



Acceptance for Income Inequality in Poland

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Abstract

According to the contemporary theory of income inequality, the impact of this phenomenon on other economic categories is determined by the way it is perceived and accepted. Therefore, it is worth deepening knowledge on income disparity by identifying the factors that most influence acceptance for the latter. The main purpose of the article is to identify the factors affecting acceptance for income inequality in Poland. The basis for estimations conducted to verify the research hypotheses was a set of microdata from a survey conducted in Poland in 2019. Models were estimated using the Generalized Structural Equation Modelling approach. Our study revealed the endogeneity issues resulting from inclusion attitudes towards redistribution in the model of acceptance for income inequality. We have also revised results obtained in other research concerning similar problems—only income, age, sense of empowerment, conservative worldview and attitude towards redistribution proved to have direct significant impact on acceptance for income inequality.

Keywords Acceptance for income inequality · Redistribution · Attitudes · Endogeneity · GSEM

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1 Introduction

There is observed an increase in income inequality, understood both as income dispersion between and within particular countries. The causes of this phenomenon are seen in the processes of globalization, changes in the labour market and modifications made in the framework of taxation and redistribution policies (Cohen & Ladaïque, 2018). Factors related to demographic changes, mainly the ageing of the population, may also be relevant (Iwański, 2017).

Within the framework of the consequences of income inequality growth, attention is paid to three basic factors that determine the type and intensity of the effects of this process: the scale of the phenomenon in a given country, the acceptance of the society for the current level of income differences, and the legal mechanisms in place (mainly concerning redistributive policies), which can more or less effectively counteract inequality or offset some of its effects. In recent decades, researchers (e.g. Brunori, 2017; Cruces et al., 2013; Gimpelson & Treisman, 2015; Jasso, 2007; Niehues, 2014), have been particularly interested in the second of the above mentioned areas, i.e. the acceptance or perception of income inequalities and their determinants.

It is worth emphasizing that according to the contemporary theory of income inequality, the impact of this phenomenon on other economic categories is determined by the way it is perceived and accepted. The level of society's acceptance of inequality, in turn, influences the decisions made at the political (Xu & Garand, 2010) and economic levels. The logic behind such a transmission mechanism is based on the fact that the initiatives taken by an economic unit depend not only on individual preferences and available resources, but also on the perception of the state of the economy and the external markets (Knell & Stix, 2020). Hence, it is worth deepening the knowledge on income disparity by identifying the factors that most influence an individuals' acceptance for income inequality.

Therefore, the main purpose of the article is to identify the factors affecting the acceptance for income inequality in Poland. Although the indicated issues have already been addressed by numerous researchers, a lack of in-depth analysis of factors affecting the level of acceptance for inequality was observed in the last decade.

Conducting such a research is important for several reasons. Firstly, as stated by Bussolo et al. (2021), Czerniak et al. (2018), Malinowski (2014) and Wysieńska (2014) the level of acceptance for the phenomenon and its perception by Poles are characterized by significant dynamics. Secondly, the level of inequality in Poland has been significantly changing over the past 15 years. Although the Gini index for Poland suggests that income disparities have decreased since 2004 (Eurostat, 2021), measures focusing more on lower and upper tail of income distribution allow quite different observations. As Gini index is more sensitive to the income of the middle classes than it is to the income of the extremes, Zenga index (Panek & Zwierzchowski, 2021; Zenga, 2007), modified income quintile share ratio S80/S20 (Eurostat, 2022a) or share of upper quantiles in national income (Eurostat, 2022b) are more appropriate to draw conclusions on the changes in income disparities than Gini coefficient. Additionally, Bukowski and Novokmet (2021) advise to use fiscal rather than survey data when assessing the actual level of income inequalities. The former indicate that income disparities are much higher than observed based on the latter. Following the data from Bukowski and Novokmet (2021), specifically the income share of top decile, it should be stated that the inequality level in Poland was increasing until 2007, then we experienced a small decline, and since 2009 income disparities have been staying on the same level. Observations based on income quintile share ratio S80/S20 (Eurostat, 2022a)

and income share of top percentile (Eurostat, 2022b) confirm that over the second decade of this century income inequalities stayed on the same level or only a negligible decline was observed.

Third, in 2016, Poland introduced a programme of financial support for families, in the amount of PLN 500 per month (about 118 EUR) per child (NBP, 2016), which significantly affects the income structure, the sense of social justice and, perhaps, the acceptance for inequality. Social transfers are an important part of social policies aimed at addressing the negative effects of income inequality and reducing poverty (Slater, 2011). It is worth noting here that the aforementioned programme is, after pension benefits, the second largest social programme in Poland. The research to collect the data used in the study was conducted in 2019, i.e. several years after the introduction of the programme, which made it possible to analyse the impact of the latter on the categories analysed. In 2019, households covered by the benefit represented on average 12.7% of disposable income (CSO, 2020a). The cost of the benefit in 2016 was about 17.4 billion PLN, in 2020 it increased to 40.2 billion PLN (Górska, 2020). The programme has contributed to a decrease in the extreme poverty rate.¹ For single parents in 2015, so before the introduction of the benefit, it was 6.5%, in 2016 it was 5.6%. In families with 4 or more children, it fell from 18 to 14% (CSO, 2017a). In the following years, there was observed a steady decrease in the number of families at risk of extreme poverty, especially after 2019 when the benefit has also covered the first child without income criteria. In 2019, in families with children under 18, the extreme poverty rate was less than 5% (CSO, 2020b).

Fourth, this study of factors of acceptance for income inequality takes into account the phenomenon of endogeneity of attitudes towards redistribution. This issue is described in detail in the next section of the paper. It is only worth noting here that previous research has focused on the impact of attitudes towards inequality on attitudes towards redistribution. It is suspected that in Poland this influence also takes place in the opposite direction. In addition, factors of acceptance for income disparity are at the same time factors affecting attitudes towards redistribution (at least some of the factors), so failure to include attitudes towards redistribution in the model would be a cause of omitted variable bias (resulting from the fact that attitudes towards redistribution are related both with the dependent variable and with the independent variables).

Fifth, the authors' study of acceptance of inequality also includes questions of political preferences (leftist-rightist placement) and support for specific political groups that hold a particular worldview. Taking these variables into account may affect attitudes towards inequality (Arunachalam & Watson, 2018; Bavetta et al., 2019; Bussolo et al., 2021; Im, 2014). Rising income inequality can lead to increased party polarisation on economic issues depending on the characteristics of the political system (Gunderson, 2021). These factors, however, have not been considered in previous studies of acceptance for income inequality in Poland.

Sixth, a survey with a direct question about respondents' assessment of the current scale of income inequality was used to determine respondents' attitudes about inequality. In research on income inequality, this topic is often analysed together with the issue of poverty or state programs to address inequality, and surveys ask about attitudes toward redistribution rather than acceptance for income inequality itself (e.g. Czerniak et al., 2018; Malinowski, 2014; Wysieńska, 2014).

¹ The minimum subsistence level was taken as the extreme poverty line.

We start our study by literature review on the subject matter. We describe the factors of acceptance for income inequalities that were identified by other researchers. This part provides also information about hypotheses of the study. In the next section we specify data sources, define dependent and independent variables, and present a method that was used in estimations. Then we move on to outcome of our research. The results of analysis, model verification and robustness checks are presented. Additionally, we refer to hypotheses of the study. The last part of the paper contains discussion with brief comparison of our results to previous studies on the research problem. This section was completed by conclusions.

2 Background

According to the belief shared by many researchers, individual characteristics of the individual and the resulting subjective assessment of one's material situation are much more important for the acceptance for income inequality than the objective, measured by a certain index, level of income inequality (Niehues, 2016; Tay, 2014). Possible modifications of attitudes towards income stratification may be triggered by changes in actual income differences, but it is still the factors characterizing the individual that will determine acceptance of the latter (Kuhn, 2019).

