
Why Households Borrow Money? Socio-Economic Factors Affecting Households Debts: A Model Approach

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Agnieszka Strzelecka¹, Danuta Zawadzka²,

Abstract:

Purpose: This research aims to identify and assess the socio-economic determinants of Central Pomerania household indebtedness (at the household level) using non-parametric tests and multiple correspondence analysis.

Design/Methodology/Approach: The source of data was a survey conducted among 1,000 households of Central Pomerania (Poland). First, it was determined whether there exists a statistically significant relationship between having debt and the socio-economic characteristics of the households analyzed (using the chi-square test or the Fisher test). Next, a multiple correspondence analysis was used to identify and assess relationships between the categories of features that characterize the surveyed households' indebtedness.

Findings: Using non-parametric statistical tests, it was established that there is a statistically significant relationship between debt and the following household characteristics: development phase, size and composition of the household, socio-economic type, location of the household, a form of residential unit ownership, age of the household head, having economic education by the head of the household, and the level of average monthly income per person in the household. The most often indebted households were those whose main source of income was self-employment, with the number of members exceeding 3 persons and households with dependent children.

Practical Implications: The results obtained in this research may be sources of information for credit institutions interested in adjusting the product offer to households' needs because these households - as our research results show - differ in several socio-economic characteristics.

Originality/Value: Our study complements the results of previous research on household debt determinants, confirming the important role of socio-economic factors in the process of making financial decisions regarding debt.

Keywords: Household debt, multiple correspondence analysis, socio-economic factors, non-parametric statistical tests, Central Pomerania, Poland.

JEL: D1, D12, D14.

Paper type: Research article.

¹ Dr., Koszalin University of Technology, Faculty of Economic Sciences, Department of Finance, Koszalin, Poland, e-mail: agnieszka.strzelecka@tu.koszalin.pl;

² Prof., Koszalin University of Technology, Faculty of Economic Sciences, Department of Finance, Koszalin, Poland, e-mail: danuta.zawadzka@tu.koszalin.pl;

1. Introduction

The use of external financing sources is one of the research aspects in household financial decisions. In recent years, there has been an increased interest in this issue, especially in the face of the noted effects of the global financial crisis for households (Košťálová, 2019; Elvery, 2020; Hake and Poyntner, 2020). One of the research problems in this area is determining households' propensity to incur debt. Research results presented in the literature show that several macroeconomic and microeconomic factors may influence household decisions. In the former dimension, the following factors are distinguished: the level of interest rates, access to loans and financial services, real estate prices (especially for entities that incur liabilities for this purpose), financial innovations in the field of credit services (Jacobsen and Naug, 2004; Dynan and Kohn, 2007; Košťálová, 2019; Turinetti and Zhuang, 2011).

On the other hand, microeconomic factors relate in particular to household characteristics, such as household income, development phase, the size and composition of the household, its location, and its socio-economic type (Chien and DeVaney, 2001; Lee, Lown and Sharpe, 2007; Turinetti 2011; Costa and Farinha, 2012; Wałęga, 2012; Altundere, 2014; Breuer, Hens, Salzmann and Wang, 2015; Khan, Abdullah, and Samsudin, 2016; Kim, Wilmarth and Henager, 2017; Zakaria, Jaafar and Ishak, 2017; Haq, Ismail, and Mohd Satar, 2018; Košťálová, 2019; Ebrahimi, 2020; Hake and Poyntner, 2020; Intarapak, and Supapakorn, 2020). This study fits squarely into this research. In our work, we focus on socio-economic factors and study the determinants of household indebtedness at the household level, using for this purpose data on Central Pomeranian households obtained from a study survey conducted in 2019 (using a survey questionnaire).

This research aims to identify and assess the socio-economic determinants of Central Pomerania household indebtedness (at the household level) using non-parametric statistical tests and multiple correspondence analysis.

The rest of the paper is organized as follows. Section 2 provides a literature review, which is the basis for empirical research. Section 3 presents the survey methodology and data sources. Section 4 presents a short description of the surveyed households. Section 5 presents the study results, which consisted of three main phases: (1) It was determined whether there is a statistically significant relationship between having debt and the households' socio-economic characteristics analyzed (using the chi-square test or the Fisher test). (2) Multiple correspondence analysis was used to identify and assess relationships between the categories of features that characterize the surveyed households' indebtedness. (3) The surveyed households' characteristics were identified and assessed depending on the form and purpose of debt, using the Mann-Whitney U test, Kruskal-Wallis test, Dunn's post-hoc test with Holm adjustment, and the Spearman's rank correlation coefficient. The last section concludes.

