individual income. Based on the previous studies, individual determinants that are expected to influence the perception of income adequacy refer to household's total net income, the extent of savings/debt used to cover ordinary living expenses, overall satisfaction with the economy, gender, age, level of education, general health, living arrangement, region and living area.

Explanatory variables considered in the analysis are coded as follows: economic status measured by the *total net income* is coded on a three-level rating scale (1 = 1, 2 and 3rd decile; 2 = 4, 5 and 6th decile; 3 = 7, 8 9 and 10th decile); the *extent to which respondents had to draw on savings/debt in order to cover ordinary living expenses* coded on a three-level rating scale (1 = not at all or somewhat to 3 = considerably or to a great extent); *satisfaction with the present state of economy* on a two-level scale (0 = dissatisfied and 1 = satisfied). Other individual characteristics recognised in the literature to affect perceived income adequacy include: *gender* (1 = male and 2 = female); respondent's *age* categorised into three categories (1 = less than 65; 2 = from 65 to 74; 3 = more than 74)<sup>5</sup>; the *level of education* presented on a six-level scale (1 = less than lower secondary to 6 = lower and higher tertiary education); perception of *general health* on a three-level scale (1 = good and very good to 3 = bad and very bad); *living arrangement* measured by whether the respondent has children living at home (1 = respondent has children living at home and 2 = has not). Other controls are *region* according to NUTS area (0 = Northwest and Eastern Croatia and 1 = Adriatic Croatia) and *living area* on a three-level scale (1 = big city to 3 = county village or farm). Due to the low frequency of answers in some of the categories, some of the variables had to be recoded. Definitions and explanations of the variables considered in the model estimation are presented in [Table A1](#) in the Appendix.

Based on the previous findings, it is expected that the respondents with low income will likely report having financial difficulty than those with high income. Moreover, it is expected that respondents who had to draw on savings or debt to a higher extent will more likely perceive their income as inadequate. Same goes for respondents who are dissatisfied with the present state of the economy.<sup>6</sup> It is also possible to assume that highly educated respondents are less likely to report financial difficulties since higher educational attainment is related with higher levels of income. Furthermore, respondents with poor health will more likely to report financial distress as, in addition to health-related costs, they may often be excluded from the labour market. Respondents with children living at home are expected to report less favourable perceptions of income adequacy. Although female respondents most commonly occupy lower paid work positions, the effects of gender on perceived income adequacy is ambiguous, as some studies found that men are less likely to report their income as adequate. Moreover, the literature finds that older respondents report higher levels of income adequacy, even though their income is relatively low compared to younger ones. Respondents living in rural areas are also expected to be less satisfied with their income than the ones living in big cities. Finally, it is assumed that disparities in economic and social development across Croatian regions will result in regional differences of perceived income adequacy.



Perceived income adequacy is examined by using the ordered logit model (also known as the proportional odds model) in which the response (outcome/dependent) variable is measured on an ordinal scale. In an ordered logit model (ologit), all variables should meet the parallel lines/proportional odds assumption according to which the coefficients across different logistic regressions should be the same. In cases where the assumption on parallel lines is violated, the partial proportional odds model (P.P.O.) or generalised ordered logit model (gologit) should be employed (Williams, 2016, 2006). However, the unconstrained gologit model will generate more parameters than the ordered logit model as it allows all variables to be free from the proportional odds assumption. Therefore, if only a few variables violate this assumption, the P.P.O. should be preferred, as it relaxes the parallel lines/proportional odds constraint for only those variables that violate the assumption, while other variables remain constrained. In addition to being more parsimonious than the gologit model, the P.P.O. is also less restrictive than ologit model.

For an ordinal response variable with four possible values (outcomes), the gologit model will have three equations (three sets of parameters) estimated simultaneously (Williams, 2016, 2006):

$$P(Y_i > j) = \frac{\exp(\alpha_j + X_i \beta_j)}{1 + [\exp(\alpha_j + X_i \beta_j)]}, \quad j = 1, 2, \dots, M - 1 \quad [1]$$

The logit model is a special case of the gologit model when  $M$  equals 2 (two outcomes/categories). The special case of gologit model is also the ologit model in which beta parameters are the same for each  $j$ . Therefore, in the ologit model, the  $j$  subscripts reported in the above formula are redundant.