In terms of socioeconomic factors, the individual's social position and status play a significant role in shaping the level of this acceptance, including: income level (Corneo & Grüner, 2002; Meltzer & Richard, 1981; Suhrcke, 2001), class affiliation, occupation, place of residence, education (Austen & Redmond, 2013; Finseraas, 2008; Knell & Stix, 2020), experience of material deprivation, potential for social mobility (Im, 2014), or being unemployed (Bussolo et al., 2021). In addition to socio-economic factors, acceptance for income inequality is also influenced by personal characteristics such as age (Cruces et al., 2013), gender² (Knell & Stix, 2020; Verwiebe & Wegener, 2000), conservative worldview (Im, 2014) and the resulting general aversion to diversity and difference in the most diverse dimensions (Glass & Marquart-Pyatt, 2008; Xydias, 2007), the nature of political views, namely leftist/rightist worldview (Alesina & Giuliano, 2009; Alesina et al., 2004), and religion (Bavetta et al., 2019; Hauser & Norton, 2017). However, acceptance for income inequality is shaped not only by religion but also by cultural factors (Benabou & Tirole, 2006; Lübker, 2004; Ohtake, 2008; Suhrcke, 2001), especially the influence of the media (Hauser & Norton, 2017). One of the important factors that can affect attitudes towards income inequalities is their actual level (Knell & Stix, 2020).

In the case of Poland, according to research conducted for data from the turn of the twentieth and twenty-first centuries, acceptance for income inequality is influenced by the following factors: income level, gender, age, place of residence, education, nature of professional activity, social class (Janicka & Slomczynski, 2013; Czerniak, et al., 2018). In particular, it is indicated that people with worse current socio-economic status (lower income, unemployed) and worse socio-economic prospects (older people, women, living in smaller towns, less educated) are characterized by lower acceptance of inequality and perceive society as more diverse in terms of income than people with better prospects and higher current socio-economic status, respectively (Bussolo et al., 2021).

² In Poland, the monthly average salary for men is about 18.5% higher than for women (CSO, 2017b).

Having regard to the above literature review we hypothesize that:

Hypothesis 1a The higher a person's socioeconomic status, the higher acceptance for income inequality (the latter is higher for better earners and those who are not unemployed).

Hypothesis 1b The better a person's socioeconomic prospects, the higher acceptance for income inequality (the latter is higher for younger people, men, living in larger towns and better educated).

Podemski (2011) suspects that attitudes towards income dispersion are also influenced by attitudes represented by members of society, including a sense of empowerment (influence on one's fate) and personal attitudes towards diversity and change (especially a conservative attitude in terms of views on social life). Acceptance for inequality also appears to be influenced by the nature of political and social justice views (Bussolo et al., 2021). The above observations have not, so far, been supported by broader research conducted in Poland, while these factors seem to play a large role in shaping the acceptance for income inequality, in line with the research described earlier in the text.

Therefore, we pose the following hypotheses:

Hypothesis 2a Individuals with a lower sense of empowerment are characterized by lower acceptance for income inequality.

Hypothesis 2b Individuals with conservative views on social life are characterized by lower acceptance for income inequality.

Hypothesis 2c People with leftist worldview are characterized by lower acceptance for income inequality.

At the same time, it is worth noting that the issue of attitudes towards redistributive policies should also be taken into account within the framework of the addressed problem (Bussolo et al., 2021; Kuhn, 2011). According to the results of an experimental study conducted by Cruces et al. (2013), subjective perceptions of income distribution and attitudes towards redistribution are interrelated. This relationship is usually considered as of one-direction nature—an increase in aversion to inequality causes an increase in support for redistribution. In the case of Poland in recent years, however, the situation is peculiar. A significant increase in social transfers (the universal child benefit introduced in 2016 that was mentioned before) may cause a change in the relationship between the perception of the redistributive function of the state and the level of acceptance for inequality. The introduction of the program was accompanied by drawing public attention to the negative consequences of income inequality (highlighting these consequences, especially in media coverage), which may intensify aversion to inequality and increase support for redistribution. The relationship described would thus be bidirectional (instead of the one-way relationship that has been widely analysed in the literature). Not only would unacceptance of inequality cause changes in attitudes toward redistribution, but an increase in support for redistribution would be associated with a decrease in acceptance of inequality.

We therefore hypothesize that:

Hypothesis 3 An increase in support for redistribution results in a decrease in acceptance for inequality.

An additional rationale for including attitudes toward redistribution in a model explaining changes in acceptance for income inequality is that omitting this variable would cause endogeneity problems. According to the study by Bussolo et al. (2021), attitudes towards redistribution are related to political views and age—individuals with leftist views and older people (who grew up in Poland during the period of statism in economic policy) will be more supportive of redistribution. Cusack et al. (2006) and Iversen and Soskice (2001) show that support for redistribution is negatively related to the level of education, in particular those with higher education are characterised by a significantly lower level of support for the redistributive function of the state. This means that some of the factors affecting acceptance for inequality are also factors influencing attitudes toward redistribution, which, in turn, are related to the explanatory variable in this study. Attitude toward redistribution should therefore be included in the model to avoid omitted variable bias. The way in which the empirical model is estimated will allow for diagnosing and attenuating the consequences of the endogeneity of the redistribution variable in such a way that the estimates are unbiased and consistent—details are described in the next section of the paper.

3 Data and Methods

3.1 Data Sources

This section is dedicated to the operationalization of theoretical and control variables, data sources, and estimation methods. In making certain methodological decisions, the authors of this text referred to the studies presented in Table 1, which addressed similar research problems and were conducted in comparable contexts.

The basis for the estimations, which were conducted to verify the hypotheses, was a set of microdata from a survey conducted in Poland in 2019. The research was conducted by the authors of this paper (survey questionnaire is available under the link: <https://ped.usz.edu.pl/wp-content/uploads/Access-to-the-survey-research..pdf>). The sample size was calculated as $n = 1067$ respondents for a population of 38.4 million people in Poland with a confidence level of 95%, a fraction of 0.05 and a maximum error of 3%. To reduce measurement errors, the research sample was doubled to reach a total of $n = 2117$ respondents. A stratified quota random sampling method was used in the study. The sample size was calculated for each of the 16 provinces in the country taking into account the distribution by age (6 categories), place of residence (urban/rural) and gender, based on the demographic data of the Central Statistical Office for the year 2018. The interviewers used the survey implementation card with a specific number of respondents in a given group by gender, age and place of residence when selecting respondents in their areas. Data on actual level of income inequalities, measured by income quintile share ratio are provided by Polish Central Statistical Office³ (CSO, 2022).

³ We decided to use data based on survey as income indicators measured on regional level and based on the fiscal data are still not available.

Table 1 Previous analyses of acceptance for income inequality

Source	Database/sample	Time range	Method	Dependent variable	Independent variables
Czerniak et al. (2018)	World values survey; Poland (1000 observations)	2007–2015	Frequency tables, t-test of significance of differences between age groups, education, etc Logistic regression (binomial logit model)	Acceptance for income inequality Support for political parties	Age, income, education, place of residence Acceptance for income inequality; evaluation of the validity of income inequality; control variables (education, age, income, place of residence)
Bavetta et al. (2019)	International Social Survey Programmes (ISSP) Social Inequality IV database; 16 countries, 1226 individuals	2009	Logistic regression (ordered logit model)	Perceived income inequality (synthetic indicator)	Demographics (gender, age); socioeconomics (level of education, if the individual is married if he is employed, reported level of income); self-positioning on a social scale; experiences of mobility; political orientation; degree of religiosity
Knell and Stix, (2020)	International Social Survey Programmes (ISSP) Social Inequality IV database; 40 countries	2009	Regression with country fixed effects	Perceived income inequality	Actual income inequality; control variables

Table 1 (continued)

Source	Database/sample	Time range	Method	Dependent variable	Independent variables
Kuhn, (2019)	International Social Survey Programmes (ISSP) Social Inequality database; all countries	1987, 1992, 1999, 2009	Fixed-effects regression for time and cross-section	Individuals' attitudes to and beliefs about social inequality: 1. Beliefs about the causes of economic success 2. The perception of chances and risks associated with inequality 3. The role of government and support of progressive taxation	Inequality perception; age; gender; Education (in years); Personal income; Tolerance of inequality; Inequality perception \times personal income; Employment status; Individual's self-positioning
Kuhn, (2011)	International Social Survey Programmes (ISSP) Social Inequality database; Switzerland (593 observations)	1999	Linear regression	Subjective evaluation of wage inequality (market justice evaluation)	Beliefs (effort counts; each according to his needs; imputed/acquired abilities count); personal motives (income, mobility, dissatisfaction with income)
Cruces et al. (2013)	Survey on Distributional Perceptions and Redistribution (1100 representative household) Buenos Aires, Argentina	2009	Regression with neighbourhood fixed effects	Perceived own-income decile	Objective income decile; Rank within locality; Has friends from all social classes; Interaction: Locality rank & friends variable
Bussolo et al. (2021)	International Social Survey Programme (ISSP); 9–26 countries, depending on the year (1000 to 2000 observations per country-year)	1987, 1992, 1999, 2009	Logistic regression (multinomial ordered logit model)	1. Inequality perceptions 2. Demand for redistribution	Ideology, economic context (Gini, poverty, unemployment, expenditure on education), individual circumstances (age, gender, employment status, education, income)