2. Literature Review

The main purpose of households is to meet the needs of its members. This applies, among others, to the consumption of goods and services, the amount of which depends on the current income and owned assets. It is also a limitation in meeting household needs. A credit market enables households to increase their purchasing power and consume at a higher level than their current income and assets. Credit (loan) is an important source of financing expenses in periods of shortages (Huszczonek and RYTELEWSKA, 2004), and it also facilitates optimization of consumption - in the event of a discrepancy between the dates of incurring expenses and the date of obtaining income. However, too high financing of needs with credit may lead to the phenomenon of over-indebtedness, known as a "debt spiral" (Mashigo, 2006; Wałęga, 2006; Wiśniewska, 2016). It is a consequence of high availability of credit/loan (Bolibok, 2017a), a special situation on the market of specific goods (e.g., real estate market), it may also result from events that harm household income. It occurs when the household cannot repay the debt in the long term, and the current income is not sufficient to finance the costs of debt and repayment of capital installments (Kuchciak, 2013). Some authors see the causes of this phenomenon in the difficulties in accessing banking products (Andre, 2016), and, consequently, using more expensive financial products offered by non-banking institutions (Kuchciak, 2013).

Based on the model of the life cycle of Ando and Modigliani (1963) and the theory of permanent income by Friedman (1957) and Meghir (2004), it can be assumed that the degree of debt depends on the expected household income in the future. A household may spend more than its current income (real estate purchases, education expenses). In line with the life cycle hypothesis, in the initial period, households do not have any savings, and their disposable income is lower than the level of income that they expect to achieve over the course of a lifetime (permanent income). At this stage, households decide to use external financing sources; for example, they use a mortgage to buy a house.

Through credits/loans, financing of expenses that exceed income can be done without restricting consumption. Having a high debt is often seen as a sign of a household's financial growth (Harari, 2017). With the end of working life and household members' retirement, the level of income decreases, and consequently, household expenses exceed current income. In making financial decisions, households consider future and present values of actual income. According to the hypothesis of M. Friedman, households decide to finance consumption with credit to eliminate the deviations of current and permanent income. Thanks to this, they can even out the consumption level over time (Wałęga, 2010).

The literature strongly emphasizes the relationship between social inequality and household indebtedness (Christen and Morgan, 2005; Iacoviello, 2008, Zakaria, Jaafar and Ishak, 2017; Bolibok, 2017a; Jestl, 2019; Hake and Poyntner, 2020). The

explanation is provided by Duesenberry's Relative Income Hypothesis (Duesenberry, 1949). It refers to the phenomenon of imitation of consumption patterns.

According to this hypothesis, the level of consumption depends not only on the current income but also on the relation of a given individual's income to their environment's income level. The research results showed that individuals tend to compete with the level of consumption of family, neighbors, or friends. So if a person's income remains lower than that of other people in their environment, they will be willing to spend more of it on consumption and less on savings to match the level of consumption of other people in their environment. Thus, the propensity for indebtedness will be higher when this person's income is lower than the level of income of other entities in their immediate environment (reference group).

Poorer households, striving for a higher level of consumption, support themselves with credit financing - through excessive indebtedness. Research in this area was carried out, among others, by Georgarakos, Haliassos, and Pasini (2014), arguing that among those who consider themselves poorer than their peers, the perceived level of income of the reference group contributed to debt and the likelihood of financial problems. An important issue in considering households' propensity for indebtedness is also the hypothesis formulated by Duesenberry on the irreversibility of consumption (Bywalec, 2009). It deals with the relationship between changes in income and household consumption expenditure. Namely, these entities have a certain fixed level of expenses that are incurred in meeting consumption needs.

According to the hypothesis of the irreversibility of consumption, in a situation where household income declines, it will not be willing to reduce the consumption expenditure determined in the previous period, which will then be financed, for example, from previously accumulated savings, or by using external sources of financing, such as credits and loans.

From the macroeconomic point of view, household loans influence market demand creation and are, therefore, the economic category responsible for economic growth (Wałęga, 2013). On the other hand, the level of household debt affects the level and structure of their spending. In a situation where a significant part of household income is spent on debt repayment, they will limit spending on consumer goods and services (Fan and Yavas, 2020). The business cycle phase affects the availability of credit and, consequently, the dynamics of indebtedness. In the period of economic growth, in the conditions of growing household income and greater availability of credit, the level of consumption increases, based on credit financing. In the conditions of recession, drop in wages, and spending cuts, the opposite occurs (Wałęga, 2013; Utzig, 2015; Bolibok, 2017b).

The level of income affects the household's creditworthiness and the possibility of obtaining a loan in the formal market. In a situation where the level of income is lower than the level of expenditure in each period, the household looks for alternative

financing options. In this situation, it can use the previously accumulated savings (if it has them) or take out a credit/loan. Households that do not have savings and, at the same time, do not have creditworthiness will look for sources of financing on the informal market, e.g., using the services of nearby banks, which is associated with a higher cost of debt servicing. This situation may lead to the phenomenon of over-indebtedness as described above.

The size and composition of a household and its development phase determine the level and structure of its expenditure, and thus, as the research results prove, they are a factor determining household debt (Chien and DeVaney, 2001; Lee, Lown and Sharpe 2007; Costa and Farinha, 2012; Haq, Ismail, and Mohd Satar, 2018; Jestl, 2019; Strzelecka, Kurdyś-Kujawska and Zawadzka 2020a; Hake and Poyntner, 2020; Intarapak and Supapakorn, 2020).