To reconcile the restrictive ologit model with the gologit model without constraints, we apply the P.P.O. model by allowing some of the beta parameters to differ for some values of  $j$ , while other parameters remain constrained (equal betas for each  $j$ ).

$$P(Y_i > j) = \frac{\exp(\alpha_j + X1_i \beta1 + X2_i \beta2 + X3_i \beta3_j)}{1 + [\exp(\alpha_j + X1_i \beta1 + X2_i \beta2 + X3_i \beta3_j)]}, \quad j = 1, 2, \dots, M - 1 \quad [2]$$

The beta parameters in formula (2) are constrained to be the same across all  $j$  values for  $X1$  and  $X2$  variables, but are not constrained for the  $X3$  variable. Therefore, the key feature of the P.P.O. model is that it gives the possibility to relax the parallel lines/proportional odds assumption only for those variables where this assumption is violated (Williams, 2016, 2006).

#### 4. Empirical analysis

Although most studies examined perceived income adequacy of older or retired individuals, the focus of this article is to detect socio-economic drivers of perceived income adequacy of all available respondents (employed, retired and respondents involved in some other activity). However, as demographic changes in Croatia move

towards population ageing and most studies examine factors affecting perceived income adequacy of elderly and retired respondents, financial capacity of retired people will be performed also in a separate analysis.

The empirical analysis starts by estimating the ologit model including all available respondents from Croatia (Model 1a and Model 1b). Then, a new ologit model is derived by using only the respondents in retirement (Model 2). Both model specifications are presented in [Table 1](#).

The results of the ologit model by taking all respondents into account (Model 1a and Model 1b) are in line with expectations. They indicate that most variables, except gender, region and living area are statistically significant predictors of financial difficulties. Respondents in average income categories are more likely to report financial difficulty compared to those with high incomes, while those in lower income categories are even more likely to report financial difficulty. These results are in line with findings of Litwin and Sapir (2009), Li et al. (2011) and Ballantyne and Marshall (2001). Respondents who perceive their income as inadequate are also more likely to draw in a higher extent their savings or debt in order to cover ordinary living expenses.

Results also indicate that respondents being pessimistic about the state of the economy are more likely to perceive their income as inadequate. However, results did not confirm significant gender differences in perceived income adequacy.

Based on the literature, age is the most commonly analysed socio-demographic factor when it comes to perceived income adequacy (Litwin & Sapir, 2009; Stoller & Stoller, 2003). Due to the different approaches in analysing the relative importance of age across studies, Model (1a) and Model (1b) differ by the categorisation of variable related with respondents' age. In Model (1a), respondents in age groups of 25–39 and 39–64 are more likely to perceive their income as inadequate compared to those aged 25 years and younger. The increased housing costs and childcare expenses could explain economic hardship experienced by former age groups. Respondents' age in Model (1b) is categorised into three age groups similarly to Palomäki (2017) and Litwin and Sapir (2009). Respondents aged 75 years and more are less likely to report financial difficulties than those under 65 years, which is not in line with expectations due to lower income of retired people. However, most studies found that older respondents are generally more satisfied with their income compared to middle-aged and younger adults (Ballantyne & Marshall, 2001; Hazelrigg & Hardy, 1997; Hsieh, 2003; Litwin & Sapir, 2009). Decreased general expenses in the late life, adult children and accumulation of wealth allow older people to cope with lower income. Many authors find that the oldest-old respondents (aged 80 years and older) report less financial difficulty and overestimate their financial capabilities, even though they live in objectively inadequate economic circumstances (George, 1992; Hazelrigg & Hardy, 1997; Litwin & Sapir, 2009).

Lower educated respondents and respondents who perceive their health as bad or very bad were more likely to state that they find it difficult to live on present income. More specifically, respondents with lower tier upper secondary education and above were less likely to report financial difficulties than those with less than lower secondary school education. Respondents whose self-rated health was bad or very bad

