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Inability to face unexpected expenses and monetary poverty in Poland: Are these two faces on the same coin?

JEL Classification: I32; C25

Keywords: *financial distress; monetary poverty; household; Shapley-Owen decomposition; logit model*

Abstract

Research background: The economic literature often states that monetary poverty does not coincide with other types of poverty. The paper examines monetary poverty and financial distress, which refer to distinct aspects of poverty. It addresses the issue by explaining how the same household characteristics affect these different types of poverty.

Purpose of the article: The paper aims to identify socioeconomic variables influencing financial distress and monetary poverty in Poland. In addition, the relative contribution of household-level variables in explaining McFadden's R2 for the financial dimensions under consideration is assessed.

Methods: The study relies on data from the EU Statistics on Income and Living Conditions (EU-SILC) survey in 2022. Logistic regression analysis empirically tests the impact of socioec-

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onomic variables on financial distress and income poverty. Moreover, the relative importance of regressors is determined using the Shapley-Owen decomposition analysis.

Findings & value added: The results have revealed that the smallest group consisted of only monetary poor households, followed by both monetary poor and financially distressed. The largest group was made up of households that experienced only financial distress. Such an incomplete overlap in experiencing the examined types of poverty implies the importance of studying financial distress alongside traditional income indicator. The study indicated a statistically significant role for characteristics such as disability, unemployment, education, the burden of the repayment of debts, household type, and tenure status in experiencing all the types of poverty considered. Furthermore, it was observed that the explanatory power of the models varied depending on the types of poverty under consideration. The results also revealed a substantial relative contribution of education to McFadden's R² in all models, indicating that education level substantially explains vulnerability to financial fragility. The contribution of other regressors varied among the models describing the types of poverty analyzed. These findings should stimulate policymakers, as effective policies are needed to alleviate different types of poverty.

Introduction

Poverty is a significant global challenge, prompting countries and international institutions to prioritize its eradication. The 2030 Agenda for Sustainable Development, adopted by the United Nations (UN) Member States in 2015, identifies ending poverty as a primary goal among the Sustainable Development Goals (SDGs) (SDGs United Nations, 2015). Poverty measurement remains crucial within the framework of the UN SDGs, which mandate participating countries to 'reduce by at least half the number of men, women, and children of all ages living in poverty in all its dimensions in accordance with national definitions by 2030' (SDGs United Nations, 2015). Achieving this target necessitates the development of effective poverty measures to assess the prevailing conditions.

In recent years, various studies have been produced to extend the analysis of monetary poverty into a multidimensional framework and to examine interactions with different aspects of deprivation (Aysenur *et al.*, 2017; Evans *et al.*, 2024; Jackson & Yu, 2023; Saunders *et al.*, 2022). The present paper also goes in that direction. It focuses on two closely related indicators of poverty: monetary poverty and the inability to face unexpected expenses. According to the first indicator, 'people are considered at risk of monetary poverty when their equivalised disposable income (after social transfers) is below the at-risk-of-poverty threshold' (Eurostat, 2021). The second indicator is the inability to face unexpected expenses in the amount of at-risk-of-poverty threshold adopted in the country. Both concepts set the

threshold at 60% of the national median equivalised disposable income after social transfers'. Despite the similarities, it should be stressed that the first indicator refers to the relative monetary poverty concept, while the second indicator reflects the absolute poverty aspect (Verbunt & Guio, 2019).

In this paper, following Mussida and Parisi (2021), we call the inability to face unexpected expenses briefly 'financial distress'. We interchangeably use both these names in the paper. Therefore, we analyze two household-level financial indicators: monetary poverty and financial distress. However, we focus on three types of poverty: 1) being only financially distressed, 2) being only monetary poor, and 3) being consistently poor, i.e., being simultaneously financially distressed and monetary poor. A simultaneous analysis of these types of poverty is underrepresented in the literature, thus our study fills a research gap.