Table 1 (continued)

Source	Database/sample	Time range	Method	Dependent variable	Independent variables
Grosfeld and Senik (2010)	CBOS in Poland (six representative surveys per year; 1000–1300 individuals per survey)	1992–2005	Logistic regression (multinomial ordered logit model)	Country satisfaction (as a proxy of attitude to inequalities)	Gini, individual characteristics (age, age squared, gender, education, occupation, labour market status, household income per capita and residential location), year x region dummies

The dataset used in the study not only contains up-to-date information on the subject of the research (in contrast to the analyses of Czerniak, Graca-Gelert, and Luczyn (2018), which use information only up to 2015, or the others, which go back to 2009 in their time scope; Table 1), but also has not been the basis of previous analyses of acceptance for income inequality. Moreover, the nature of the questions included in the survey allowed for the development of variables that accurately measure the level of the categories that are the subject of the survey—especially acceptance for income disparity, as we discuss below.

3.2 Dependent Variable

The answer to question 7 ‘The income gap between the rich and the poor is too large in Poland’ [*inequal*] is used to measure acceptance of the current level of income inequality. Acceptance of inequality is thus an ordinal variable, measured on a 5-point scale that is coded so that 1 means ‘Strongly agree’, 2—‘Rather agree’, 3—‘Difficult to say’, 4—‘Rather disagree’, 5—‘Strongly disagree’. The higher the value of the variable, the greater the acceptance for income disparity.

The measurement of acceptance for income inequality based on a direct question about the attitude towards income disparities is a novelty as compared to previous research conducted in Poland. The existing analyses dealt with the perception of (instead of acceptance for) inequality (Bussolo et al., 2021) or acceptance for inequality was measured through a proxy in the form of attitudes towards redistribution or poverty (Czerniak, Graca-Gelert and Luczyn, 2018).

According to the variable distribution information presented in Appendix 1, almost 75% of respondents believe that income inequality in Poland is too high, with over 40% of respondents strongly disapproving of income disparity. This situation is in line with previous research on the addressed issue, e.g. the most recent analysis available in the literature—Czerniak et al. (2018), who referred to data from 2015.

Missing data represent less than 1% of observations. Individuals for whom the value of the variable could not be measured (due to non-responsiveness) were excluded from further analysis.

3.3 Independent Variables

The choice of explanatory variables is justified by the literature cited in the previous section of the paper. Dummies were created for the categorical variables, which are more convenient in interpretation in the case of the probit model used in the analysis (the rationale for using this type of model is included below).

The empirical model includes the following independent variables:

- Socio-economic perspectives
 - [*sex*] Sex (question I.1); dummy (1 – male)
 - [*age*] Age (question I.2); integer variable (measured in years)
 - [*loc_sm/loc_me1/loc_med2/loc_big*] Location (question II.1); 4 dummies:
 - Village, small town
 - Small medium town
 - Medium town
 - Big city

- Reference category: village (agriculture)
- [*voc/sec/high*] Education (question II.3); 3 dummies:
 - Vocational
 - Secondary
 - Higher
 - Reference category: elementary
- Socio-economic status
 - [*unemployment*] Unemployment status (question II.4); dummy (1—unemployed)
 - [*cat1/cat2/cat3/cat4*] Monthly household income per person (question III); 4 dummies:
 - Category 1 (PLN 1001–2000)
 - Category 2 (PLN 2001–3000)
 - Category 3 (PLN 3001–5000)
 - Category 4 (PLN 5001 +)
 - Reference category: up to 1000
- Attitudes:
 - [*empowerment*] empowerment (question 9); dummy (1—answer Rather Yes, Definitely Yes; 0—other answers); 1 means no/low sense of empowerment
 - [*conservative*] conservative worldview (question 49); dummy (1—answer Rather Yes, Definitely Yes; 0—other answers); 1 indicates a conservative worldview
 - Political views (question IX); 2 dummies:
 - [*leftist*] Leftist views: 1—extreme left or left or centre-left;
 - [*rightist*] Rightist views: 1—extreme right or right or centre-right;
 - Reference category: views other than left-wing or right-wing.
 - [*redistribution8*] Attitude towards redistribution (question 8; opinion on the necessity of the state's redistributive function); ordinal variable—categories from 1 to 5; the higher the value, the higher the support for the state's redistributive function. It is worth noting that in measuring attitudes toward redistribution we use responses to a similar question as in the commonly used ISSP (e.g., the important study of perception of inequality and demand for redistribution (Bus-solo et al., 2021))
 - [*redistribution15*] Attitude towards redistribution II (question 15; opinion on the necessity of income equalization through a progressive tax); ordinal variable—categories from 1 to 5; the higher the value, the greater the acceptance for progressive taxation. This variable will be used in robustness check – 2 models will be estimated: (1) including the variable based on question 8, (2) including the variable based on question 15. The results of the correlation analysis (with the significance test) for these two variables, among others, are discussed further in the text.
- Interactions:
 - [*empowerment*sex*]
 - [*empowerment*age*]
 - [*empowerment*cat4*]

- [high*cat4]
- [S80S20] actual level of income inequalities, measured by income quintile share ratio S80/S20 by Polish voivodships; this is the only variable in the model that is not observed on individual but on regional level. We decided to include the actual level of income inequalities in the model as suggested by Knell and Stix (2020) who find that acceptance for income disparities is impacted by real level of the latter. This variable can cause endogeneity issues, so the problem was diagnosed accordingly.

Moreover, we control for a fact if a person is a recipient of the child benefit PLN 500 that was mentioned in the introduction as a part of an extensive programme of financial support for children (as mentioned, the programme strongly influenced attitudes to income inequalities). For this purpose we use a dummy [*child_benefit*] (1—recipient of child benefit) created based on the following criteria: a person needs to have at least 3 persons in a household, be married, be of age between 18 and 55. As indicated by Finseraas (2008), we also include a second control variable in the model: the number of household members (integer variable) [*HH_members*].

A table with counts for each category of independent variables measured on individual level is included in Appendix 1. For each category of individual independent variables, we have sufficient number of observations to make inferences using the empirical model. For none of the independent variables (and the independent variable discussed earlier, Appendix 1) does the number of missing data exceed 50, so that the loss of information due to non-responsiveness is not large. Therefore, in the further part of the research procedure it was decided to discard observations for which data were missing for even one of the variables. Referring to the missing data information for the dependent variable and the independent variables, it should be noted that the empirical models will be estimated using at least 1,989 observations.

According to the results of the correlation analysis, presented in Table 2, the independent variables that are significantly related to the acceptance for income inequality are: gender, age, education level, income level, sense of empowerment and variables measuring support for the redistributive role of the state. These results are mostly supported by the results of χ^2 test (Appendix 2)—the only exception being the significant association of rightist attitudes with acceptance for income inequality.

Some of the factors that were indicated as significant in the other research (cited in the previous section of the paper) are not related to the acceptance for income dispersion. The reason for the latter may be the aforementioned difference in the construction of the dependent variable in relation to previous research carried out in this area—as indicated above, in previous studies the acceptance for income inequality was measured using semi-accurate indicators, e.g. attitudes towards redistribution. The results obtained here will be verified in the next section of the study, using an empirical model that will also allow us to determine the nature and compare the strength of the impact of individual factors on the explained variable.