**Table 1.** Determinants predicting perceived income adequacy.

Ordered logit estimates (OLOGIT)	Model (1a)	Model (1b)	Model (2)
Perceived income adequacy	All respondents	All respondents	Only respondents in retirement
Net income			
Low income	2.142*** [10.520] (0.204)	2.163*** [10.679] (0.203)	1.618*** [4.453] (0.363)
Average income	0.973*** [5.863] (0.166)	0.979*** [5.916] (0.165)	0.406 [1.302] (0.312)
To what extent had to draw on savings/debt to cover ordinary living expenses last 3 yrs?			
Moderately	0.489*** [3.389] (0.144)	0.509*** [3.533] (0.144)	0.438** [1.964] (0.223)
Considerably or to a great extent	1.518*** [8.850] (0.172)	1.536*** [8.962] (0.171)	1.293*** [4.670] (0.277)
Satisfaction with the present state of economy in country			
Dissatisfied with the economy	0.489*** [3.108] (0.157)	0.516*** [3.294] (0.157)	0.506* [1.763] (0.287)
Gender			
Female	-0.009 [-0.067] (0.127)	-0.019 [-0.149] (0.127)	-0.101 [-0.467] (0.216)
Age_1			
More than 25 and less or equal to 39	0.420* [1.711] (0.245)		
More than 39 and less or equal to 64	0.393* [1.812] (0.217)		
More than 64 and less or equal to 74	0.183 [0.699] (0.261)		
More than 74	-0.063 [-0.206] (0.307)		
Age_2			
More than 64 and less or equal to 74		-0.162 [-0.873] (0.185)	-0.040 [-0.179] (0.222)
More than 74		-0.407* [-1.654] (0.246)	-0.159 [-0.544] (0.292)
Highest level of education			
ES-ISCED II, lower secondary	-0.143 [-0.528] (0.271)	-0.142 [-0.525] (0.271)	-0.039 [-0.121] (0.327)
ES-ISCED IIIb, lower tier upper secondary	-0.654** [-2.180] (0.300)	-0.656** [-2.190] (0.300)	-0.931*** [-2.432] (0.383)
ES-ISCED IIIb, upper tier upper secondary	-0.720** [-2.392] (0.301)	-0.746** [-2.486] (0.300)	-0.963** [-2.371] (0.406)
ES-ISCED IV, advanced vocational, sub-degree	-1.140*** [-3.004] (0.379)	-1.119*** [-2.955] (0.379)	-1.236** [-2.362] (0.523)
ES-ISCED V1 and V2, lower and higher tertiary education	-1.674*** [-4.621] (0.362)	-1.633*** [-4.559] (0.358)	-1.479** [-2.336] (0.633)

*(continued)*

**Table 1.** Continued.

Ordered logit estimates (OLOGIT)	Model (1a)	Model (1b)	Model (2)
Perceived income adequacy	All respondents	All respondents	Only respondents in retirement
Subjective general health			
Fair health	0.073 [0.472] (0.155)	0.105 [0.687] (0.153)	−0.009 [−0.039] (0.237)
Bad and very bad health	0.877*** [4.232] (0.207)	0.910*** [4.387] (0.208)	1.024*** [3.800] (0.269)
Living arrangement			
Respondent has children living at home	0.347** [2.530] (0.137)	0.427*** [3.257] (0.131)	0.515** [2.249] (0.229)
Region – NUTS			
Adriatic Croatia	−0.123 [−0.918] (0.135)	−0.115 [−0.855] (0.134)	−0.323 [−1.439] (0.225)
Living area			
Living in the suburb of a big city, town or a small city	−0.003 [−0.018] (0.173)	0.010 [0.056] (0.172)	0.144 [0.530] (0.271)
Living in country village or farm	−0.173 [−0.989] (0.175)	−0.170 [−0.973] (0.174)	−0.275 [−0.963] (0.285)
Constant cut1	−0.185 [−0.455] (0.407)	−0.432 [−1.124] (0.385)	−1.120* [−1.652] (0.678)
Constant cut2	3.101*** [7.430] (0.417)	2.845*** [7.245] (0.393)	2.319*** [3.474] (0.668)
Constant cut3	4.806*** [11.125] (0.432)	4.550*** [11.106] (0.410)	4.153*** [6.052] (0.686)
Observations	1,121	1,121	460
Pseudo R2	0.1856	0.184	0.153
Brant test	0.076	0.125	0.095

Notes: Robust z-statistics in brackets, robust standard errors in parentheses.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Reference categories: 3–7, 8, 9 and 10th decile (High income); Not at all or somewhat; Satisfied with the economy (5–10); Male; Ref. for Age\_1–Less or equal to 25; Ref. for Age\_2–Less than 65; ES-ISCED I, less than lower secondary; Good and very good; Respondent does not have children living at home; Continental Croatia; Living in the big city.

perceive their household income as inadequate. Findings related with effects of education and health on perceived income adequacy were confirmed in most studies dealing with perceived income adequacy.