The paper aims to identify socioeconomic variables influencing financial distress and monetary poverty in Poland. In addition, the relative contribution of household-level variables in explaining McFadden's R^2 for the financial dimensions under consideration was assessed. The study seeks to answer the following questions:

1. To what extent are the same households identified as poor by the various financial indicators?
2. Which explanatory variables significantly impact analyzed types of poverty?
3. Do the relative contributions of socioeconomic variables in explaining the model's goodness-of-fit depend on the type of poverty considered in the study?

The answers to these questions will allow to identify households most exposed to poverty in various forms. In this way, they can help policymakers 'implement nationally appropriate social protection systems and measures for all, including at the lowest levels, and achieve significant coverage of the poor and vulnerable by 2030' (see Target 1.3 of SDGs (SDGs United Nations, 2015)). A better understanding of the extent and socioeconomic correlates of various types of poverty can also shed light on the relative merits of alternative approaches to measuring poverty.

In the study, we analyze the newest 2022 cross-sectional household-level data from European Union Statistics on Income and Living Conditions (EU-SILC). While EU-SILC primarily serves as a social policy tool catering to the information requirements of policymakers and facilitating

social monitoring on a European scale, it also adeptly meets the needs of researchers by providing a comprehensive repository for empirical research on various aspects covering different types of poverty, health and well-being in the European Union (EU) (Wirth & Pforr, 2022). In our study, we focused on analyzing households in Poland. However, it is worth noting that thanks to the use of EU-SILC data, which are subject to harmonization regulated by European Union legislation, our methodology can also be applied to analyze households in other EU countries. To assess to what extent analyzed types of poverty are subject to the same determinants, we use binary logit models. Moreover, in each model, we evaluate the relative contribution of socioeconomic characteristics in explaining pseudo-R² measure by application of the Shapley-Owen decomposition method.

The novelty in this work is threefold:

- the empirical analysis focuses on the newest EU-SILC data,
- the study simultaneously investigates financial distress and monetary poverty, exploring their overlap, prevalence, and correlates at the household level,
- the study establishes the relative contribution of socioeconomic variables in explaining various types of poverty.

The remainder of the paper is organized as follows. The next section provides a literature review. The dataset and econometric strategy are presented in the ‘Research methodology’ section. The subsequent section details the empirical results, and the last section provides conclusions.

Literature review

Income-based poverty methodology has a substantial historical background and remains a fundamental aspect of poverty research (Decerf, 2023; Jung, 2022). This is attributed to the widespread acceptance of income as a key indicator of economic well-being. Most social programs aimed at alleviating poverty are assessed based on household income (Jung, 2022; Saunders & Naidoo, 2020). Therefore, monetary poverty is usually included in poverty analyses. Nevertheless, in contemporary times, there is a consensus among both scholars and practitioners that poverty is multifaceted (Alkire *et al.*, 2022; Atkinson, 2019; Ravallion, 2016; Sen, 1992). Thus, a common response is to view poverty from different perspectives or vantage points. This approach is consistent with the multi-dimensional nature

of poverty (Alkire *et al.*, 2022; Atkinson, 2019) and aligns with the 2030 Sustainable Development Goal to reduce poverty 'in all its dimensions according to national definitions' (SDGs United Nations, 2015).