Within the correlation analysis, the already mentioned issue of endogeneity should be raised again, as the problem has not been taken into account by the authors of previous studies concerning factors affecting the acceptance for income inequality. The variables measuring support for redistribution are significantly correlated not only with the level of acceptance for inequality, but also with some independent variables, specifically gender, age, education level, income level and sense of empowerment. Hence, the problem of endogeneity seems to be unavoidable. That fact was tentatively confirmed by the estimation of

Table 2 Correlation analysis – Spearman coefficients with corresponding significance test

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Inequalities	1.000											
(2) Sex	0.081***	1.000										
(3) Age	-0.143***	-0.051*	1.000									
(4) Location_small	-0.014	-0.012	0.013	1.000								
(5) Location_medium1	0.030	0.033	0.001	-0.227***	1.000							
(6) Location_medium2	0.023	0.016	-0.023	-0.199***	-0.116***	1.000						
(7) Location_big	0.025	-0.016	0.001	-0.371***	-0.217***	-0.190***	1.000					
(8) Vocational	-0.097***	0.116***	0.213***	0.016	0.038	0.001	-0.124***	1.000				
(9) Secondary	-0.026	0.001	-0.078***	0.020	-0.038	0.015	-0.046*	-0.331***	1.000			
(10) Higher	0.092***	-0.100***	-0.142***	-0.022	0.014	-0.000	0.177***	-0.373***	-0.662***	1.000		
(11) Unemployment	-0.010	0.014	-0.033	-0.018	-0.026	-0.004	-0.013	0.028	-0.018	-0.002	1.000	
(12) cat1	-0.133***	-0.034	0.101***	0.014	0.016	-0.010	-0.115***	0.136***	0.027	-0.159***	0.022	1.000
(13) cat2	0.060**	0.003	-0.028	0.033	-0.004	0.040	0.039	-0.098***	-0.008	0.117***	-0.059**	-0.475***
(14) cat3	0.059**	0.027	-0.072**	0.018	-0.020	0.005	0.105***	-0.104***	-0.046*	0.140***	-0.036	-0.334***
(15) cat4	0.129***	0.043	-0.039	-0.045*	0.002	0.007	0.102***	-0.077***	-0.047*	0.119***	-0.016	-0.225***
(16) Empowerment	-0.236***	-0.109***	0.141***	-0.004	0.011	-0.041	0.011	0.047*	0.032	-0.056*	0.033	0.036
(17) Conservative	0.010	0.079***	0.180***	0.007	-0.018	0.016	-0.063**	0.118***	0.016	-0.153***	0.003	0.052*
(18) Leftist	-0.003	-0.012	0.014	-0.014	0.016	0.010	0.081***	-0.081***	-0.043	0.112***	-0.058*	-0.058*
(19) Rightist	-0.033	0.117***	0.045*	-0.013	-0.006	-0.038	-0.028	0.063**	0.013	-0.069**	0.001	-0.021
(20) Redistribution8	-0.605***	-0.077***	0.095***	0.006	-0.012	-0.038	-0.038	0.140***	0.036	-0.134***	0.039	0.108***
(21) Redistribution15	-0.341***	-0.044*	0.181***	0.025	-0.013	-0.063**	-0.029	0.071**	0.030	-0.082***	0.008	0.097***
(22) HH_members	0.033	0.062**	-0.251***	-0.015	-0.045*	-0.063**	-0.151***	-0.017	0.040	-0.030	0.013	0.061**
(23) Child_benefit	0.010	0.030	-0.157***	-0.006	0.005	0.008	-0.039	0.001	-0.089***	0.137***	0.002	-0.020
(24) S80S20	-0.021	-0.004	0.009	-0.035	-0.063**	-0.116***	0.142***	-0.023	-0.031	0.051*	0.008	0.033
Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) Inequalities												
(2) Sex												

Table 2 (continued)

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(3) Age												
(4) Location_small												
(5) Location_medium1												
(6) Location_medium2												
(7) Location_big												
(8) Vocational												
(9) Secondary												
(10) Higher												
(11) Unemployment												
(12) cat1												
(13) cat2	1.000											
(14) cat3	-0.277***	1.000										
(15) cat4	-0.186***	-0.131***	1.000									
(16) Empowerment	0.007	-0.063**	-0.056*	1.000								
(17) Conservative	-0.052*	-0.066**	-0.052*	0.068**	1.000							
(18) Leftist	0.044	0.056*	0.069**	0.009	-0.136***	1.000						
(19) Rightist	0.007	0.004	-0.038	-0.023	0.166***	-0.363***	1.000					
(20) Redistribution8	-0.043	-0.079***	-0.122***	0.322***	0.022	-0.009	0.026	1.000				
(21) Redistribution15	-0.025	-0.075***	-0.099***	0.196***	0.027	0.016	0.026	0.361***	1.000			
(22) HH_members	-0.086***	-0.102***	0.015	-0.028	-0.001	-0.078***	0.083***	0.013	-0.030	1.000		
(23) Child_benefit	0.028	-0.037	0.027	-0.043	-0.061**	-0.026	0.018	-0.011	-0.053*	0.454***	1.000	
(24) S80S20	-0.006	-0.019	0.006	0.050*	0.032	-0.029	0.040	0.034	0.007	0.027	0.029	1.000

* Indicates significance at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

probit models with and without redistribution variable (Appendix 3). As a matter of fact, we note more significant relations between acceptance for inequalities and certain independent variables in the model without redistribution variable, which could suggest that confidence was increased because of removing the latter from the model.

Omitting the redistribution variable will then cause the error term to be correlated with the independent variables—we will then be facing the omitted variable bias. On the other hand, including the redistribution variable in the model will cause a situation in which the relationship between the dependent variable and one of the independent variables will be bidirectional, which is also the cause of endogeneity problems and leads to incorrect results. That is why we have chosen the method of model estimation that reduces the negative consequences of this phenomenon—GSEM (see Methods subsection for details).

Interestingly, variable *S80S20* measuring actual level of income inequalities, is not significantly correlated with acceptance for income inequalities. Moreover, the correlation is not significant for most of the remaining independent variables (with an exception of the ones related to location). Endogeneity problem does not seem to be occurring for *S80S20* then. It is confirmed by the similar procedure as the one performed by redistribution variable. According to the results provided in Appendix 3, exclusion of the *S80S20* from the model does not result in substantial increase of significance of the remaining variables. It can be then stated that this indicator is not of endogenous nature.

It is justifiable to include in the model an interaction variable concerning the relationship between sense of empowerment and gender, age and high income. Also noteworthy is the statistically significant correlation between variables determining attitudes toward redistribution, suggesting that respondents are aware of the relationship between the state’s redistributive function and a need for progressive taxation. However, the strength of this relationship is moderate, which suggests that the results of estimating the empirical model using each of the variables separately may differ. Therefore the second variable will serve for robustness check.

In the further research procedure the independent variables were grouped in a way that reflects the structure of the hypotheses and enables their logical and correct verification. In this context the below model (1) should be assumed. However, due to the problem of endogeneity of the variable measuring attitudes towards redistribution, the final form of the model was modified – details are presented later in the text—model (2).

$$\begin{aligned}
 \text{inequal}_i = f(& \text{unemployment}_i + \text{cat1}_i + \text{cat2}_i + \text{cat3}_i + \text{cat4}_i \\
 & \text{ socio – economic status} \\
 + & \text{sex}_i + \text{age}_i + \text{loc}_{smi} + \text{loc}_{med1i} + \text{loc}_{med2i} + \text{loc}_{bigi} + \text{voc}_i + \text{sec}_i + \text{high}_i \\
 & \text{ socio – economic perspectives} \\
 + & \text{empowerment}_i + \text{conservative}_i + \text{leftist}_i + \text{rightist}_i + \text{redistribution8}_i \\
 & \text{ attitudes} \\
 + & \text{empowerm} * \text{sex}_i + \text{empowerm} * \text{age}_i + \text{empowerm} * \text{cat4}_i + \text{high} * \text{cat4}_i \\
 & \text{ interaction variables} \\
 + & \text{HH_members}_i + \text{child_benefit} + \text{S80S20} + u_i \\
 & \text{ control}
 \end{aligned}
 \tag{1}$$

3.4 Methods

In order to account for the phenomenon of endogeneity, the authors considered various possibilities that would allow to attenuate the negative consequences of this phenomenon. For endogeneity problems in situations where the explanatory variable is non-continuous, a linear probability model with instruments (using 2SLS or IV-GMM estimators) is common. Its primary weakness is that the error term is not independent of the regressor matrix unless it consists of a single binary regressor, which is not the case here. The control function approach is also quite popular. This alternative, however, requires the endogenous regressor to be a continuous variable, rather than discrete or binary. Otherwise the assumptions that are crucial to accurately estimate the ‘first stage’ error term are violated. The use of the control function based approach additionally requires that ‘first stage’ models are correctly specified (all appropriate instruments need to be included). Otherwise, the 2SLS estimator used in this approach is no longer effective.