Respondents that have a child or children living at home are more likely to report financial difficulties. This may be attributed to lower GDP per capita compared to other E.U. countries, high youth unemployment and tradition of living with parents. In 2017, the largest share of young adults aged 25 to 34 who are still living with their parents was recorded in Croatia (Eurostat, 2019c). Positive association between living with child and financial difficulties was also found in other studies (Chan et al., 2002; Li, Chi & Xu, 2011; Litwin, 2009). Obtained result suggest that region and living area had no significant effect on income adequacy judgements.

Further, test proposed by Brant (Long & Freese, 2014) is used in order to test the assumption on parallel lines/proportional odds. The null hypothesis states that there

is no difference in the coefficients between models, i.e., variables meet the parallel lines/proportional odds assumption.

According to Brant test, the null hypothesis cannot be rejected for Model (1b) ( $p$ -value of 12.5%,  $\chi^2$  of 48 with 38 degrees of freedom) – the parallel regression assumption is not violated. However, Brant test for Model (1a) indicates that variables that refer to the extent to which the respondent had to draw savings or incur debt in order to cover ordinary living expenses, the level of attained education and living area violate the proportional odds/parallel lines assumption, and thus the  $p$ -value of the Brant test does not exceed the 10% significance level for not rejecting the null hypothesis ( $p$ -value of 7.6%,  $\chi^2$  of 55.7 with 42 degrees of freedom). Therefore, a P.P.O. is estimated in which the parallel lines assumption for the aforementioned variables is relaxed (Table A2 in Appendix).

The coefficients of the constrained variables that meet the parallel lines assumption (net income, satisfaction with the economy, gender, age, health, living arrangement and region) are similar to those obtained by the ologit model and can be interpreted equally. The remaining three variables are released from the proportional odds/parallel lines constraint. The obtained results indicate that respondents who feel that they live comfortably as well as those who feel they can cope on their present income are more likely to report a moderate draw of their savings or debt to cover ordinary living expenses. On the other hand, those who state living difficult on their present income report considerable draw of their savings or debt. Furthermore, the attained level of education is more pronounced for those who report to live difficult or coping on their present income. This may imply that less educated respondents are more likely to feel threatened by the financial difficulties than those more educated. For respondents who live comfortably at their present income, the level of education is not of such importance, except for those with tertiary education. When it comes to the living area, once the assumption of proportional odds/parallel lines is relaxed, living area appears statistically significant. Respondents living in a country (village or farm) are less likely to report financial difficulties compared to those living in a big city, but this appears statistically significant only for categories *coping on present income* and *living difficult on present income*.<sup>7</sup>

Since one of the objectives is to determine which variables are significant predictors of perceived income adequacy among pension beneficiaries, a separate model is estimated by analysing only respondents in retirement (Model 2 in Table 1). As stated previously, most studies analysing income satisfaction have focused on the perceived income adequacy of the elderly. They are an interesting focus group due to major life changes such as retirement and adaptation to decreased income. Perceived income adequacy of retirees in Croatia is interesting given that a significant share of pension beneficiaries are at high risk of poverty and at the same time, they are an increasing part of the overall population. According to Bađun and Smolić (2018), poor economic restructuring often caused early retirement in Croatia. They found that ‘involuntary’ retirement is widespread in Croatia, which was supported by the fact that almost 19% of respondents in their research retired due to early retirement option with special bonus. Less educated employees in Croatia, those with poor self-rated health as well as those who work within the private sector have higher probability of early retirement.

The analysis for retired respondents (Model 2) reveal similar findings as the one including all respondents. However, only pension beneficiaries in lower income categories are more likely to perceive their income as inadequate compared to those in higher income categories. Pension beneficiaries that draw on their savings or incur debt moderately as well as those that draw savings or debt to a higher extent are likely to report living difficult on their present income. Furthermore, retired people who are dissatisfied with the present state of economy are more likely to report financial difficulty. Age variable failed to emerge as a statistically significant predictor of perceived difficulty among retired respondents, which is not in line with results obtained when considering all respondents. Similar to results for all respondents, education and health also emerged as significant predictors of perceived income adequacy. More educated retired respondents are less likely to perceive financial difficulty. This might be due to a better-paid working positions and thus higher levels of retirement income. In terms of health, pension beneficiaries with bad or very bad health were more likely to feel that they live difficult on their present income in comparison to those who are healthy. Pension beneficiaries that have children living at home were likely to report financial difficulty. A possible explanation arises from financial support that retirees provide to their children due to their low salaries and high youth unemployment in the country. Same as for all respondents, gender, region and living area did not prove to be statistically significant predictors of financial difficulties among retired respondents.