The literature also emphasizes the importance of education level, including the level of financial literacy, and its relation to households' financial decisions, including decisions concerning incurring liabilities. The relationship between the propensity for indebtedness and education can be considered about the income level. A higher level of education is related to the possibility of obtaining a higher level of income, and the higher it is, the higher the creditworthiness of the household. People with higher education levels have the prospect of a steeper path of income growth over the course of their lives (Dyan and Kohn, 2007).

Also, educated people more consciously use the opportunities offered to them by the financial market. These people understand the mechanisms of the modern economy to a greater extent, including the credit market's role, and they want to use it (Wałęga, 2012). Research results on the relationship between the level of education and household debt mostly confirm the positive relationship between these variables (Chien and DeVaney, 2001; Lee, Lown and Sharpe 2007; Tan, Yen, Loke, 2011; Wałęga, 2012; Haq, Ismail and Satar, 2018; Strzelecka, Kurdyś-Kujawska and Zawadzka 2020a; Hake and Poyntner, 2020).

Concerning the Life-Cycle Hypothesis, the head of household's age is also considered in studies on the factors influencing household debt. The conducted literature studies have shown that research results on the influence of age on having debt are not unequivocal. On the one hand, they indicate a negative relationship between debt and the age of the head of household (Chien and DeVaney, 2001; Yilmazer and DeVaney, 2005; Turinetti and Zhuang, 2011; Costa and Farinha, 2012). However, some works prove a positive relationship between age and the propensity for debt (Haq, Ismail, and Mohd Satar, 2018; Larsson, Hallsten, and Kilström, 2018). As Ebrahimi (2020) proves, one of the reasons for the increase in the probability of indebtedness of older adults is the willingness to provide financial support to children and grandchildren. Due to the observed differences in research results, it is important to continue research into the relationship between age and decisions regarding debt to finance household needs.

Research results on debt also show a variation in this respect depending on the household's location (Walks, 2013; Jestl, 2019). The household (country, region, large city, small town, village) affects both the level of income and household needs and thus determines the level and structure of its expenses. Moreover, the availability of financial services and products for households is related to their location (Magri, 2002).

The theoretical considerations and empirical studies carried out have not contributed to an unequivocal determination of the dependence of household debt on individual factors. It became the reason for undertaking this research, the results of which are presented in this paper.

3. Material and Methods

The main source of empirical data was a survey conducted among 1,000 households in Central Pomerania in Poland. The survey was conducted in the second quarter of 2019 using the direct questionnaire technique. In the research course, the number of correctly completed questionnaires was 746 (return rate at the level of 74.6%). Respondents were asked to provide information for 2018. In the selected questions, the time scope of the study covered the years 2004-2018.

Due to the type of data, non-parametric statistical tests were used (Gaddis and Gaddis, 1990; Nahm, 2016). The analysis of indebted households' features about those that do not have debt was performed using the chi-square test or the Fisher test. On the other hand, for the identification of household characteristics, depending on the form of debt and for the assessment of the importance of debt reasons, the Mann-Whitney U test (to compare two groups concerning subsequent variables) or the Kruskal-Wallis test (for 3 and more groups) was used; and in case of obtaining statistical significance, it was supplemented with Dunn's post-hoc test with Holm adjustment as part of intergroup comparisons. Spearman's rank correlation coefficient was used for numerical variables.

Next, the multiple correspondence analysis was used to identify the factors influencing the propensity for the indebtedness of the surveyed households in Central Pomerania. This method enables the analysis of qualitative variables, and its advantage is the ability to analyze relationships not only of quantitative data but also of nominal and ordinal data. Therefore, it is a useful method when analyzing data obtained using a questionnaire, where most of the questions are qualitative, and the answers are limited to specific categories (Kamalja and Khangar, 2017). In this method, there are also no requirements regarding the distribution to which the analyzed variables should be subject (Górniak, 2000). It enables the graphical presentation of relations between the studied categories through their projection in a space with a reduced number of dimensions (Massari, Manca, and Girone, 2016).

The application of multiple correspondence analysis covered 5 main stages (Zawadzka and Kurdyś-Kujawska, 2015; Strzelecka, Kurdyś-Kujawska and Zawadzka 2020a). First, the Burt table was determined, then the actual dimension of the space of coexistence of variable categories was determined. Subsequently, the standardized difference matrix was decomposed according to singular values to determine the extent to which the eigenvalues of lower dimension spaces explained the total inertia (variance). The optimal dimension of projecting the space of variable categories was made based on the Greenacre criterion (Machowska-Szewczyk and Sompolska-Rzechuła (2010):

$$\lambda_k > \frac{1}{Q} \quad (1)$$

where: λ_k – k^{th} eigen value; Q – number of variables
then the modified singular and eigenvalues were calculated using the formula:

$$\widetilde{\lambda}_k = \left(\frac{Q}{Q-1}\right)^2 \left(\sqrt{\lambda_k} - \frac{1}{Q}\right)^2 \quad (2)$$

