Research article

Multidimensional assessment of the financial position of Polish households and its regional diversity

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A B S T R A C T

The article aims to present a multidimensional assessment of Polish households' financial position and its regional diversity in 2018. In the first stage of the assessment, the financial position was compared between voivodeships in a one-dimensional approach, taking into account the level of equivalent disposable income and total expenditure, the savings rate, the shares of food, and housing expenditures. In the second stage, a multidimensional assessment of the financial position was performed, based on the value of the synthetic indicator constructed with the TOPSIS method. Additionally, TOPSIS-based typological classes helped account for determinants of the financial position and subjective evaluation of households in each voivodeship. The article drew on unpublished individual data from the Household Budget Survey conducted by the Central Statistical Office of Poland in 2018. Analyses from both stages showed that the households in Mazowieckie and Dolnośląskie voivodeships enjoyed the best financial position, followed by Śląskie and Opolskie, while in Podkarpackie, Podlaskie, Warmińsko-Mazurskie, and Świętokrzyskie – the worst. With regards to Zachodniopomorskie and Wielkopolskie voivodeships, the financial position of their households was similar to the national average. The reasons for these disparities are social, economic, and demographic and include professional activity (being unemployed), the level of education of household head, location, and meeting debt obligations.

1. Introduction

Households are basic units in the economy and managing entities that make a number of important decisions that affect the development and life of its members and those around them (Starczewska, 2009). Residents of households share income, resources, and expenses that are adjusted to their needs, to some extent, due to certain limitations (Casimir and Tobi, 2011). The household sector influences the entire economy through its partial impact on its size and its fundamental involvement in the financial sector by means of, i.a., taking loans and investing savings (Santoso and Sukada, 2009). Moreover, households are the most important entities in the market that ensure the factor of production - labour, without which enterprises and other institutions would not have customers to produce goods for and to provide various types of services to, and the state would not have consumers among whom the produced resources could be allocated. All processes in the economy begin and end in a household (Świetlik, 2011). Meeting the needs of household members is related to their current and future financial position and the knowledge that allows allocating resources in a competent and effective way (Kozera, 2016).

The assessment of the financial position of households is important because it is one of the most important factors of their financial security, which is the fundamental goal of every household. The financial security of a household affects the economic security of the state, which, apart from military and political security, constitutes the basis for the development of economic entities and the stable growth of the state. The financial position of households, more specifically their financial security, may be the subject of macroeconomic research because social phenomena and processes depend on the situation of households (Kata et al., 2021).

Due to the importance of the financial position of households and its impact on the entire economy, the article aims to assess the financial position of households in Poland in 2018, from a regional perspective, and to identify the most important determinants of the position. The assessment of the financial position of households is performed in one-dimensional and multidimensional approach.

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A voivodship is the highest-level administrative unit of Poland, which corresponds to a province in other countries. There are 16 voivodships with areas that roughly match the historic boundaries of the last ten centuries. Mainly for historical reasons, the economic development of the voivodships remains unequal today – the western and central regions are better developed, and eastern voivodships lag behind. The differences translate into unemployment rates and job opportunities, which in turn are reflected by the financial situation of the households. The list of voivodships includes (from west to east): Dolnośląskie, Lubuskie, Zachodniopomorskie, Wielkopolskie, Pomorskie, Opolskie, Śląskie, Kujawsko-Pomorskie, Łódzkie, Mazowieckie (with national capital Warsaw), Małopolskie, Świętokrzyskie, Warmińsko-Mazurskie, Podlaskie, Lubelskie, Podkarpackie. This ranking correlates highly with a list ordered by the gross domestic product.

The goal of each local community living in a certain region is economic development by increasing the standard of living of its residents. The surroundings of households influence their financial position and the conditions in which they operate. Financial position is determined by many factors. One of the main causes of social inequality and, as a result, income inequality in society, is the different level of development of specific regions and unequal access to basic natural resources, labour resources and capital resources (Mikula, 2020). The formation of the so-called industrialised regions (agglomerations) that attract the most developed sectors of the economy and concentrate the largest enterprises is conducive to achieving higher income of household members in those areas (Opolski and Dworznik, 2012).

It should be noted, however, that along with the development of infrastructure, some limitations disappear. The development of transport and communication infrastructure reduces the distance or accessibility to certain property resources, and the labour resources are also available to a greater extent (Tuziak, 2019). Along with the development and economic growth, the external conditions of functioning of societies and regional economies, including households, are transformed (Tuziak, 2019).