Therefore, we decided to apply the Generalized Structural Equation Modelling (GSEM) approach, which uses a maximum likelihood estimator and allows for situations where the endogenous regressor is a discontinuous variable. In this approach, the equation for the key dependent variable and the endogenous variable are estimated simultaneously (rather than in two steps as in the approaches indicated above). In addition, the GSEM approach allows the introduction into the equations of variables (often referred to as latent variables) that are not directly measurable, yet, through their observable effects, influence the relationship between the variables of interest.

In the framework of the research procedure we assume the below model with two equations—model (2) below. The list of excluded instruments includes variables, which according to the results of correlation analysis (Table 2) are not significantly correlated with the key dependent variable (*inequal*). The exceptions are variables measuring conservative attitudes and leftist views, which were not included in the excluded instruments group. These regressors were selected based on the literature review and are key variables to verify the hypotheses.

$$\begin{aligned}
 \text{inequal}_i &= f(\text{redistribution8}_i + \text{cat1}_i + \text{cat2}_i + \text{cat3}_i + \text{cat4}_i \\
 &\quad + \text{sex}_i + \text{age}_i + \text{voc}_i + \text{high}_i + \text{empowerment}_i + \text{conservative}_i \\
 &\quad + \text{leftist}_i + \text{empowerment} * \text{sex}_i + \text{empowerment} * \text{age}_i \\
 &\quad + \text{empowerment} * \text{cat4}_i + \text{high} * \text{cat4}_i + \text{HH_members}_i \\
 &\quad + \text{child_benefit} + \text{S80S20}) + u_i \\
 \text{redistribution8}_i &= g(\text{unemployment}_i + \text{cat1}_i + \text{cat2}_i + \text{cat3}_i + \text{cat4}_i \\
 &\quad + \text{sex}_i + \text{age}_i + \text{loc_sm}_i + \text{loc_med1}_i + \text{loc_med2}_i + \text{loc_big}_i + \text{voc}_i \\
 &\quad + \text{sec}_i + \text{high}_i + \text{empowerment}_i + \text{conservative}_i + \text{leftist}_i \\
 &\quad + \text{rightist}_i + \text{empowerment} * \text{sex}_i + \text{empowerment} * \text{age}_i \\
 &\quad + \text{empowerment} * \text{cat4}_i + \text{high} * \text{cat4}_i + \text{HH_members}_i \\
 &\quad + \text{child_benefit} + \text{S80S20}) + v_i
 \end{aligned} \tag{2}$$

Due to the design of the explanatory variable and the variables used to measure attitudes toward redistribution (ordinal variables), each of the system equations is estimated using a polynomial ordered probit model. Following the GSEM methodology, a latent variable is

introduced into each equation to model the correlation between the error terms. Variance of the latent variable was constrained to 1. To reduce the negative effects of heteroskedasticity, robust standard errors were used in model estimation. Variable S80S20 which is the only one measured regionally is treated as the second-level variable in the model.

As part of the model verification, the amount of information that the independent variables contribute to the model was assessed—a separate model was estimated for each group of explanatory variables (see the breakdown of independent variables indicated in the Data and Methods section). Information criteria (AIC, BIC, log-pseudolikelihood) were compared for the overall model and models with different sets (groups) of independent variables. Comparing the results from each model also allowed us to examine the stability of the results, i.e. to see whether the exclusion of given groups of independent variables affects the significance of the effect of the independent variables on the dependent and the direction of that effect. Conclusions regarding the influence of independent variables on the dependent variable were drawn on the basis of significance test for individual explanatory variables. For variables defining income group and level of education an additional Wald test of joint significance was conducted.

4 Results

Based on the results presented in Table 3, we conclude that the inclusion of interaction variables in the model is not justified. Only one variable is statistically significant, the relationship is weak though. Moreover, model (2), not including interaction variables, is characterized by higher quality, as proved by the values of AIC and BIC.

Model (2) is of higher quality also in comparison to models (3–5), which consider each group of independent variables separately. This fact is confirmed by the analysis of log-pseudolikelihood values and AIC and BIC information criteria. The inclusion of all proposed groups of explanatory variables in the model is then justified. Therefore, the verification of the research hypotheses was based on model (2). All interpretations refer to Eq. 1 of the model (2), referring to the direct (not mediated by attitudes towards redistribution) effect of individual categories on acceptance for income inequality.

Acceptance for inequality is significantly affected by independent variables from each of the analysed groups. The results of the joint significance test for the income variable indicate that this category significantly affects acceptance for inequalities. The detailed results allow us to conclude that those in the highest income group are significantly more likely to have a higher acceptance for inequality compared to those in the lowest income group. Higher socioeconomic status is then associated with higher acceptance for inequality, but only in the context of income, which means that hypothesis 1a can be considered partially confirmed.

Older people are more likely to have a lower score of acceptance for income inequality. No significant influence of other categories determining socio-economic perspectives on the examined phenomenon is observed. Hypothesis 1b can therefore be considered partially confirmed.

Hypothesis 2a should be rejected—people with lower sense of empowerment are characterized by higher acceptance for income inequality. Similarly, individuals with conservative views on social life are more likely to accept income inequalities. Therefore, hypothesis 2b should be rejected. Hypothesis 2c should be rejected as well, as leftist views have no significant influence on acceptance for income inequalities.

Table 3 GSEM estimations, equation for *inequal*; *redistribution8* as a measure of attitude towards redistribution

	Dependent variable: <i>inequal</i>				
	(1)	(2)	(3)	(4)	(5)
Independent variables					
Income—cat1	-0.04365 (0.092)	-0.03768 (0.092)	0.21473 (0.228)		
Income—cat2	0.15760 (0.098)	0.17031 (0.097)	1.04875*** (0.277)		
Income—cat3	0.13953 (0.107)	0.15416 (0.107)	1.31428*** (0.323)		
Income—cat4	0.52978** (0.194)	0.37062** (0.122)	2.04187*** (0.408)		
Sex	0.09816 (0.086)	0.06506 (0.053)		0.73168*** (0.169)	
Age	-0.00695* (0.003)	-0.00674*** (0.002)		-0.02079*** (0.005)	
Vocational	0.04005 (0.081)	0.03291 (0.080)		-0.63800** (0.229)	
Higher	0.03182 (0.062)	-0.00739 (0.059)		0.54966** (0.171)	
Empowerment	-0.13323 (0.171)	-0.11923* (0.057)			-1.99486*** (0.380)
Conservative	0.17346** (0.060)	0.16786** (0.060)			0.20159 (0.148)
Leftist	-0.03469 (0.064)	-0.03781 (0.064)			0.02977 (0.162)
Redistribution8	-0.60443*** (0.024)	-0.60315*** (0.024)	0.72178*** (0.207)	0.73548*** (0.217)	0.84558*** (0.253)

Table 3 (continued)

	Dependent variable: inequal				
	(1)	(2)	(3)	(4)	(5)
Empowerment*sex	-0.05233 (0.107)				
Empowerment*age	0.00068 (0.003)				
Empowerment*cat4	0.10297 (0.181)				
Higher*cat4	-0.37140* (0.187)				
HH_members	0.04273* (0.021)	0.04293* (0.021)	0.09126 (0.052)	-0.01193 (0.053)	0.02003 (0.052)
Child_benefit	-0.07083 (0.064)	-0.06544 (0.064)	-0.05835 (0.156)	-0.08573 (0.160)	0.01459 (0.159)
S80S20	-0.01741 (0.061)	-0.02008 (0.061)	-0.20352 (0.154)	-0.30193 (0.159)	-0.15281 (0.155)
L	0.00000 (0.112)	0.00000 (0.110)	2.51760*** (0.336)	2.54477*** (0.353)	2.60292*** (0.399)
Income—joint significance	35.01***	49.31***	36.68***		
Education—joint significance	27.40***	30.49***		30.96***	
log pseudolikelihood	-4864.06	-4869.23	-5076.62	-5040.07	-5076.94
AIC	9834.12	9828.46	10,203.23	10,138.13	10,199.89
BIC	10,130.70	10,080.28	10,343.57	10,300.89	10,329.37
N	1990	1990	2025	2023	2058

Robust standard errors in parentheses

*Indicates significance at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As expected, individuals with higher support for redistribution are more likely to have lower acceptance for income inequality. Hypothesis 3 can therefore be considered confirmed.