A comprehensive understanding of the multifaceted aspects of poverty involves recognizing its diverse manifestations and their inherent interconnectedness (Atkinson, 2019). The literature has emphasized that monetary poverty does not always coincide with other aspects of poverty (Ayala *et al.*, 2011; Hicks, 2016; Panek, 2010; Saunders *et al.*, 2022; Szulc, 2008). In particular, in recent years, much attention in the EU has been paid to the relationship between material deprivation and monetary poverty (Aysenur *et al.*, 2017; Ayllón & Gábos, 2017; Saltkjel & Malmberg-Heimonen, 2017; Verbunt & Guio, 2019). This is primarily because in the context of the Europe 2020 Strategy, the indicator 'people at risk of poverty or social exclusion' consists of three sub-indicators: monetary poverty, severe material deprivation, and low work intensity. While the last indicator has not always been positively evaluated by researchers (Verbunt & Guio, 2019), the first two are recognized indicators used in various poverty analyses. Monetary poverty is assessed by the at-risk-of-poverty indicator referring to people whose disposable income is below 60% of the median national equivalised disposable income. The severe material deprivation indicator is based on the following nine material deprivation (MD) items: 1) being unable to face unexpected expenses, 2) lack of capacity to afford one annual week holiday away from home for all household members, 3) having arrears on the mortgage, rent payments or utility bills, 4) being unable to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day, 5) being unable to heat the household's dwelling adequately, 6) lack of washing machine due to financial reasons, 7) lack of colour TV due to financial reasons, 8) lack of telephone due to financial reasons, 9) lack of car due to financial reasons. The severe material deprivation indicator adopted in the Europe 2020 strategy set the threshold at four deprivation items. Thus, a person whose household has at least four of the nine listed symptoms is considered severely materially deprived. It should be mentioned that thirteen indicators (seven at the household and six at the individual level) relating to material and social deprivation are currently considered in the EU instead of the nine indicators describing material deprivation considered under the Europe 2020 strategy. These new indicators encompass both the material hardship experienced by individuals and households and a significant social dimension (Fabrizzi *et al.*, 2023;

Sedefoğlu & Dudek, 2024). The seven indicators measured at the household level include six of the nine considered under the Europe 2020 strategy, including being unable to face unexpected expenses.

Most of the previous work in the literature comparing monetary poverty and material deprivation (Aysenur *et al.*, 2017; Ayllón & Gábos, 2017; Verbunt & Guio, 2019; Saunders & Naidoo, 2020) indicates that these two phenomena do not fully overlap. It raises concerns that monetary poverty does not fully capture the essence of poverty. Such an incomplete overlap implies a disparity between the incomes of households above the poverty threshold and the standards of living they can attain. As Fusco *et al.* (2010) note, two individuals with identical incomes may experience vastly different living standards if their incomes do not adequately reflect all available resources, such as savings, debts, and access to subsidized public goods and services, as well as differences in their individual needs, such as healthcare, childcare, and transportation. Therefore, it is worth analyzing other types of poverty besides monetary poverty.

This study focuses on the abovementioned indicators: the at-risk-of-poverty indicator ('monetary poverty') and the inability to face unexpected expenses ('financial distress'). A direct comparison of these two indicators is inadequately addressed in the literature. We believe they are worth separate consideration for several reasons listed below.

The financial distress indicator enables, to some extent, overcoming the measurement problem of misreporting income, especially regarding the lower and upper tails of the income distribution (Dudek & Szczesny, 2021). Specifically, the survey data are burdened with the problem of the reluctance of the rich to reveal their income and assets (Kośny, 2019). As indicated by the literature, disposable income does not capture all aspects of resources available to a household (Israel, 2016). Monetary poverty is, by definition, an indicator of a temporary lack of income, while the different manifestations of multidimensional deprivation have more to do with permanent income (Ayala *et al.*, 2011). Thus, information on the ability to face unexpected financial expenses can provide important information on the financial health of households.

Research method

We analyze four categories: being ‘deprived due to financial distress only’ (FD), being ‘monetary poor only’ (MP), being ‘consistently poor’ (CP, i.e. being simultaneously financially distressed and monetary poor), and being none of these (NP – not poor, i.e., being neither financially distressed nor monetary poor).

We use a set of three binary logistic regression models:

1. FD versus NP,
2. MP versus NP,
3. CP versus NP.

Thus, our approach corresponds to a multinomial logistic model approach. However, we chose a set of binary logistic regression because we would like to assess the goodness of fit for each analyzed financial poverty dimension. Therefore, we analyze binary logistic regression models:

$$P(y = 1|\mathbf{x}) = \frac{1}{1+\exp(-\mathbf{x}'\boldsymbol{\beta})} \quad (1)$$

where:

- \mathbf{x} the vector of observed values of the regressors,
 $\boldsymbol{\beta}$ the unknown vector of parameters to be estimated.

We estimate the parameters of the models by maximizing the log-likelihood. To evaluate the goodness of fit of the binary logit models, pseudo- R^2 measures are used. The most commonly used pseudo- R^2 statistics is defined as (Hilbe, 2009):

$$pseudo - R^2 = 1 - \frac{\ln L_F}{\ln L_C} \quad (2)$$

with

- $\ln L_F$ log-likelihood for the full model,
 $\ln L_C$ log-likelihood for the intercept-only model.