The main creators of development in each region are large urban agglomerations (Kłoska (2012); Wójtowicz (2016); Kowalewska (2015); Wakula (2017); Michonia (2017); Malina (2020)). High spatial differentiation is noticed between the western regions, which are characterised by a high level of development, and underdeveloped eastern Poland, as well as the leader of the development in the country - the central region. Based on the conducted research, it can be concluded that the highest level of economic development in 2017 was achieved by Mazowiecko-Mazurskie and Podkarpackie voivodships (Malina, 2020). The reason for regional discrepancies can be explained by the assumptions of cohesion policy and its integration into the European Union related to the regions of Peace: Lower Silesia, Lublin, Podkarpackie voivodships (Kasprzyk and Leszczyńska, 2012; Urzig (2013), Pizio and Mazurkiewicz-Pizio (2014), Strzelecka (2017), Grzywińska-Rapca and Kobylińska (2019) confirm the significant regional discrepancies in the financial position of households in Poland. The lowest level of prosperity of household members is observed in the eastern regions of the country (Podkarpackie and Lubelskie voivodships), while the best financial position is noticed in Mazowiecko-Mazurskie Voivodship. The main reason for the regional discrepancy among Polish households and the households in other countries of the European Union related to the financial position are social, economic and demographic factors, as well as the level of wealth and economic potential of a given region. Moreover, it is often pointed out that the discrepancies in society with regards to income are among the determinants that affect the disparities and differentiation of living conditions, and the occurrence of inequality is inevitable and necessary in the motivational process in consumer behaviour (Grzywińska-Rapca and Kobylińska, 2019).

Scientists who have studied the financial position of households in other countries have come to similar conclusions. Anderloni, Bacchiocchi and Vandone (2012) examined the financial position of Italian households using the financial stability index and assessed the financial difficulties of households taking into account socio-demographic and economic determinants. According to the conducted analysis, there is financial instability in households, which is determined by the level of debt service, which is positively correlated with financial instability, and this effect is stronger in the case of households with unsecured debt, i.e. consumer credit. Financial instability increases in the case of impulsive individuals who may adopt impatient, short-sighted patterns of behaviour which makes it difficult for them to become fully aware of the consequences of their financial and spending decisions, while higher levels of education contribute to reduced financial instability (Anderloni et al., 2012).

Mahdzan et al. (2019) conducted research on the differences among the determinants of the Malaysian economy. The scientists have noticed that objective measures indicate positive signals, while subjective perceptions of consumers illustrate a pessimistic approach with regards to the economy.

Following the study on the prosperity of Malaysian households, significant differences in subjective financial well-being between low-, middle- and high-income households were noticed. The conducted analysis showed that financial behaviour and sense of control are characterised by a significant positive correlation with subjective financial well-being, while financial stress and financial knowledge are characterised by a significant negative correlation with subjective financial well-being across all households. In contrast, in the group of low-income households, financial knowledge was not significantly correlated with subjective financial well-being.

Noerhidajatia et al. (2021) conducted an assessment of the level of financial vulnerability of households in Indonesia using data from the Household Balance Survey in the period from 2016 to 2017 (Survei Neraca Rumah Tangga/SNRT). The analysis proved that objective and subjective measurements of the financial vulnerability index demonstrated that the financial vulnerability of Indonesian households was strongly influenced not only by income factors but also by behavioural characteristics related to finance plus several socio-economic factors.

2 Materials and methods

The research material for the study consisted of unidentifiable individual data from the Household Budget Survey conducted by Central Statistical Office of Poland in Warsaw in 2018. The survey covered 36,166 households and was conducted using a representative method, which makes it possible to generalise the results obtained for all households in Poland (Central Statistical Office of Poland, Methodological report... 2018).

In the first stage of the research, the comparison of the financial position of households between voivodships was made in a one-dimensional approach. The average levels of the following characteristics, adopted as partial indices of financial position, were analysed:

- equivalised disposable income1,
- equivalised total expenditure,
- savings rates2,

1 To compare income and expenditure of households of different sizes and demographic composition, a modified OECD scale recommended by EUROSTAT was used, in which a weight of 1 is assigned to the first adult in the household, a weight of 0.5 to other adults, and a weight of 0.3 to children (cf. Dudek, 2011, p. 13, Wołoszyn, 2020, p. 84-85).
2 The household savings rate was defined as the quotient of difference of disposable income and expenditure to disposable income (Futa et al., 2013, p. 17, Wołoszyn, Glowicka-Wołoszyn 2015, p. 736).
the share of food expenditure in total expenditure,
- the share of expenditure on housing maintenance.