As far as Model (2) is concerned, assumption of proportional odds/parallel lines holds at 5% significance level ( $p$ -value of 9.5%,  $\chi^2$  of 49.8 with 38 degrees of freedom). The same as in the case of Model (1a), Brant test does not exceed the 10% significance level for not rejecting the null hypothesis. Variables that refer to the extent to which the respondents draw on their savings or debt in order to cover ordinary living expenses and the level of attained education violate the parallel lines assumption. Therefore, the proportional odds/parallel lines is relaxed for these variables and their explanation is the same as for the partial P.P.O. where all respondents were taken into consideration.<sup>8</sup>

## 5. Discussion and concluding remarks

Negative influence of external factors caused by the global financial crisis and the subsequent economic crises as well as the demographic changes related to population ageing and high dependency ratio of pension beneficiaries to working population, brought to spotlight the financial problems and difficulties facing Croatian citizens. Financial problems are even more pronounced when it comes to senior citizens whose financial problems arise from reduced income due to retirement or inability to work as well as higher health care expenses.

With this in mind, the aim of this article was to examine which socio-demographic and economic features are related to perceived income adequacy of Croatian citizens. In line with previous studies, our results confirm that objective economic status is a strong predictor of perceived income adequacy. Hence, individual's income can be

used as an indicator of financial capacity for all respondents and just the retired respondents alike.

Although older respondents may have lower income compared to younger ones, results indicate that older respondents are less likely to report financial difficulty. In line with other studies, older respondents are generally more satisfied with their income compared to middle-aged and younger adults. One possible explanation for this is that older people have lower general expenses, higher home ownership rate and have accumulated enough wealth during their working life. Another explanation is that younger respondents pursue a consumption-based lifestyle that is inconsistent with their resources, while older respondents grew up during more difficult times and are thus easier to satisfy. These results also confirm previous findings in which younger and middle-aged adults evaluate their success relative to their most successful peers, while older ones compare themselves with other older adults. Different categorisation of the variable reflecting the respondents' age showed that perceived income adequacy is higher for very young respondents (under 25), while middle-age respondents perceive more financial strain.

Contrary to some studies where living with children was positively related with perceived income adequacy, we find that adults living with children are more likely to report financial difficulties. Respondents with small children and children attending school face child-related costs. Additional costs are present even for those with an adult child due to high youth unemployment and low starting salaries. This puts an additional burden on parents in providing financial help to their children. This problem is even more pronounced in our results since the largest share of young E.U. adults who are still living with their parents was recorded in Croatia. Based on obtained results, policies should provide and subsidise social services, like kindergartens, and increase tax deductions and family allowances for parents with more children and dependents. In addition, we find that the more educated adults are likely to perceive their income as adequate possible due to better-paid positions compared to those with lower education. In line with these results, education and job policies are of utmost importance for enabling young population to achieve a higher level of education, which serves as a prerequisite for a better-paid job positions.

Since we confirmed that self-rated economic status is primarily the result of higher objective income, increasing the minimum wage for working-age population and setting the national minimum pensions could increase the overall financial satisfaction. The influence of real income is even stronger when other important factors, such as age and living with children, are taken into account. We can conclude that in addition to increasing the citizens' real income, tax and policy measures targeted towards population in a particular age group and living arrangement becomes extremely important.

## Notes

1. The at-risk-of-poverty threshold is determined as 60% of the middle value (median) of the equalised disposable income of all persons.
2. People at risk of poverty or social exclusion refers to persons who are at risk of poverty, or severely deprived, or living in a household with a low work intensity.

3. According to Financial Agency (F.I.N.A.) situation is quite similar in December 2016 in which 327,176 of citizens had blocked account.
4. The E.S.S. have been conducting surveys of social attitudes and behaviour in up to 34 European countries since 2001. Up to 2016, there were eight rounds. Croatia was included in Round 4 (2008/09) and Round 5 (2010/11). Croatia applied for Round 9 which started at the end of 2018.
5. Based upon literature, the relative importance of age on perceived income adequacy was also examined by categorising *age* into five categories (1 = less or equal to 25; 2 = more than 25 and less or equal to 39; 3 = more than 39 and less or equal to 64; 4 = more than 64 and less or equal to 74 and 5 = more than 74).
6. According to ESS Round 4 survey, Croatia was the third most dissatisfied country out of 28 countries when it comes to the standard of living for pension beneficiaries and opportunities for young people to find employment (Round 4, 2008/09).
7. More on the interpretation of results can be found at Williams, R. (2006).
8. Results of P.P.O. on retired respondents are available upon request.