The formal name of this pseudo- R^2 is McFadden’s likelihood-ratio index (McFadden, 1974). However, in most studies, it is named McFadden’s R^2 (Long & Freese, 2006; Cameron & Trivedi, 2022b). McFadden’s R^2 has an intuitive appeal in that it is bounded by zero and one. In particular, if all the slope beta parameters are zero, then it equals zero. Unfortunately,

McFadden's R^2 has no natural interpretation (Greene, 2012). It should also be noticed that in many empirical applications its value is low, i.e., values of pseudo- R^2 can be lower than 0.2 (Long & Freese, 2006).

In our study, we aim to specify the relative importance of regressors by quantifying their relative contributions to the goodness of fit. We use the approach which is analogous to the 'Shapley value decomposition' in game theory (in this theory, the Shapley value is a way to distribute the total profits of a game fairly among the players (Shapley, 1953)). This idea is useful in econometrics for analyzing regression results since the Shapley value can extract the contribution of each explanatory variable to the R^2 value of the model (Cameron & Trivedi, 2022a; Verbunt & Guio, 2019). We shortly describe the concept of application of the Shapley decomposition in regression models.

Let y be the dependent variable, x_1, x_2, \dots, x_n be the regressors, and Z be the set of all models with combinations of these regressors. The Shapley value captures the marginal contribution to the total R^2 from adding the x_j variable to the model, weighted by the number of certain permutations. The partial R^2 for the x_j variable can be calculated by

$$R_j^2 = \sum_{M \subseteq Z \setminus \{x_j\}} \frac{k! \cdot (n-k-1)!}{n!} [R^2(M \cup \{x_j\}) - R^2(M)] \quad (3)$$

where M is a model with k variables but without variable x_j , and $M \cup \{x_j\}$ is the same model but with x_j included. Young (1985) proved that the R^2 of the full model is decomposed among the independent variables (efficiency axiom): $R^2 = \sum_j R_j^2$.

In the Shapley decomposition, the average marginal contribution of each independent variable is calculated by considering not only its unique contribution, but also its contribution in connection with all possible combinations of other variables. The marginal contribution $R^2(M \cup \{x_j\}) - R^2(M)$ represents the difference in R^2 values for a submodel containing the variable x_j and an identical model without the variable x_j .

Calculating the Shapley value for a given regressor $x_j, j = 1, \dots, n$, requires building all 2^n possible models (including full model and model without any explanatory variables), which becomes a large number when the model contains multiple regressors (e.g., when $n = 23$, one needs to calculate R^2 for $2^{23} = 8,388,608$ regression models). When applied to a regression model, the Shapley decomposition generates a ranking of the re-

gressors in terms of their contributions to the increase in R^2 (Cameron & Trivedi, 2022a).

A modified version of the Shapley decomposition is the Shapley-Owen decomposition, which allows one to group subsets of regressors and to measure the group's contribution to the improvement of the R^2 value (in game theory, Owen's value is an extension of Shapley's value for cooperative games with coalitions (Owen, 1977)). Clustering the explanatory variables into groups reduces the total number of submodels to be estimated, and hence the computational effort is less than in the classical Shapley decomposition without groups.

In this study, we use a Shapley-Owen decomposition to establish the relative importance of the different variables in explaining the risk of being deprived due to financial distress only (FD), being monetary poor only (MP), and being consistently poor (CP). Statistical analyses were performed in the STATA program using the community-contributed Shapley2 command (Chavez Juarez, 2012).

Thus, our analysis encompasses three steps. Firstly, we estimate the prevalence of households being 'deprived due to financial distress only' (FD), being 'monetary poor only' (MP), being 'consistently poor' (CP, i.e. being simultaneously financially distressed and monetary poor), and being none of these (NP). Secondly, we estimate the parameters of three binary logistic regression models with baseline category NP to compare the impact of socioeconomic factors on the probability of experiencing deprivation according to the three indicators: FD, MP, and CP. Thirdly, we apply the Shapley-Owen decomposition to specify the relative contributions of regressors to McFadden's R^2 .