The results of the correspondence analysis are presented graphically using a perception map. To determine the factors related to having debt, the following set of socio-economic characteristics and the corresponding categories were adopted based on the literature review and data included in the questionnaire (Table 1):

Table 1. Set of potential variables adopted for the study

Variable	Description of the variable and its categories
DEB	household debt: yes; no
DPH	household development phase: single young person's household; young marriage/partnership without a child; single person with a dependent children; marriage/partnership with dependent children; marriage/partnership in middle or old age without dependent children; single household older person; other
LHM	number of household members: less than 3 people (<3 people); 3 or more people (3+ people)
SHME	share of household members engaged in gainful employment in the total number of members of the household: <0.5; 0.5-0.99; 1
SCH	share of children in the total number of people in the household: 0; <0.5; ≥0.5
TSE	socioeconomic type of household (main source of income): employees; farmers; self-employed; pensioners; other
LOC	household location: village; city
FO	form of ownership of a residential unit: privately owned apartment; own house; flat rented from a private person; council flat; other
AGE	age of the head of the households: under 45 years old; above 45 years old

EDU	education of the head of a household: basic; basic vocational; secondary; post-secondary; higher
EC	economic education of the head of the household: yes; no
INC	average monthly net income per person in a household: up to PLN 1,000; PLN 1,001-1,500; PLN 1,501-2,000; above PLN 2,000
SAV	funds collected in the form of savings in the household: yes; no
HARD	difficulties in accessing financial services or products: yes; no

Source: Own creation.

4. Characteristics of the Surveyed Households

The dominant group of households was entities in rural areas (46.2%), households from cities with more than 50,000 inhabitants (27.2%), and smaller towns (up to 50 thousand inhabitants - 26.5%). Based on the household's development phase, it was found that the most numerous groups were marriages/partnerships with dependent children (47.1%). Three-person households constituted half of the population. Most of the entities included in the analysis were those where the household head was a man (62.2%). The average age of a household head was 45. Almost 65% of the population were units where the head of the household had secondary education. 27.9% of respondents declared having higher education.

For most respondents (61.1%), the basic income source was the salary obtained from paid employment. Subsequently, the respondents indicated: income from non-agricultural business activity (14.5%), old-age and disability pensions (13.5%), and income from agricultural activity (9.5%). In the surveyed group, 17.6% of entities had an average monthly net income per capita in a household not exceeding 1,000 PLN. In the case of over 1/3 of the respondents (36.6%), the analyzed income category was higher than 2,000 PLN per person. 50.9% of the analyzed households were characterized by a steady increase in income in 2004-2018, while 61.4% of entities were characterized by a constant increase in expenditure in this period. More than half of the group (50.9%) diversified their sources of income.

Among the surveyed group of households in Central Pomerania, 34.3% were in debt. On average, these entities allocated 17.6% of their income to repay liabilities, while for half of the population, the debt ratio did not exceed 15% of the total income, and its maximum level was 60%.

5. Empirical Results

Identification of socio-economic features influencing household debt was started with determining whether there is a statistically significant relationship between having debt and the surveyed households' socio-economic characteristics adopted for the analysis, using the non-parametric chi-square test or the Fisher exact test. The results of these calculations are presented in Table 2.

Table 2. Comparison of the surveyed households in relation to debt for the variables included in the analysis

	Variable	Sub-sample		Statistical test	p-value
		DEB Yes (N=256)	DEB No (N=497)		
		Share of households in particular categories:			
DPH	single young person's household (N=89)	23.6%	76.4%	χ^2	0.0002
	young marriage/partnership without a child (N=81)	35.8%	64.2%		
	single person with a dependent children (N=25)	32.0%	68.0%		
	marriage/partnership with dependent children (N=354)	41.0%	59.0%		
	marriage/partnership in middle or old age without dependent children (N=101)	27.7%	72.3%		
	single household older person (N=41)	7.3%	92.7%		
	other (N=62)	35.5%	64.5%		
LHM	less than 3 people (N=346)	28.3%	71.7%	χ^2	0.0031
	3 or more people (N=407)	38.8%	61.2%		
SHME	<0,5 (N=192)	24.0%	76.0%	χ^2	0.0012
	0,5-0,99 (N=322)	39.8%	60.2%		
	1 (N=239)	34.3%	65.7%		
SCH	<0,5 (N=190)	41.1%	58.9%	χ^2	0.0028
	>=0,5 (N=195)	39.0%	61.0%		
	0 (N=362)	28.2%	71.8%		
TSE	employees (N=460)	33.9%	66.1%	Fisher	<0.0001
	farmers (N=71)	45.1%	54.9%		
	self-employed (N=108)	50.0%	50.0%		
	pensioners (N=104)	12.5%	87.5%		
	other (N=10)	10.0%	90.0%		
LOC	village (N=345)	38.0%	62.0%	χ^2	0.0438
	city (N=407)	30.7%	69.3%		
FO	privately owned apartment (N=268)	34.3%	65.7%	Fisher	0.0108
	own house (N=331)	39.0%	61.0%		
	flat rented from a private person (N=86)	18.6%	81.4%		
	council flat (N=35)	31.4%	68.6%		
	company flat (N=6)	16.7%	83.3%		
	other (N=26)	26.9%	73.1%		
AGE	under 45 years (N=357)	40.3%	59.7%	χ^2	<0.001
	above 45 years (N=396)	28.3%	71.7%		
EDU	basic (N=54)	22.2%	77.8%	χ^2	0.0642
	basic vocational (N=203)	32.5%	67.5%		
	secondary (N=230)	31.3%	68.7%		
	post-secondary (N=56)	35.7%	64.3%		
	higher (N=210)	41.0%	59.0%		