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## Appendix

**Table A1.** Description of variables.

VARIABLE DESCRIPTION	ESS categories	Model categories
	<b>Dependent (outcome) variable</b>	
<b>Perceived income adequacy (Feeling about household's income nowadays)</b>	1 Living comfortably on present income	1 Living comfortably on present income
	2 Coping on present income	2 Coping on present income
	3 Finding it difficult on present income	3 Finding it difficult on present income
	4 Finding it very difficult on present income	4 Finding it very difficult on present income
	<b>Independent variables</b>	
<b>Net income (Deciles of the household's total net income, monthly, in HRK)</b>	1 Less than 1,850	1 – 1, 2 and 3rd decile (Low income)
	2 1,851 to 2,600	
	3 2,601 to 3,500	
	4 3,501 to 4,500	2 – 4, 5 and 6th decile (Average income)
	5 4,501 to 5,501	
	6 5,501 to 6,700	
	7 6,701 to 8,200	
	8 8,201 to 9,700	3 – 7, 8, 9 and 10th decile (High income)
	9 9,701 to 12,100	
	10 More than 12,101	

(continued)

**Table A1.** Continued.

VARIABLE DESCRIPTION	ESS categories	Model categories	
<b>To what extent had to draw on savings/debt to cover ordinary living expenses last 3 years?</b>	0 Not at all	1 Not at all or somewhat	
	1		
	2		
	3	2 Moderately	
	4		
	5	3 Considerably or to a great extent	
<b>Satisfaction with the present state of economy</b>	From 0 (Extremely dissatisfied) to 10 (Extremely satisfied)	0 Dissatisfied (answers from 0–4)	
		1 Satisfied (answers from 5–10)	
<b>Gender</b>	1 Male	1 Male	
	2 Female	2 Female	
<b>Age_1</b>	Continuous variable (from 15 to 94)	1 Less or equal to 25	
		2 More than 25 and less or equal to 39	
		3 More than 39 and less or equal to 64	
		4 More than 64 and less or equal to 74	
		5 More than 74	
<b>Age_2</b>	Continuous variable (from 15 to 94)	1 Less than 65	
		2 More than 64 and less or equal to 74	
		3 More than 74	
		1 ES-ISCED I, less than lower secondary	1 ES-ISCED I, less than lower secondary
		2 ES-ISCED II, lower secondary	2 ES-ISCED II, lower secondary
3 ES-ISCED IIIb, lower tier upper secondary	3 ES-ISCED IIIb, lower tier upper secondary		
<b>Highest level of education</b>	4 ES-ISCED IIIb, upper tier upper secondary	4 ES-ISCED IIIb, upper tier upper secondary	
	5 ES-ISCED IV, advanced vocational, sub-degree	5 ES-ISCED IV, advanced vocational, sub-degree	
	6 ES-ISCED V1, lower tertiary education	6 ES-ISCED V1 and V2, lower and higher tertiary education	
	7 ES-ISCED V2, higher tertiary education		
	1 Very good	1 Very good and good	
	2 Good	2 Fair	
	3 Fair	3 Bad and very bad	
<b>Subjective general health</b>	4 Bad		
	5 Very bad		
<b>Children living at home or not</b>	1 Respondent has children living at home	1 Respondent has children living at home	
	2 Does not	2 Does not	
<b>Region - NUTS</b>	1 Northwest Croatia	0 Continental Croatia	
	2 Eastern (Pannonian) Croatia		
	3 Adriatic Croatia	1 Adriatic Croatia	
<b>Living area</b>	1 Big city	1 Big city	
	2 The suburbs or outskirts of a big city	2 Living in the suburb of a big city,	
	3 A town or a small city	town or a small city	
	4 A country village	3 Living in country village or farm	
	5 A farm or home in the countryside		