The data

We use the cross-sectional data from the EU Statistics on Income and Living Conditions (EU-SILC) survey conducted in 2022 to examine the differences between the risk of financial distress and monetary poverty in Poland. EU-SILC provides annual population-representative information on material deprivation and a range of demographic and socioeconomic variables on EU residents.

The analyzed sample includes 19,757 Polish households from the 2022 wave.

The study takes into account the following outcome variables:

- ‘financial distress only’ (FD) – a binary variable related to the inability of a household to face unexpected financial expenses (in the amount corresponding to the monthly value of the relative poverty line, which was €447 for Polish one-person households in 2022), (HS060 EU-SILC variable is used),
- ‘monetary poor only’ (MP) – a binary variable related to household monetary poverty understood as achieving incomes below the value of the relative poverty line, (HX080 EU-SILC variable is used),
- ‘consistently poor’ (CP) – a binary variable related to households’ experiencing both symptoms: financial distress and monetary poverty.

We consider the following set of socioeconomic factors in the models:

- highest education level of household members (the ‘education’ variable with three response categories: ‘lower than upper secondary’, ‘upper secondary’, ‘tertiary’), (PE040 EU-SILC variable is used),
- household type (single-person, two young adults (age<65), two older adults, two adults with one dependent child, two adults with two dependent children, two adults with at least three dependent children, single parent with children, other with dependent children, other without dependent children, other), (HX060 EU-SILC variable is used),
- presence of persons in households whose activities were limited due to health reasons (the ‘disability’ variable), (PH030 EU-SILC variable is used),
- presence of unemployed in the household (the ‘unemployed’ variable), (RB210 EU-SILC variable is used),
- financial burden of the repayment of debts from hire purchases or loans (the ‘financial burden’ variable with four categories: ‘repayment is a heavy burden’, ‘repayment is somewhat a burden’, ‘repayment is not a burden at all’, ‘no repayment of debts’), (HS150 EU-SILC variable is used),
- tenure status (the variable with three categories: outright owner (‘outright owner’), owner paying a mortgage (‘owner paying a mortgage’), not the owner (‘not the owner’)), (HH021 EU-SILC variable is used),
- degree of urbanization (the variable with three categories: town, city, rural), (DB100 EU-SILC variable is used),
- region of Poland (7 regions; the ‘region’ variable), (DB040 EU-SILC variable is used).

Results

The prevalence of four considered categories among Polish households in 2022 is presented in Figure 1.

It can be seen that there is a lack of correspondence between the two poverty indicators considered. As shown in Figure 1, 21% of households experienced only financial distress, 7% of households experienced only monetary poverty, and 9% – both symptoms of poverty.

To investigate what factors are behind each type of poverty, the parameters of binary logit models were estimated. The results are shown in Table 1.

An analysis of poverty correlates by means of binary logit at the household level produced similar sets of variables for all types of poverty, with some important exceptions.

Based on all three estimated models, it was found that higher levels of education were associated with a lower risk of financial deprivation and monetary poverty. It also appeared that most household types were less likely to experience any of the poverty types than single-person households (with the effect being stronger for the consistently poor). However, for a single-parent, the risk of financial distress (FD) was statistically significantly higher than for a single person. Nevertheless, it noted no statistical differences in this regard, taking into account other types of poverty. The lack of statistical difference for certain types of poverty also occurred for households of the ‘two adults with at least three dependent children’ type.

In addition, the presence of disabled and unemployed people in households was associated with a higher risk of all poverty types under consideration.

A heavy financial burden of repaying debts from hire purchases or loans most strongly increased the risk of financial deprivation and the risk of being consistently poor, but not the risk of being monetary poor only. On the other hand, if repayment was not a financial burden at all, the risk of financial distress (FD) and the risk of experiencing both symptoms of poverty (CP) were lower than in households without any repayment of debts.