In the second stage of research, a multidimensional assessment of the financial position of households was performed, based on the value of the synthetic indicator constructed with the use of TOPSIS method (Technique for Order Preference by Similarity to an Ideal Solution) method (Hwang and Yoon 1981; Wysocki 2010), in the case of which the basis for determining the value is the distance of each object (household) from the adopted ideal and negative ideal of development (cf. Glowicka-Wołoszyn et al., 2018; Wołoszyn et al., 2019). The construction of the synthetic indicator was based on the values of partial indices used in the first stage of the study, the first three of which were adopted as stimulants and the last two as destimulants of the financial position of households.

To bring the values of the partial indices to comparability, they were normalised using the procedure of zero unitarisation (Kukula, 2000) for:

\[
\text{stimulant: } z_k = \frac{x_k - \min_i [x_k]}{\max_i [x_k] - \min_i [x_k]},
\]

\[
\text{destimulant: } z_k = \frac{-x_k + \max_i [x_k] - \min_i [x_k]}{\max_i [x_k] - \min_i [x_k]},
\]

where: \(x_k\) - observation value of the k-th characteristic (partial indicator) for the \(i\)-th object (household), \(k = 1, 2, \ldots, K, i = 1, 2, \ldots, N, (k = 7, N = 730)\).

The maximum and minimum values for each of the partial indices were taken as model values (values of ideal and negative ideal):

\[
A^+ = \left(\max_i (x_{1i}), \max_i (x_{2i}), \ldots, \max_i (x_{ki})\right) = (z_{1i}^+, z_{2i}^+, \ldots, z_{ki}^+),
\]

\[
A^- = \left(\min_i (x_{1i}), \min_i (x_{2i}), \ldots, \min_i (x_{ki})\right) = (z_{1i}^-, z_{2i}^-, \ldots, z_{ki}^-).
\]

Due to the strong right-hand asymmetry of the values of the partial indices, the model values were adjusted using the quartile criterion (Tukey, 1977; Glowicka-Wołoszyn, Wysocki 2018; Glowicka-Wołoszyn and Wysocki 2020). The above means that the model values of individual partial indices were determined in the set of objects, ignoring those outside the range:

\[
(Q_i - 1.5 \cdot IQR, Q_i + 1.5 \cdot IQR)
\]

where: \(Q_1, Q_3\) - first and third quartiles from the sample.

\(IQR\) - interquartile range.

Then, for individual indices of the financial position, the Euclidean distances of each object (household) from the adopted model values were calculated:

From the ideal:

\[
d_i^+ = \sqrt{\sum_{k=1}^{K} (z_k - z_{ki}^+)^2}
\]

From the negative ideal:

\[
d_i^- = \sqrt{\sum_{k=1}^{K} (z_k - z_{ki}^-)^2}
\]

where: \(i = 1, \ldots, N\).

In the next stage of the study, the values of the synthetic indicator of financial position were calculated for each of the 36,166 assessed households using the TOPSIS method:

\[
q_i = \frac{d_i^-}{d_i^+ - d_i^-},
\]

where: \(i = 1, \ldots, N\), \(0 \leq q_i \leq 1\).

Based on the obtained values of the synthetic indicator, households were classified in terms of synthetic assessment of their financial position. A statistical criterion was adopted, using the arithmetic mean \(\bar{q}\) and standard deviation \(s_q\) of the values of the synthetic indicator for all households in Poland (Wysocki 2010). As a result, four classes of assessment of financial position of households were distinguished:

- Class I (high evaluation of financial position)
  \[q_i \geq \bar{q} + s_q\]
- Class II (medium-higher evaluation of financial position)
  \[q_i \leq q_i < \bar{q} + s_q\]
- Class III (medium-lower evaluation of financial position)
  \[q_i < \bar{q} - s_q\]
- Class IV (low evaluation of financial position)
  \[q_i < q_i\]

In each voivodship, the structure of households classified in terms of their financial position was presented separately, and the typological classes were characterised based on average values of partial indices.

Additionally, in each voivodship, the typological classes were characterised taking into account the following features, considered to be the determinants of the financial position of households:

- percentage of households with unemployed persons,
- percentage of households managed by individuals with a university degree,
- percentage of large city households, i.e., located in a city of more than 100,000 residents,
- percentage of households that are heavily burdened by debt and are unable to meet their debt obligations on an ongoing basis.