EC	yes (<i>N</i> =134)	46.3%	53.7%	χ^2	0.0013
	no (<i>N</i> =619)	31.3%	68.7%		
INC	up to PLN 1,000 (<i>N</i> =132)	27.3%	72.7%	χ^2	0.0015
	PLN 1,001-1,500 (<i>N</i> =199)	26.1%	73.9%		
	PLN 1,501-2,000 (<i>N</i> =149)	36.9%	63.1%		
	above PLN 2,000 (<i>N</i> =273)	41.4%	58.6%		
SAV	yes (<i>N</i> =451)	35.0%	65.0%	χ^2	0.5126
	no (<i>N</i> =302)	32.5%	67.5%		
HARD	yes (<i>N</i> =105)	42.9%	57.1%	χ^2	0.0506
	no (<i>N</i> =648)	32.6%	67.4%		

Source: Own creation.

The applied non-parametric tests showed that a statistically significant relationship with having debt was noted for the following household characteristics: development phase, several members, the share of household members engaged in gainful employment, the share of children, socio-economic type, location, a form of residential ownership, age of the household head, having an economic education by the household head and the level of the average monthly income per person in the household. In the next stage of the research, a multiple correspondence analysis was used to identify and assess the relationships between the categories of characteristics of households with debt in the region of Central Pomerania.

By examining the relationships between the categories of the dependent variable (DEB) and the categories of associated factors relating to households' socio-economic features, the Burt table with 46x46 dimensions was first created. For the studied variables, the actual space of coexistence of the feature categories was 32. Then, the lower dimension of the common space for row and column profiles was searched so that as much of the total inertia as possible was explained. To determine to what extent the total inertia (variance) was explained by the eigenvalues of lower dimension spaces, a matrix of differences standardized according to singular values was distributed. The results obtained for the eigenvalues λ_k of the standardized difference matrix (squares of singular values γ_k), the percentage of inertia λ_k / λ and the share of the eigenvalues of the K dimension in the total inertia (cumulative percentage) are presented in Table 2.

Table 3. *Singular and eigenvalues and the degree of explanation for total inertia*

Number of dimensions K	Singular values	Eigen values	Percentage of inertia	Accumulated percentage
1	0.5402	0.29185	12.8	12.8
2	0.4653	0.21654	9.5	22.2
3	0.3649	0.13313	5.8	28.1
4	0.3458	0.11957	5.2	33.3
5	0.3145	0.09888	4.3	37.6
6	0.3096	0.09583	4.2	41.8
7	0.2956	0.08740	3.8	45.6
8	0.2869	0.08233	3.6	49.2
9	0.2831	0.08014	3.5	52.7

10	0.2787	0.07770	3.4	56.1
11	0.2738	0.07498	3.3	59.4
12	0.2670	0.07131	3.1	62.5
13	0.2649	0.07015	3.1	65.6
14	0.2594	0.06728	2.9	68.6
15	0.2576	0.06635	2.9	71.5
16	0.2502	0.06262	2.7	74.2
17	0.2483	0.06166	2.7	76.9
18	0.2379	0.05662	2.5	79.4
19	0.2345	0.05499	2.4	81.8
20	0.2309	0.05331	2.3	84.1
21	0.2294	0.05262	2.3	86.4
22	0.2231	0.04976	2.2	88.6
23	0.2103	0.04422	1.9	90.5
24	0.2010	0.04040	1.8	92.3
25	0.1919	0.03683	1.6	93.9
26	0.1862	0.03466	1.5	95.4
27	0.1793	0.03214	1.4	96.8
28	0.1666	0.02776	1.2	98.0
29	0.1353	0.01829	0.8	98.8
30	0.1145	0.01312	0.6	99.4
31	0.0844	0.00713	0.3	99.7
32	0.0785	0.00616	0.3	100.0
		$\lambda =$		
		2.28573		

Source: Own creation.

Applying the Greenacre's criterion, according to which the optimal projection dimension of the variable category space is selected based on the condition: $\lambda_k > 1/Q$, it was established that in the analyzed case (Table 3), the value $1/Q = 1/14 = 0.07143$ points to the R11 space. Then, the singular and eigenvalues modified by Greenacre's proposal were calculated (Table 4).