Further, taking tenure status into account, it can be seen that households owing the accommodation had a lower probability of being poor than other households (i.e., tenants or subtenants). Only in the model for MP, being

the outright owner was found to be statistically insignificant for the problem studied.

A very interesting result was noted regarding the degree of urbanization of the localities inhabited by the households. No significant differences were found between town and rural areas in terms of being 'deprived due to financial distress only'. However, rural households were more likely to exhibit the other two types of poverty than urban households.

Compared to the Masovian region, residents of the rest of the country were at a higher risk of being financially distressed and consistently poor (the effect was statistically significant for the risk of financial distress in each region). Regional differences in the risk of monetary poverty did not occur (no statistical significance of the parameters).

In the final step, the Shapley-Owen decomposition approach was used to determine the relative contribution of the regressors to McFadden's R^2 .

The results presented in Table 2 show that the characteristics with the greatest explanatory power were education and household type.

Nevertheless, the results obtained here are somewhat surprising. We previously found a significant effect of characteristics such as education, and the presence of disabled and unemployed people in households on all types of poverty considered. The results in Table 2, however, indicate a different role for these variables in explaining McFadden's R^2 . Specifically, we have found that education played a noticeably larger role in McFadden's R^2 for being only financially distressed and being consistently poor, disability — for being only financially distressed, and unemployment — for only monetary and consistently poor. In addition, household type and degree of urbanization had the greatest relative contributions to McFadden's R^2 in the model for only monetary poverty. Experiencing financial burden was important for the R^2 value in the model for financially distressed. The impact of tenure status was the smallest in the model for monetary poverty, whereas the contribution of the region was at a similar level in all three models (1%-5%).

To summarize, noticeably higher contributions to explaining financial distress than monetary poverty were recorded for the variables education, disability, financial burden, tenure status, and region. In contrast, household type, unemployed, and degree of urbanization contributed more to the description of monetary poverty than financial distress.

Discussion

This paper focuses on financial distress — one of the indicators used in the measurement of material deprivation — and monetary poverty. A direct comparison of these two indicators is underrepresented in the literature by other authors, thus our study fills a research gap. Most of the previous research comparing monetary poverty and material deprivation (Aysenur *et al.*, 2017; Ayllón & Gábos, 2017; Verbunt & Guio, 2019; Saunders & Naidoo, 2020) indicate that these two phenomena do not fully overlap. It is challenging to directly compare our results with those of other authors. However, the aforementioned papers emphasize that monetary poverty and material deprivation are distinct phenomena. Our findings are in line with these results, showing relatively little overlap between the financial distress and monetary poverty.

Our results are broadly consistent with the findings presented in other papers (Aysenur *et al.*, 2017; Ayllón & Gábos, 2017; Verbunt & Guio, 2019). In particular, they confirm that low education, unemployment, and bad health were significantly related to a higher risk of all poverty types. Specifically, low education usually leads to low financial literacy (Pratiwi, 2023; Wann & Burke-Smalley, 2023), causing people to become vulnerable to financial fragility and the risk of various types of poverty.

In line with Fabrizzi *et al.* (2023) and Mussida and Parisi (2021), our study reveals that single-person households more frequently experience various forms of poverty compared to nearly all other household types. This vulnerability may stem from their reliance on the income of only one earner, making them more prone to deprivation.

Furthermore, similar to findings in other countries (Mussida & Parisi, 2021), we observed regional disparities in poverty. As a reference region, we focused on the Masovian region, home to the capital city, Warsaw, recognized as one of the wealthiest regions in Poland. As expected, we have found that households from almost all regions showed higher risks of financial distress and consistent poverty than those in the Masovian region. However, this does not apply to monetary poverty, which may be attributed to the region's significant income variation, the highest among Polish regions.

The results in terms of the effect of the degree of urbanization correspond to a large extent with the findings of Wołoszyn and Wysocki (2020), Dudek and Szczesny (2021), and Dudek and Landmesser-Rusek (2023).