Moreover, in the typological classes for assessing the financial position, the subjective assessment of households was presented on:

- ways of managing household budget - what percentage of households can afford certain luxuries and the needs of all members of the household are met, and what percentage of households has to watch their expenditure on a daily basis or is not able to afford basic needs;
- saving opportunities - what percentage of households saves regularly.

3. Study results

Members of households offer a productive factor such as labour in return for services, generate income, which depends on the position held, the type of performed work, education and qualifications (profession) (Szczecińska, 2020). Income and expenditure vary not only between economic and social groups but also depend on the geographical area of residence of household members.

The development of certain regions or voivodships has an impact on the level, dynamics and structure of revenue and expenditure. Therefore, it is reasonable to analyse the diversification of income and expenditure of household members by voivodship (Borowska, Mikuła, Raczkowska, Utzig, 2020).

Based on empirical data, it has been observed that the average level of equivalent income of households in less than half of the voivodships is higher than the level of income in Poland. The average equivalent income of households in 2018 amounted to PLN 2483 and was 15% higher than the average equivalent income in Podkarpacie Voivodship and 12% lower than the highest average income generated by households in Mazowieckie Voivodship (Table 1). The average monthly level of equivalent income of households in Mazowieckie Voivodship was 31% higher than equivalent income generated by the households in...
Podkarpacie Voivodship. A higher level of income, compared to households in Poland, was also reported in the following voivodships: Dolnośląskie, Lubuskie, Małopolskie, Pomorskie, Śląskie and Zachodniopomorskie. Households in Wielkopolskie and Zachodniopomorskie voivodships generated income comparable to the average income in Poland.

In turn, while assessing the average level of equivalent expenditure in Poland in 2018, it amounted to PLN 1777. Having analysed the differences between households across voivodships in terms of average expenditure, in most of the cases, slightly higher differences between households in individual regions and average expenditure in Poland were noticed than while comparing the level of equivalent income. The highest and lowest levels of equivalent expenditure by households in 2018, were recorded in Mazowieckie and Warmińsko-Mazurskie voivodships, respectively. The average expenditure of households in Mazowieckie Voivodship was 33% higher than in Warmińsko-Mazurskie Voivodship. Highest average expenditure than national equivalent expenditure was observed in Dolnośląskie, Łódzkie, Opolskie, Pomorskie, Śląskie and Zachodniopomorskie voivodships. Comparable average expenditure, equivalent to the national level, was reported by households in Kujawsko-pomorskie, Lubuskie and Zachodniopomorskie voivodships.

Average level of equivalent disposable income and total expenditure of households by voivodship as % of the national average.

It is worth noting that the share of average equivalent expenditure in the average income of households in Poland (72%) is at a similar level to that of households with the best and the worst income position (households in Mazowieckie Voivodship (72%) and Podkarpackie Voivodship (73%)). The lowest share of expenditure in income was recorded for the households in Warmińsko-mazurskie Voivodship (65%), while the highest share was recorded for the households in Opolskie Voivodship (80%).

Having analysed the average monthly savings rate of households, which is at the level of 28.4% in Poland, it should be noted that it is lower by 6.4 p.p. than the savings rate in the case of households in Małopolskie Voivodship and by 8.5 p.p. higher than in the case of households located in Opolskie Voivodship. In turn, the highest savings rate was recorded in the households in Małopolskie Voivodship (35%), while the lowest in Opolskie Voivodship (20%).

Based on studies on financial position conducted by other researchers, expenditure reflects the prosperity of a household in a better way than disposable income. It can be concluded that the savings rate also does not reflect the wealth of household members. Research conducted by Świecka and Musial (2016) for households located in the largest cities in Poland, give rise to the conclusion that current income is not the main determinant of prosperity and there is no statistical correlation between income and savings. Thus, the level of income does not necessarily determine the level of savings in households (Świecka, Musial, 2016).

Households allocate the largest portion of their income on goods related to living needs, i.e., on food and non-alcoholic beverages as well as housing maintenance and energy products. A higher share of this expenditure to total expenditure indicates a lower standard of living of household members. According to a study conducted by Borowska, Mikula, Raczkowska and Utzig (2020), in 2006, households allocated more than half of their consumption funds on the above-mentioned products, while in 2018, the share of expenditure on those products in consumption expenditure decreased to approximately 45%, which allowed to state that the standard of living of households was improving.