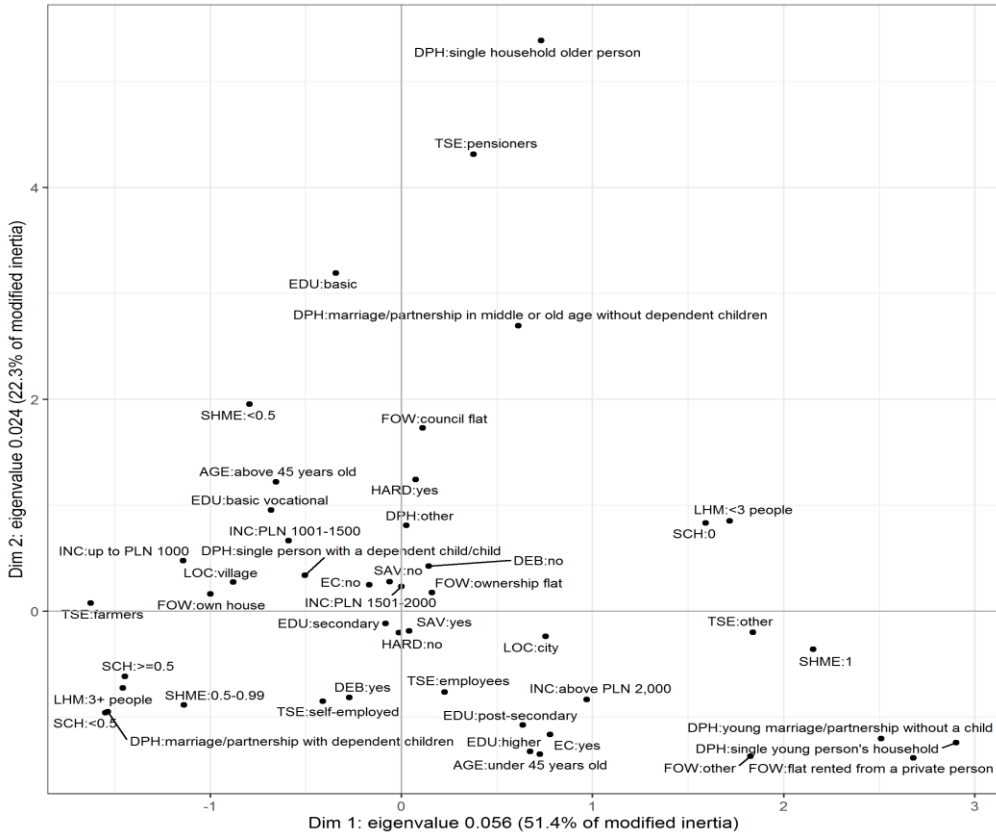
Table 4. Modified singular and eigenvalues and degree of explanation for total inertia

Number of dimensions K	Singular values	Eigen values	Percentage of inertia	Accumulated percentage
1	0.23737	0.05634	51.4	51.4
2	0.15628	0.02442	22.3	73.7
3	0.06645	0.00441	4.0	77.7
4	0.05184	0.00269	2.5	80.2
5	0.02956	0.00087	0.8	81.0
6	0.02628	0.00069	0.6	81.6
7	0.01720	0.00030	0.3	81.9
8	0.01174	0.00014	0.1	82.0
9	0.00938	0.00009	0.1	82.1
10	0.00675	0.00005	0.0	82.1
11	0.00383	0.00002	0.0	82.1

Source: Own creation.

Based on the modified eigenvalues and the share in the total inertia of individual dimensions (Table 4), a two-dimensional space was selected for the graphical presentation of the coexistence of feature categories, which represents approximately 73.7% of the total inertia (Figure 1).

Figure 1. Presentation of the results of relationships of feature categories in R^2



Source: Own creation.

The obtained results proved that both the socio-economic type and the development phase and the size and composition of the household influence the fact that the surveyed households incur liabilities. The most often indebted households were those whose main income source was self-employment, with the number of members exceeding 3 persons and households with dependent children (share of children > 0, marriage/partnership with dependent children).

On the other hand, the least frequently indebted were the elderly (development phase: a single household of an older adult and a middle-aged or elderly marriage/partnership without dependent children), whose main income was retirement and disability pensions, without children. It was also found that the lack of debt was related to the primary education of the head of household.

Then, the surveyed households' characteristics were identified and assessed, depending on the form and purpose of indebtedness. Table 5 presents the debt structure and the percentage of the surveyed households that used particular forms of debt.

Table 5. Debt structure and percentage of surveyed households using particular forms of debt

Description	Debt structure [%]	Percentage of households using a given form of debt [%]*
mortgage	40.71	46.09
shopping in installments	20.54	16.41
investment loan	8.52	9.38
consumer loan/ bank loan/ cash loan	8.25	21.48
credit cards	7.68	41.41
loan from institutions other than banks	5.10	9.77
overdraft limit	4.33	12.11
loans from friends/family	3.02	2.73
other	1.85	10.94
Total debt	100.00	---

Note: *Due to the fact that the respondents could choose more than one form, the percentage of households using a given form of debt does not add up to 100%.