Notably, examining monetary poverty according to households' places of residence, Wołoszyn and Wysocki (2020) showed that Polish rural households were monetary poorer than urban households. Furthermore, based on the results of the econometric analysis, Dudek and Szczesny (2021) found that the risk and intensity of material deprivation in Poland did not differ significantly due to the degree of urbanization. However, they indicate that omitting other household factors (e.g., the level of education) and analyzing roughly only the incidence of material deprivation in rural and urban areas can lead to different results. In addition, Dudek and Landmesser-Rusek (2023) demonstrate that the prevalence of financial distress is lower among urban households compared to rural households. However, this disparity can be explained by various household characteristics, including household composition, level of education, income, and presence of disabled or unemployed individuals.

Our results of the Shapley-Owen decomposition seem to be reasonable. In particular, we found that education plays the greatest role in explaining financial distress. This is in line with the literature (Glaeser, 2002; Hazelkorn & Mihut, 2021), which states that education can be treated as a proxy for income. Further, the burden of the repayment of debts had a very high relative importance on the risk of financial distress but had a low relative contribution in explaining goodness-of-fit in the models for monetary and consistent poverty. This result is justifiable, as the burden of the repayment of debts matters mainly on the inability to afford unexpected expenses. Similarly, although to a lesser extent, this applies to disability that generates costs affecting financial distress.

Analyzing our results, we share Mussida's and Parisi's (2021) opinion that it is worth examining financial distress separately. A significant argument for this is that the incidence of financial hardship covers, to some extent, information about the scarcity of household assets. This is very important in poverty research, as EU-SILC data does not provide direct information on the household savings and other resources.

Conclusions

The paper addresses important issues of household monetary poverty and the inability to face unexpected expenses. The results reveal that there are

novel insights to be gained from the financial distress perspective, which cannot be obtained by relying on measures of monetary poverty alone.

The paper found a low overlap between monetary poverty and financial distress and examined the reasons behind it. Specifically, of the 30 percent of financially distressed Polish households, only 9 percent were monetary poor. In 2022, the smallest group of households in Poland was a group of households being only monetary poor. The next group was those being 'consistently poor', and the largest group was a group of households who experienced only financial distress.

The study revealed a statistically significant role for household characteristics such as education, disability, unemployment, tenure status, the burden of the repayment of debts, and household type in experiencing all the types of poverty considered. Although the set of socioeconomic characteristics significantly related to the occurrence of each type of poverty is similar, large differences were found in the relative contribution of these characteristics in explaining goodness of fit for models describing poverty types. Thus, the paper is innovative in that it not only captures the effect of the socioeconomic factors in experiencing different types of poverty but also estimates their relative importance compared with all other factors. To do so, a Shapley-Owen R^2 decomposition analysis is conducted after the logistic regression analysis. This analysis enables a better understanding of the phenomena under consideration and thus can help in policies aimed at combating different types of poverty.

In this paper, we present the results for Poland. However, since we utilize EU-SILC data, which undergoes harmonization regulated by European Union legislation, our methodology can be applied to the analysis of other EU countries. While EU-SILC primarily serves as a social policy instrument addressing policymakers' information needs and is commonly used for social monitoring at the European level, it's important to note that despite its numerous advantages, EU-SILC does not include information on household savings, which constitutes a certain limitation in our study.

In conclusion, it is essential to analyze not only monetary poverty but also financial distress, as they provide different information about households' circumstances and contribute to a more nuanced understanding of poverty. Thus, both indicators can be viewed as two different faces on the same coin, representing multidimensional financial poverty.

A significant proportion of households classified as non-monetary poor experience difficulty coping with unexpected expenses, underscoring the

importance of considering financial resilience alongside traditional income indicator. Therefore, policy should not only be aimed at reducing monetary poverty but also at reducing financial distress. Future research should explore the impact of social programs on reducing various forms of poverty, particularly considering financial instability.