Having analysed the share of food expenditure in total expenditure, households in Poland allocate 25% of total expenditure on basic needs. The same percentage of expenditure on food is recorded by the households in Pomorskie Voivodship. The largest percentage of expenditure on food (29.5%) is noticed in the households in Podlaskie Voivodship, while the households in Mazowieckie Voivodship allocate the smallest percentage of expenditure to that purpose (22%). Polish households, as well as households in Pomorskie Voivodship, allocate 18% of their total expenditure to housing maintenance. It has been observed that the members of households in Małopolskie Voivodship allocate approximately 21% of their expenditure to housing maintenance, while the lowest percentage of expenditure is allocated to that purpose by the

| Voivodship                  | Average monthly level (PLN) | Average as % of the average level in Poland |
|----------------------------|-----------------------------|--------------------------------------------|
|                            | Equivalent income           | Equivalent expenditure | Equivalent income | Equivalent expenditure |
| Dolnośląskie (DSL)          | 2566                        | 1875                        | 103.3             | 105.5                |
| Kujawsko-pomorskie (KPM)    | 2383                        | 1753                        | 96.0              | 98.6                 |
| Lubelskie (LBL)             | 2196                        | 1650                        | 88.4              | 92.9                 |
| Lubuskie (LBS)              | 2530                        | 1754                        | 101.9             | 98.7                 |
| Łódzkie (LIZ)               | 2369                        | 1830                        | 95.4              | 103.0                |
| Małopolskie (MPL)           | 2511                        | 1636                        | 101.1             | 92.1                 |
| Mazowieckie (MZW)           | 2775                        | 2002                        | 111.7             | 112.6                |
| Opolskie (OPL)              | 2356                        | 1869                        | 84.1              | 105.2                |
| Podkarpackie (PKR)          | 2112                        | 1542                        | 85.1              | 86.8                 |
| Podlańskie (PLS)            | 2285                        | 1549                        | 92.0              | 87.2                 |
| Pomorskie (PMR)             | 2535                        | 1894                        | 102.1             | 106.6                |
| Śląskie (SLs)               | 2640                        | 1893                        | 106.3             | 106.5                |
| Świętokrzyskie (SWK)         | 2358                        | 1597                        | 90.9              | 89.9                 |
| Warmińsko-mazurskie (WRM)   | 2298                        | 1501                        | 92.5              | 84.5                 |
| Wielkopolskie (WPL)         | 2477                        | 1658                        | 99.7              | 93.3                 |
| Zachodniopomorskie (ZPM)    | 2486                        | 1797                        | 100.1             | 101.1                |
| Poland                     | 2483                        | 1777                        | 100.0             | 100.0                |

Note: darker green indicates the values of household income and expenditure higher than the national average, light green - only income was higher than the national average, yellow - only expenditure was higher than the national average.

Source: Authors' own study based on Household budgets, 2018.
households in Lubelskie Voivodship (15%). Lower values of the share of expenditure on food and housing maintenance in total expenditure have been recorded in Dolnośląskie, Łódzkie, Mazowieckie and Opolskie voivodships compared to the share of that kind of expenditure in total expenditure in the entire country. The above may indicate a better financial position, although those areas do not always achieve the highest equivalent income and are characterised by low savings rate (Łódzkie and Opolskie Voivodships) (Table 2). The largest share of expenditure on living needs in total household expenditure was observed in the households in Warmińsko-mazurskie Voivodship (48.8%), which may indicate a lower standard of living of the members of those households. It should be noted that the savings rate of the households in Warmińsko-mazurskie Voivodship is one of the largest in the country and amounts to 34.7%, and expenditure - the lowest among the assessed areas (PLN 1,501). The above suggests that those households do not allocate the expenditure on higher needs but save the money instead.

To analyse the financial position of households in Poland thoroughly, taking into account regional discrepancies, a multidimensional analysis was performed based on the value of the constructed synthetic indicator and subjective assessment of households. The median value of the synthetic indicator for Polish households (0.472) in 2018 ranged from 0.367 to 0.577, which indicated their average financial position (Figure 1).

In conclusion, financial position of 37.5% of Polish households was medium-low, with values between 0.367 and 0.472, while financial position of 30.5% of Polish households was medium-high, with values between 0.472 and 0.577. It was estimated that financial position of 15.5% of the households was low, while financial position of 16.5% of the households was high (Table 3).