Basically, the estimations performed within robustness check procedure, i.e. for the alternative variable measuring support for redistribution (*redistribution15*; results in Appendix 4), give similar results in terms of deciding on the truth of the research hypotheses. Generally, the results could be then considered as robust.

From the control variables the only one that affects level of acceptance for income inequalities is number of persons in the household. Actual level of income inequalities seem not to have an influence on the category of interest. The reason of such a result can be purely technical—the variability of actual income inequality level was quite low which had an impact on estimations. Small changes in observations can lead to inference on insignificant relationships between variables.

5 Discussion and Conclusions

One of the most important contributions of the study is taking the phenomenon of endogeneity into account, which responds to the problem stressed by Bussolo et al. (2021) in the context of the analysis and interpretation of factors affecting the acceptance for income inequality. Endogeneity is related, inter alia, to the high correlation of the variable measuring attitudes towards redistribution with the explanatory variable and, simultaneously, with a large part of the explanatory variables, which made it impossible to exclude this variable from the study due to omitted variable bias. The existence of an impact of perceptions or acceptance for inequality on attitudes towards redistribution was already proved by Cruces et al. (2013) and Hauser and Norton (2017). This study confirmed the significance and nature of the relationship between the two categories (García-Sánchez, 2020). However, the relationship was also found to be bidirectional, which influenced the choice of model estimation method (GSEM incorporating endogeneity) underlying the inference and the results. The study found that some of the variables affect acceptance for income inequality indirectly—through attitudes towards redistribution. This is consistent with other researchers who, in their studies of factors affecting acceptance for income inequality and attitudes towards redistribution, distinguished the same determinants of mentioned categories, such as age, political views (Bussolo et al., 2021) or level of education (Cusack et al., 2006; Iversen & Soskice, 2001).

As already stated, a factor that has a relatively strong influence on the acceptance for income inequality is the belief that the state should be characterised by an extensive social sphere. In previous studies for Poland, social class (Wysieńska, 2014), age, education and income were the crucial factors (Czerniak et al., 2018). Studies for other countries confirm the importance of income in the perception of income inequality (Bussolo et al., 2021). It is also worth noting that the set of factors influencing the acceptance for income inequality may vary across countries due to variations in cultural backgrounds (Bavetta et al., 2019). This accounts for the differences between the results obtained by other authors and the results of the study conducted in this paper.

In particular, it is worth underlining that Poland belongs to the group of countries where a significant political transformation took place in the early 1990s, moving away from the socialist system, which was characterised by relative income equality, towards a free market economy. Thus, for some respondents, especially from older age

categories, the phenomenon of income inequality was a new experience, learned only during the transition (Grosfeld & Senik, 2010).

The results of the conducted study indicated that older respondents are currently still less willing to accept inequality, which is in line with the results of studies conducted for Poland for earlier periods (before 2012) (Czerniak et al., 2018). The gradual decline in labour market competitiveness with age (with few exceptions), experienced especially by older people whose main economic activity was related to paid employment, may be significant. In addition, in the case of Poland, but also in many other countries, the main source of income for the elderly are funds obtained from social transfers (pensions) and assets—real estate used for housing purposes (Warchlewska & Iwański, 2020). As a consequence, they are worse off in relation to the rest of the population. Differences in risk-aversion are also noticeable—older people are more risk-averse compared to younger people. In turn, risk proneness may be important in terms of perceived inequality (Borghans et al., 2009).

In the presented study, gender was not a statistically significant variable, which is not consistent with the findings of other analyses (Bavetta et al., 2019; Kuhn, 2019). This may be due to the fact that it is rather other variables, correlated with gender, that influence attitudes towards income inequality. Perceptions of inequality for women may depend, inter alia, on political views. Middle-aged women with leftist views are more likely to pay attention to income inequality (Bavetta, 2019). Bussolo et al. (2021) indicated that those with poorer life perspectives and lower socioeconomic status, among others, older women, are less likely to accept the existence of income inequality.

In this context, it is worth noting that the results of the research conducted here found that people with higher incomes (i.e. better socioeconomic status) are more likely to accept income inequality, which is in line with the results of Czerniak et al. (2018) for Poland. Also, studies for samples covering more countries confirm that better-off individuals are more willing to accept income differentiation than poorer people (Corneo & Grüner, 2002; Meltzer & Richard, 1981; Suhrcke, 2001).

Importantly, according to the results of the analyses, education does not significantly affect the acceptance for income inequality, while place of residence differentiates attitudes towards income differentiation only through attitudes towards redistribution. The study by Czerniak et al. (2018) indicates that these variables are significant in shaping the evaluation of the legitimacy of income inequality, with education characterised by a stronger influence on the category under study.

The reason for the differences in the results of the conducted study (data from 2019) and the aforementioned study (data up to 2012 at most), in terms of the differentiation of attitudes towards inequality depending on the place of residence, may be due to the significant social changes that have been observed in Poland since its accession to the European Union structures. Since then, income differences between inhabitants of urban and rural areas have been decreasing. This is due not only to the high level of investment in rural areas but also to the system of subsidies for agricultural production, which is particularly experienced by those employed in this sector of the economy. This contributes to eliminating disparities in the quality and comfort of life. What is more, rural areas in Poland are being transformed due to changes in the structure of employment. The number of people working in agriculture is decreasing. Some rural areas are losing their original agricultural character and are becoming places of residence for people who work in nearby towns. Thanks to this, the unemployment rate (which has always been higher in rural areas) has been falling dynamically over recent years, resulting in an increase in the average income of rural residents. In addition, constant contact between the inhabitants of rural areas and

urban communities blurs cultural differences, including those concerning the perception of social phenomena.

It is indicated that in Poland education is more strongly related to attitudes towards redistribution than to acceptance of inequality. Education is significantly associated with support for the redistributive policy of the state. In this case, it should be noted that in the case of the implementation of the universal benefit for the family (that was mentioned in the Introduction and took place in 2016), the highest support for this costly programme from the perspective of the state budget was in the group of people with lower education. Support for lowering the retirement age in 2018 had a similar pattern. This may be due to the nature of their work, the amount of income they receive, and their ability to change their material situation.

Research by Grosfeld and Senik (2010) indicates that perceptions of income disparity are also influenced by political views. People with rightist views are more likely to consider income inequality as a consequence of greater opportunities in the labour market. Unequal income distribution is perceived by those with rightist views as a natural phenomenon occurring in a free market economy. In contrast, those with leftist views tend to perceive the phenomenon of income inequality unfair. Supporters of a left wing often consider income disparities as an undesirable effect of economic processes (Alesina & Giuliano, 2009; Alesina et al., 2004). It was not confirmed by the results of the research conducted in this paper, as left-wing attitudes occurred to be insignificant in terms of influence on acceptance for income inequalities. Explanation can be found in way by which the political views are shaped in Poland. Different streams are often mixed, and the delimitation between certain concepts is not transparent. Importantly, rightist views are often strongly related to conservative worldview. Besides, both are confused with each other. It can be then the conservative attitude that 'took over' the significance of leftist-rightist placement when it comes to the influence on acceptance for income inequalities (referring to the results presented in the previous section of the paper). The latter is higher for conservative, i.e. in Poland—rightist, individuals. Hence, support for non-conservative, and simultaneously left-wing, views is related to lower acceptance for income inequalities, which stays in line with the research available in the literature.