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Annex

Table 1. The binary logistic regression model results

Variable	FD		MP		CP	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	St. Err.
education: tertiary – ref.						
lower than upper secondary	1.619	0.121	1.516	0.193	2.935	0.175
upper secondary	1.042	0.069	0.920	0.112	1.800	0.129
household type: single-person household – ref.						
2 young adults	-0.647	0.093	-1.451	0.143	-1.698	0.129
2 old adults	-0.447	0.073	-1.837	0.151	-1.705	0.119
2 adults with 1 child	-0.685	0.119	-0.819	0.263	-1.532	0.224
2 adults with 2 children	-0.580	0.111	-0.402	0.161	-1.487	0.201
2 adults with 3 + children	-0.266	0.179	-0.039	0.233	-0.617	0.280
single-parent	0.660	0.207	-0.217	0.332	-0.053	0.234
other with children	-0.702	0.118	-1.180	0.161	-2.550	0.197
other without children	-0.673	0.097	-1.390	0.178	-2.270	0.178
other	-0.380	0.166	-0.753	0.250	-1.370	0.335
disability	0.494	0.061	0.268	0.104	0.726	0.091
unemployed	0.372	0.155	1.539	0.188	2.216	0.163
financial burden: no repayment of debts – ref.						
repayment is heavy burden	1.461	0.114	0.074	0.252	0.808	0.184
repayment is somewhat a burden	0.157	0.098	-0.597	0.196	-0.559	0.183
repayment is not a burden at all	-0.396	0.138	0.012	0.201	-0.752	0.301
tenure status: not the owner – ref.						
outright owner	-0.712	0.079	0.207	0.149	-0.834	0.098
owner paying a mortgage	-0.935	0.133	-0.315	0.243	-1.527	0.276
degree of urbanization: rural – ref.						
town	0.003	0.075	-0.668	0.121	-0.484	0.103
city	-0.245	0.076	-1.183	0.120	-0.976	0.110
region of Poland: Masovian – ref.						
South	0.456	0.108	0.087	0.175	0.161	0.161
Northwest	0.603	0.111	-0.081	0.187	0.496	0.160
Southwest	0.408	0.126	-0.289	0.223	0.143	0.180
North	0.661	0.108	0.263	0.183	0.642	0.165
Central	0.535	0.121	0.028	0.198	0.427	0.174
Eastern	0.355	0.109	0.233	0.176	0.582	0.162
constant	-1.386	0.150	-1.788	0.247	-1.789	0.218
Mcfadden's R ²	0.1268		0.1465		0.3360	

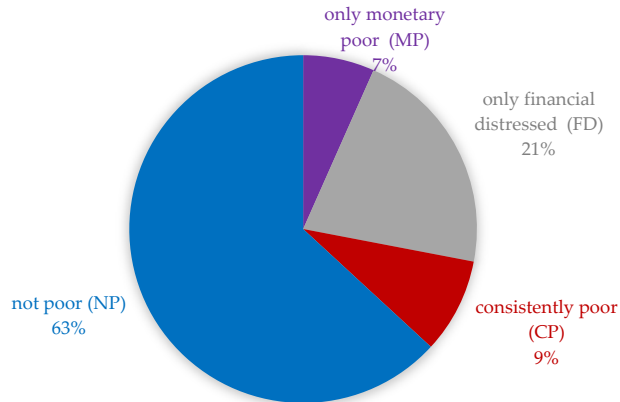
Source: own calculations based on EU-SILC 2020 data. Note: Coef. are estimates of the parameters, Std. Err. – their standard errors. The bold values denote statistical significance at a level of 0.05. All standard errors are heteroscedasticity-robust standard errors.

Table 2. Results of Shapley-Owen decomposition

Variable group	FD	MP	CP
Group 1: education	37.59 %	26.25 %	35.32 %
Group 2: household type	12.82 %	34.52 %	28.61 %
Group 3: disability	10.03 %	1.15 %	5.46 %
Group 4: unemployed	0.62 %	12.29 %	10.89 %
Group 5: financial burden	16.96 %	3.03 %	5.18 %
Group 6: tenure status	9.83 %	3.35 %	9.03 %
Group 7: degree of urbanization	1.59 %	17.03 %	4.43 %
Group 8: region	4.77 %	2.64 %	1.85 %
All groups	100%	100%	100%

Source: own calculations based on EU-SILC 2020 data.

Figure 1. Prevalence of various poverty types in 2022



Source: own calculations based on EU-SILC 2022 data.