Source: Own creation.

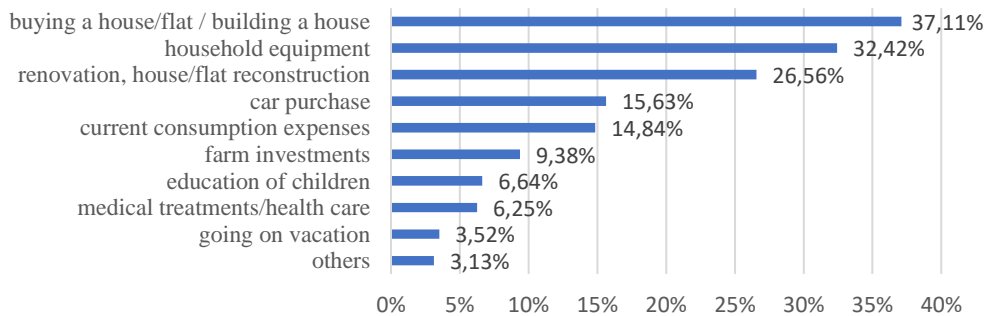
Mortgage loans dominated the surveyed entities' debt structure, accounting for an average of 40.71% of the liabilities under consideration (Table 1). Almost half of the surveyed households (46.09%) had such debt. Further analyses showed a statistically significant correlation between the mortgage debt rate and the financial situation of the household and the household head's education. Using the Mann-Whitney U test, it was found that the mortgage debt ratio was on average higher for households that accumulated savings ($p=0.0395$), were characterized by a constant increase in income ($p=0.0001$), and had no difficulties in access to financial products or services ($p=0.002$).

Moreover, the debt ratio on this account was on average higher for households with the highest income level, compared to households in the lowest of the adopted income classes (Kruskal-Wallis test, $p=0.0016$; Dunn's post-hoc test $p=0.0012$) and in households where the reference person had higher education compared to people with basic vocational education (Kruskal-Wallis test, $p=0.0008$; Dunn's post-hoc test $p=0.0001$). Installment purchases (20.54%) also played a significant role in the surveyed entities' debt structure, with every sixth household indebted in this manner.

Credit cards were used by more than 41% of the surveyed entities, and the liabilities on this account constituted, on average, 7.68% of their total debt. Nearly 10% of the surveyed entities used a non-bank loan, with a higher debt ratio on this account

characterized by entities with difficulties accessing financial services and products, compared to households that did not encounter such difficulties (U Mann's test, Whitney, $p=0.0301$). A higher average share of debt also characterized these households due to informal loans (from family/friends) (Mann-Whitney U test, $p=0.0448$). Moreover, the obtained results indicate that every fifth surveyed household used a consumer loan, a bank loan, or a cash loan, which constituted, on average, 8.25% of the debt of the surveyed entities.

Figure 2. Debt purpose of the surveyed households



Source: Own creation.

The surveyed households incurred debt mainly to buy a flat/house or build a house. Over 37% of the surveyed entities indicated this purpose as important or essential. Further analyses using the Kruskal-Wallis test showed that the significance of this goal varied depending on the location of the household ($p=0.009$), the level of income ($p=0.0004$), and the education of the household head ($p=0.0003$). Dunn's post-hoc analysis showed that the importance of debt purpose for buying a house / flat or building a house was higher in households located in a city with more than 50,000 inhabitants than in the countryside ($p=0.00645$).

A similar relationship was observed in the case of households with a per capita income level exceeding 2,000 PLN, compared to units whose average monthly income per person did not exceed 1,000 PLN ($p=0.00044$). It was also established that statistically significant differences in assessing the importance of the analyzed purpose exist for households where the reference person had a higher education than people with basic vocational education ($p=0.00029$) and people with secondary education ($p=0.00405$). For people with higher education, this purpose was more important than for the other groups mentioned. The results of the Mann-Whitney U test also proved that in the case of households which had been characterized by a constant increase in income since 2004, the debt due to the purchase of a house/flat was more important than in the case of entities with no such trend in income ($p < 0.0001$).

The second most important purpose of incurring liabilities for the surveyed group was purchases related to household equipment. Almost every third household surveyed indicated this goal as important or important. Using the Kruskal-Wallis test, also found that the significance of this goal differed depending on the socio-economic group of the household ($p=0.0072$). Dunn's post-hoc test results show that the assessment of the importance of the purpose of household equipment expenditure was higher in the case of entities whose main source of income is self-employment, according to workers ($p=0.0114$).

An important purpose of incurring liabilities by the examined entities was the financing of expenses related to the residential unit's renovation. Every fourth respondent (26.56%) indicated this goal as important or very important. Further analyzes with statistical tests (U Mann-Whitney, Kruskal-Wallis, posthoc Dunn) did not show statistically significant differences (at the level of significance of 5%) in assessing this purpose in individual groups of households.