**Table A2.** The impact on the perceived income adequacy by using partial proportional odds model (all respondents).

Partial proportional odds model (PPO)	(1) ALL	(2) ALL	(3) ALL
Perceived income adequacy	Living comfortably on present income	Coping on present income	Difficult on present income
<b>Explanatory variables</b>			
<i>Net income</i>			
Low income	2.174*** [10.381] (0.209)	2.174*** [10.381] (0.209)	2.174*** [10.381] (0.209)
Average income	0.964*** [5.700] (0.169)	0.964*** [5.700] (0.169)	0.964*** [5.700] (0.169)
<i>To what extent had to draw on savings/debt to cover ordinary living expenses last 3 yrs?</i>			
Moderately	0.725*** [3.524] (0.206)	0.400** [2.054] (0.195)	-0.224 [-0.698] (0.322)
Considerably or to a great extent	1.481*** [5.311] (0.279)	1.546*** [7.685] (0.201)	1.172*** [4.285] (0.273)
<i>Satisfaction with the present state of economy in country</i>			
Dissatisfied with the economy	0.503*** [3.171] (0.158)	0.503*** [3.171] (0.158)	0.503*** [3.171] (0.158)
<i>Gender</i>			
Female	0.005 [0.036] (0.130)	0.005 [0.036] (0.130)	0.005 [0.036] (0.130)
<i>Age_1</i>			
More than 25 and less or equal to 39	0.448* [1.748] (0.256)	0.448* [1.748] (0.256)	0.448* [1.748] (0.256)
More than 39 and less or equal to 64	0.433* [1.914] (0.226)	0.433* [1.914] (0.226)	0.433* [1.914] (0.226)
More than 64 and less or equal to 74	0.206 [0.776] (0.265)	0.206 [0.776] (0.265)	0.206 [0.776] (0.265)
More than 74	-0.031 [-0.101] (0.309)	-0.031 [-0.101] (0.309)	-0.031 [-0.101] (0.309)
<i>Highest level of education</i>			
ES-ISCED II, lower secondary	0.671 [1.535] (0.438)	-0.059 [-0.213] (0.279)	-0.786** [-2.258] (0.348)
ES-ISCED IIIb, lower tier upper secondary	0.123 [0.293] (0.419)	-0.811*** [-2.580] (0.314)	-0.865** [-2.302] (0.376)
ES-ISCED IIIb, upper tier upper secondary	0.097 [0.238] (0.406)	-0.885*** [-2.773] (0.319)	-1.432*** [-3.307] (0.433)
ES-ISCED IV, advanced vocational, sub-degree	-0.384 [-0.837] (0.459)	-1.249** [-2.498] (0.500)	-1.175 [-1.540] (0.763)
ES-ISCED V1 and V2, lower and higher tertiary education	-0.940** [-2.159] (0.435)	-1.420*** [-3.071] (0.462)	-1.411** [-2.085] (0.677)
<i>Subjective general health</i>			
Fair health	0.077 [0.487] (0.157)	0.077 [0.487] (0.157)	0.077 [0.487] (0.157)

(continued)

**Table A2.** Continued.

Partial proportional odds model (PPO)	(1) ALL	(2) ALL	(3) ALL
Bad and very bad health	0.877*** [4.240] (0.207)	0.877*** [4.240] (0.207)	0.877*** [4.240] (0.207)
<i>Living arrangement</i>			
Respondent has children living at home	0.367*** [2.594] (0.141)	0.367*** [2.594] (0.141)	0.367*** [2.594] (0.141)
<i>Region - NUTS</i>			
Adriatic Croatia	-0.142 [-1.036] (0.137)	-0.142 [-1.036] (0.137)	-0.142 [-1.036] (0.137)
<i>Living area</i>			
Living in the suburb of a big city, town or a small city	0.121 [0.551] (0.219)	-0.077 [-0.354] (0.219)	-0.356 [-1.118] (0.318)
Living in country village or farm	0.277 [1.184] (0.234)	-0.561*** [-2.520] (0.222)	-0.725** [-2.238] (0.324)
Constant	-0.871* [-1.775] (0.491)	-2.892*** [-6.844] (0.423)	-3.808*** [-7.446] (0.511)
Observations	1,121	1,121	1,121

Notes: Parallel lines assumption is relaxed for the extent to which the respondents draw on savings/debt in order to cover ordinary living expenses, the level of attained education and living area.

Robust z-statistics in brackets, robust standard errors in parentheses.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Reference categories: 3–7, 8, 9 and 10th decile (High income); Not at all or somewhat; Satisfied with the economy (5–10); Male; Ref. for Age\_1—Less or equal to 25; ES-ISCED I, less than lower secondary; Good and very good; Respondent does not have children living at home; Continental Croatia; Living in the big city.