The study presented in this paper confirmed the relationship between acceptance for income inequalities and support for redistribution. Goñi et al. (2011) indicate that the perception of inequality is reflected in the extent of acceptance or lack of acceptance for redistribution programmes and the role of the state in the economy, including the amount of funds available for transfers and the tax system in a given country. Depending on the adopted model, attitudes towards redistribution can be considered as one of the means to ensure social stability change (Falkinger, 1999). Mostly, it is those who do not accept inequality who demand measures to support disadvantaged groups and to take measures that disadvantage better-off groups (Crawford et al., 2015).

To conclude, in the situation when the income inequalities are rising or staying at the same but relatively high level, it is worth studying the acceptance for this phenomenon. Such a study can be an important premise to support decision-making in the field of income redistribution policy. Our research revealed that socio-economic status and perspectives as well as worldview and attitudes towards support for redistribution significantly influence level of acceptance for income inequalities. Individuals with lower income, older, supporting redistribution and with non-conservative views are less likely to accept income disparities. Such conclusions are in line with the previous studies on the topic.

Obviously, the results of the research should be interpreted with care. Firstly, the use of microdata obtained through the surveys mentioned in the text carries certain limitations

due to their nature and the need to aggregate and process data for the analyses conducted. The results of the analysis presented here may provide a comparative background for other studies on inequality, especially those based on similar types of data from other countries. Secondly, some of the variables did not provide a fully accurate measure of the factors influencing acceptance for income inequality. In particular, the questions referring sense of empowerment and conservative views only provided an approximation of the level of these categories.

The subject of further research should be a thorough analysis of the interrelationships between the determinants of acceptance for income inequality included in this study. Of particular interest seems to be the impact of these interdependencies on the attitudes towards income stratification themselves. It would also be useful to determine the level of income inequality for which individual factors are important in shaping acceptance for income differentiation. This would be possible through comparative studies for various cultural contexts.

Appendix 1 Counts

Inequal			Frequency	Share (%)	
1			899	42.47	
2			651	30.75	
3			339	16.01	
4			158	7.46	
5			58	2.74	
Missing data			12	0.57	
Total			2117	100.00	

Sex	Freq	Share (%)	Location	Freq	Share (%)
0	1109	52.39	village—agricultural character	518	24.47
1	1008	47.61	small town (<i>loc_sm</i>)	592	27.96
Missing data	0	0.00	City of population 20,000—100,000 (<i>loc_med1</i>)	247	11.67
Total	2117	100.00	City of population 100 000—200,000 (<i>loc_med2</i>)	200	9.45
			City of population 200,000 or more (<i>loc_big</i>)	560	26.45
Age	Freq	Share (%)	Missing data	0	0.00
18	6	0.28	Total	2117	100.00
19	15	0.71			
20	44	2.08	Education	Freq	Share (%)
21	36	1.70	Elementary	95	4.49
22	41	1.94	Vocational (<i>voc</i>)	337	15.92
23	33	1.56	Secondary (<i>sec</i>)	771	36.42
24	31	1.46	Higher (<i>high</i>)	877	41.43
25	66	3.12	Missing data	37	1.75
26	52	2.46	Total	2117	100.00
27	41	1.94			
28	49	2.31	Unemployment	Freq	Share (%)
29	32	1.51	0	2,088	98.63

Sex	Freq	Share (%)	Location	Freq	Share (%)
30	42	1.98	1	29	1.37
31	15	0.71	Missing data	0	0.00
32	33	1.56	Total	2,117	100.00
33	23	1.09			
34	31	1.46	Income	Freq	Share (%)
35	47	2.22	Up to 1000	226	10.68
36	50	2.36	1001–2000 (cat1)	763	36.04
37	32	1.51	2001–3000 (cat2)	583	27.54
38	47	2.22	3001–5000 (cat3)	341	16.11
39	24	1.13	5001 and more (cat4)	170	8.03
40	53	2.50	Missing data	34	1.61
41	40	1.89	Total	2,117	100.00
42	51	2.41			
43	28	1.32	Empowerment	Freq	Share (%)
44	34	1.61	0	742	35.05
45	43	2.03	1	1,375	64.95
46	26	1.23	Missing data	0	0.00
47	42	1.98	Total	2,117	100.00
48	35	1.65			
49	24	1.13	Conservative	Freq	Share (%)
50	58	2.74	0	1,525	72.04
51	17	0.80	1	592	27.96
52	27	1.28	Missing data	0	0.00
53	37	1.75	Total	2,117	100.00
54	15	0.71			
55	57	2.69	Leftist/rightist	Freq	Share (%)
56	45	2.13	Leftist = 1	445	21.02
57	36	1.70	Rightist = 1	694	32.78
58	44	2.08	Leftist = 0 and rightist = 0	978	46.20
59	37	1.75	Missing data	0	0.00
60	43	2.03	Total	2,117	100.00
61	34	1.61			
62	28	1.32	Redistribution8	Freq	Share (%)
63	21	0.99	1	128	6.05
64	22	1.04	2	251	11.86
65	69	3.26	3	316	14.93
66	47	2.22	4	661	31.22
67	42	1.98	5	743	35.10
68	47	2.22	Missing data	18	0.85
69	30	1.42	Total	2,117	100.00
70	49	2.31			
71	15	0.71	Redistribution15	Freq	Share (%)
72	27	1.28	1	273	12.90
73	18	0.85	2	407	19.23
74	8	0.38	3	369	17.43
75	8	0.38	4	651	30.75

Sex	Freq	Share (%)	Location	Freq	Share (%)
76	13	0.61	5	407	19.23
77	8	0.38	Missing data	10	0.47
78	3	0.14	Total	2,117	100.00
79	4	0.19			
80	8	0.38	HH_members	Freq	Share (%)
81	3	0.14	1	278	13.13
82	5	0.24	2	561	26.50
83	3	0.14	3	462	21.82
84	3	0.14	4	484	22.86
85	5	0.24	5	206	9.73
86	4	0.19	6	63	2.98
87	1	0.05	7	12	0.57
88	1	0.05	8	9	0.43
89	2	0.09	24	1	0.05
90	2	0.09	Missing data	41	1.94
91	1	0.05	Total	2,117	100.00
92	2	0.09			
93	1	0.05	S80S20	Freq	Share (%)
Missing data	1	0.05	3.5	56	2.65
Total	2117	100.00	3.7	253	11.95
			3.8	251	11.86
Child_benefit	Freq	Share (%)	3.9	53	2.50
0	1533	72.41	4	118	5.57
1	584	27.59	4.1	329	15.54
Total	2117	100.00	4.2	95	4.49
			4.3	468	22.11
			4.4	79	3.73
			4.8	116	5.48
			5	299	14.12
			Total	2,117	100.00

Appendix 2. χ^2 test

Independent variable	Inequal					Total	χ^2
Sex	1	2	3	4	5	Total	
0	498	359	166	59	19	1101	30.123***
1	401	292	173	99	39	1004	
Total	899	651	339	158	58	2105	
Age	1	2	3	4	5	Total	χ^2

Independent variable	Inequal						χ^2
18–24	69	64	33	28	11	205	57.403***
25–34	126	126	82	32	15	381	
35–59	427	280	140	75	22	944	
60 and more	276	181	84	23	10	574	
Total	898	651	339	158	58	2,104	
Location	1	2	3	4	5	Total	χ^2
Village—agricultural character	242	150	77	33	14	516	22.197
Small town	257	179	87	56	8	587	
City of population 20,000—100,000	78	69	34	13	6	200	
City of population 100,000—200,000	89	85	43	19	9	245	
City of population 200,000 or more	233	168	98	37	21	557	
Total	899	651	339	158	58	2,105	
Education	1	2	3	4	5	Total	χ^2
Elementary	40	28	15	9	2	94	29.158
Vocational	172	97	41	14	8	332	
Secondary	340	233	124	52	19	768	
Higher	334	281	151	81	28	875	
Total	886	639	331	156	57	2,069	
Unemployment	1	2	3	4	5	Total	χ^2
0	886	641	336	156	57	2,076	0.823
1	13	10	3	2	1	29	
Total	899	651	339	158	58	2,105	
Income	1	2	3	4	5	Total	χ^2
up to 1000	108	74	28	7	5	222	87.401***
1001–2000	381	225	102	34	16	758	
2001–3000	228	175	109	55	14	581	
3001–5000	125	112	52	37	14	340	
5001 and more	41	57	40	23	9	170	
Total	883	643	331	156	58	2,071	
Empowerment	1	2	3	4	5	Total	χ^2
0	220	231	151	91	42	735	128.718***
1	679	420	188	67	16	1,370	
Total	899	651	339	158	58	2,105	
Conservative	1	2	3	4	5	Total	χ^2
0	643	479	250	109	36	1,517	4.971
1	256	172	89	49	22	588	
Total	899	651	339	158	58	2,105	
Leftist	1	2	3	4	5	Total	χ^2
0	705	516	270	119	51	1,661	4.350
1	194	135	69	39	7	444	
Total	899	651	339	158	58	2,105	
Rightist	1	2	3	4	5	Total	χ^2
0	587	445	252	101	29	1,414	18.254**
1	312	206	87	57	29	691	
Total	899	651	339	158	58	2,105	
Redistribution8	1	2	3	4	5	Total	χ^2