Car debt was an important purpose for 15.63% of the surveyed entities. This purpose was more important in the case of households in which the reference person was a man (Mann-Whitney U test, $p=0.0097$), located in the countryside and the city with up to 50 thousand inhabitants - compared to households from cities with more than 50 thousand inhabitants (Kruskal-Wallis test, $p=0.0076$, Dunn's post-hoc test, $p=0.0152$).

Subsequently, the respondents indicated external financing for a household's current consumption expenditure (nearly 15% of units indicated this purpose as important or essential). However, the assessments of the importance of this goal were varied depending on: the financial situation of the household (including, among others, savings, income level), the location and composition of the household, and the education of the head of household. The discussed debt purpose was more important for households which have the lowest level of income (Kruskal-Wallis test, $p=0.0001$, Dunn's posthoc test, $p=0.005$), have not recorded a constant increase in income since 2004 (Mann-Whitney U test, $p<0.0001$), do not accumulate savings (Mann-Whitney U test, $p=0.0043$) and encountered difficulties in accessing financial services and products (Mann-Whitney U test, $p=0.0281$).

The indebtedness on this account is also a more important purpose for units in which paid work is performed by less than half the people in the household (Kruskal-Wallis test, $p=0.0288$, Dunn's post-hoc test, $p=0.05$), located in the city with more than 50 thousand inhabitants - compared to smaller towns (Kruskal-Wallis test, $p=0.0071$, Dunn's post-hoc test, $p=0.00567$), and for entities where the reference person had at most basic vocational education, compared to people with higher education (Kruskal-Wallis test, $p=0.0198$, Dunn's post-hoc test, $p=0.0141$).

Among the remaining debt purposes, the surveyed households also indicated: household investments, education of children, financing of expenses related to

treatment and health care, and going on vacation. Among other purposes, financing expenses related to unforeseen events were also indicated.

6. Conclusions

The research aimed to identify and evaluate the socio-economic determinants of Central Pomerania household indebtedness (at the household level) using non-parametric statistical tests and multiple correspondence analysis. Based on the literature review and the questionnaire's data, the analyzed household characteristics were selected and assigned appropriate categories. Using non-parametric statistical tests, was established that there is a statistically significant relationship between debt and the following household characteristics:

- development phase
- size and composition of the household (number of people, the share of members doing paid work, the share of children)
- socio-economic type
- location of the household
- a form of residential unit ownership
- age of the household head
- having economic education by the head of the household
- the level of average monthly income per person in the household.

Using multiple correspondence analysis, further analyses made it possible to identify the features of households that most often had liabilities and those households that did not have debt. The obtained results prove that the household's development phase and the socio-economic type (determined based on the main source of income) significantly affect indebtedness.

Our research showed that the most common indebted households were those whose main income source was income obtained from business activity. It also was entities with more than 3 members and households with dependent children (share of children > 0, marriage/partnership with dependent children). The greater the number of people in a household, the higher and more varied it is needed. An important role in this regard is the dependency ratio (Loichinger, Hammer, Prskawetz, *et al.*, 2017).

This indicator is calculated as the number of people who do not provide income to the household (e.g., children, unemployed people) to the total number of people in this household. The number of dependent children compared to the total number of people making up the household results in a higher value of the demographic dependency ratio. The higher the value of this indicator, the higher the household income spent on consumption. In a situation where the income achieved in each period exceeds the household expenses, the household may use previously accumulated savings or use an external source of financing, e.g., credit or a loan.

On the other hand, the category of lack of debt applied to older people (development phase: a single household, an older adult and a middle-aged or elderly marriage/partnership with no dependent children), whose main source of income was retirement and disability pensions, with no dependent children. In this respect, the results of our research are consistent with the assumptions of the Life Cycle Hypothesis. Simultaneously, the conducted analysis proves that the lack of debt was associated with the head of the household's primary education.

Our research results also showed that the socio-economic characteristics of households influence not only the propensity to incur debt but also the purposes and forms of incurring liabilities by households. Households characterized by a higher level of income recorded a constant increase in income in the analyzed period. A higher education level characterized them, incurred liabilities primarily to buy a house/apartment using banks' mortgage loans.

Moreover, the obtained results indicate that households with a lower income level, who encountered difficulties in accessing financial services and products, incurred liabilities primarily to meet the household's current needs. Thus, the demand for credit in these households may be caused by the necessity to meet the needs of a lower order (about A. Maslow's hierarchy of needs). Moreover, these households were characterized by a higher debt ratio of non-bank loans and informal loans (from family/friends).

The obtained research results contribute to the literature, constituting a thread in the discussion on the factors determining household debt and practice. Our study complements the results of previous research on household debt determinants, confirming the important role of socio-economic factors in the process of making financial decisions regarding debt. In practice, the results obtained in this research may be a source of information for credit institutions interested in adjusting the product offer to households' needs because these households - as our research results show - differ in several socio-economic characteristics. The results obtained during this research may also constitute an important source of information for institutions that support limiting the scope of financial exclusion among households.

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