Independent variable	Inequal						χ^2
1	14	18	30	32	34	128	1211.457***
2	27	72	79	59	10	247	
3	58	114	114	28	2	316	
4	219	318	90	28	3	658	
5	575	124	24	11	6	740	
Total	893	646	337	158	55	2,089	
Redistribution15	1	2	3	4	5	Total	χ^2
1	71	65	57	49	29	271	377.570***
2	126	142	78	46	13	405	
3	116	133	87	24	5	365	
4	278	239	95	29	7	648	
5	302	70	21	10	3	406	
Total	893	649	338	158	57	2,095	

Dependent variables were not broken down into dummies, needed for the later probit model; data for the age variable was grouped into classes just for this test to be run—in further analyses age is used as an integer, as described in the Methods section; control variables were excluded from analysis.

*Indicates significance at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix 3. Ordinal probit models—diagnosis of endogeneity

	Dependent variable: inequal			
	(1)	(2)	(3)	(4)
<i>Independent variables</i>				
Sex	0.103 (0.086)	0.214* (0.083)	0.103 (0.086)	0.214* (0.083)
Age	-0.008** (0.003)	-0.010*** (0.003)	-0.007** (0.003)	-0.010*** (0.003)
Location_small	-0.037 (0.074)	-0.003 (0.071)	-0.036 (0.074)	-0.000 (0.071)
Location_medium1	0.127 (0.093)	0.146 (0.090)	0.127 (0.093)	0.149 (0.090)
Location_medium2	0.016 (0.102)	0.025 (0.099)	0.018 (0.101)	0.034 (0.098)
Location_big	-0.016 (0.079)	0.029 (0.076)	-0.017 (0.079)	0.025 (0.076)
Vocational	-0.071 (0.139)	-0.295* (0.134)	-0.071 (0.139)	-0.295* (0.134)
Secondary	-0.124 (0.132)	-0.221 (0.126)	-0.124 (0.132)	-0.221 (0.126)
Higher	-0.087 (0.136)	-0.113 (0.131)	-0.087 (0.136)	-0.115 (0.131)

	Dependent variable: inequal			
	(1)	(2)	(3)	(4)
Unemployment	0.135 (0.236)	0.008 (0.230)	0.135 (0.236)	0.007 (0.230)
Income—cat1	−0.035 (0.093)	−0.001 (0.090)	−0.035 (0.093)	−0.004 (0.090)
Income—cat2	0.185 (0.100)	0.282** (0.096)	0.184 (0.100)	0.280** (0.096)
Income—cat3	0.172 (0.109)	0.312** (0.105)	0.171 (0.109)	0.310** (0.105)
Income—cat4	0.533** (0.195)	0.675*** (0.189)	0.533** (0.194)	0.672*** (0.189)
Empowerment	−0.169 (0.172)	−0.679*** (0.166)	−0.169 (0.172)	−0.679*** (0.166)
Conservative	0.185** (0.061)	0.201*** (0.059)	0.185** (0.061)	0.199*** (0.059)
Leftist	−0.074 (0.068)	−0.088 (0.066)	−0.074 (0.068)	−0.086 (0.066)
Rightist	−0.104 (0.060)	−0.120* (0.058)	−0.104 (0.060)	−0.121* (0.058)
Empowerment*sex	−0.056 (0.108)	−0.117 (0.104)	−0.056 (0.108)	−0.117 (0.104)
Empowerment*age	0.001 (0.003)	0.005 (0.003)	0.001 (0.003)	0.005 (0.003)
Empowerment*cat4	0.113 (0.181)	0.041 (0.175)	0.114 (0.181)	0.045 (0.175)
Higher*cat4	−0.352 (0.187)	−0.178 (0.183)	−0.352 (0.187)	−0.181 (0.183)
HH_members	0.046* (0.022)	0.018 (0.020)	0.046* (0.022)	0.018 (0.020)
Child_benefit	−0.067 (0.064)	−0.050 (0.062)	−0.067 (0.064)	−0.052 (0.062)
Redistribution8	−0.604*** (0.024)		−0.604*** (0.024)	
S80S20	−0.009 (0.062)	−0.051 (0.059)		
Log pseudolikelihood	−2152.95	−2501.69	−2152.96	−2502.05
AIC	4365.90	5061.38	4363.92	5060.11
BIC	4533.64	5223.76	4526.07	5216.89
N	1981	1997	1981	1997

Robust standard errors in parentheses

*Indicates significance at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 4. GSEM estimations, equation for inequal, robustness check (redistribution15 as a measure of attitude towards redistribution)

	Dependent variable: inequal				
	(1)	(2)	(3)	(4)	(5)
<i>Independent variables</i>					
Income—cat1	0.00442 (0.090)	0.00675 (0.090)	0.20194 (0.204)		
Income—cat2	0.23712* (0.095)	0.24626** (0.095)	0.89565*** (0.228)		
Income—cat3	0.22421* (0.105)	0.23292* (0.104)	1.19213*** (0.264)		
Income—cat4	0.65433*** (0.190)	0.46980*** (0.120)	1.90048*** (0.333)		
Sex	0.17890* (0.084)	0.12708* (0.051)		0.52027*** (0.121)	
Age	-0.00660* (0.003)	-0.00393* (0.002)		-0.02663*** (0.005)	
Vocational	-0.10005 (0.078)	-0.11076 (0.078)		-0.36551* (0.171)	
Higher	0.09859 (0.060)	0.06342 (0.057)		0.37401** (0.129)	
Empowerment	-0.56587*** (0.166)	-0.41222*** (0.054)			-1.48548*** (0.192)
Conservative	0.17140** (0.058)	0.16665** (0.058)			0.07098 (0.130)
Leftist	-0.02528 (0.063)	-0.03255 (0.062)			-0.06892 (0.143)
Redistribution15	-0.25536*** (0.020)	-0.25351*** (0.020)	1.01426*** (0.204)	0.94537*** (0.214)	1.05387*** (0.205)
Empowerment*sex	-0.08649 (0.105)				
Empowerment*age	0.00436 (0.003)				
Empowerment*cat4	0.02278 (0.176)				
Higher*cat4	-0.32664 (0.184)				
HH_members	0.02023 (0.020)	0.02095 (0.020)	0.07196 (0.044)	-0.02794 (0.042)	0.02243 (0.043)
Child_benefit	-0.08338 (0.062)	-0.08200 (0.062)	0.12187 (0.141)	0.05438 (0.137)	0.16387 (0.142)
S80S20	-0.04675 (0.059)	-0.04724 (0.059)	-0.11167 (0.135)	-0.17220 (0.130)	-0.07023 (0.135)

	Dependent variable: inequal				
	(1)	(2)	(3)	(4)	(5)
L	0.00000 (0.148)	-0.00000 (0.150)	2.24483*** (0.295)	2.13504*** (0.305)	2.27651*** (0.295)
Income—joint significance Wald test— χ^2	40.02***	57.26***	50.44***		
Education—joint significance Wald test— χ^2	10.00	9.61		18.61***	
Log pseudolikelihood	-5453.65	-5460.94	-5650.22	-5617.38	-5704.82
AIC	11,013.30	11,011.87	11,350.44	11,292.77	11,455.64
BIC	11,310.15	11,263.91	11,490.89	11,455.67	11,585.22
N	2000	2000	2034	2033	2067

Robust standard errors in parentheses.

*Indicates significance at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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