While considering the allocation of individual households to particular classes by voivodship, it was observed that the largest percentage of households in all voivodships belonged to Class III, which meant a lower financial position, although those areas do not always achieve the highest equivalent income and are characterised by low savings rate (Łódzkie and Opolskie Voivodships) (Table 2). The largest share of expenditure on living needs in total household expenditure was observed in the households in Warmińsko-mazurskie Voivodship (48.8%), which may indicate a lower standard of living of the members of those households. It should be noted that the savings rate of the households in Warmińsko-mazurskie Voivodship is one of the largest in the country and amounts to 34.7%, and expenditure - the lowest among the assessed areas (PLN 1,501). The above suggests that those households do not allocate the expenditure on higher needs but save the money instead.

Table 2. Discrepancies in the savings rate and share of expenditure on food and on housing maintenance in total household expenditure by voivodship.

| Voivodship         | Average monthly level (%) | Average level in the voivodship versus average level in Poland (pp) |
|--------------------|---------------------------|---------------------------------------------------------------------|
|                    | Savings rate | Share of food expenditure in total expenditure | Share of expenditure on housing maintenance in total expenditure | Savings rate | Share of food expenditure in total expenditure | Share of expenditure on housing maintenance in total expenditure |
| Dolnośląskie (DSL) | 26.9         | 23.5                                                 | 18.1                                                   | -1.5         | -1.7                                                 | -0.3 |
| Kujawsko-pomorskie (KPM) | 26.5       | 26.4                                                 | 18.5                                                   | -2.0         | 1.2                                                  | 0.1 |
| Lubelskie (LBL)    | 24.8         | 26.6                                                 | 15.2                                                   | -3.6         | 1.4                                                  | -3.2 |
| Lubuskie (LBS)     | 30.7         | 26.0                                                 | 20.1                                                   | 2.2          | 0.8                                                  | 1.8 |
| Łódzkie (LDZ)      | 22.8         | 24.2                                                 | 17.9                                                   | -5.7         | 0.3                                                  | 0.5 |
| Małopolskie (MPL)  | 34.8         | 27.2                                                 | 20.9                                                   | 6.4          | 1.9                                                  | 2.6 |
| Mazowieckie (MZW)  | 27.9         | 22.2                                                 | 16.6                                                   | -0.6         | -5.1                                                 | -1.6 |
| Opolskie (OPL)     | 20.0         | 24.2                                                 | 15.9                                                   | -8.5         | -1.0                                                 | -2.5 |
| Podkarpackie (PKR) | 27.0         | 28.9                                                 | 17.1                                                   | -1.4         | 3.7                                                  | -1.2 |
| Podlaskie (PLS)    | 32.2         | 29.5                                                 | 16.7                                                   | 3.3          | 4.2                                                  | -1.7 |
| Pomorskie (PMR)    | 25.3         | 25.2                                                 | 18.4                                                   | -3.2         | 0.0                                                  | 0.0 |
| Śląskie (SL)       | 28.3         | 24.1                                                 | 19.8                                                   | -0.1         | -1.2                                                 | 1.4 |
| Świętokrzyskie (SWK) | 29.3       | 28.2                                                 | 18.5                                                   | 0.8          | 2.9                                                  | 0.2 |
| Warmińsko-mazurskie (WRM) | 34.7     | 28.7                                                 | 20.1                                                   | 6.2          | 3.5                                                  | 1.7 |
| Wielkopolskie (WPL) | 33.1        | 26.6                                                 | 20.1                                                   | 4.6          | 1.2                                                  | 1.7 |
| Zachodniopomorskie (ZPM) | 27.7      | 25.6                                                 | 19.3                                                   | -0.7         | 0.4                                                  | 0.9 |

Note: green indicates values greater than the national average for stimulants and lower - for destimulants.

Source: Authors' own study based on Household Budgets, 2018.
Figure 1. Distribution of values of the synthetic indicator for the assessment of the financial position of households by voivodship. Source: Authors’ own study based on Household budgets, 2018.

Table 3. Identification of the rating classes of financial position of Polish households according to voivodship.

| Specification                        | Financial position classes of households | Total | Median value of the synthetic indicator | Ranking of voivodships based on the median of the synthetic indicator for assessment of financial position |
|--------------------------------------|-----------------------------------------|-------|----------------------------------------|-------------------------------------------------------------------------------------------------|
| Class number                         | IV II III I                              |       |                                        |                                                                                                |
| Assessment of the financial position | low medium-low medium-high high         |       |                                        |                                                                                                |
| Synthetic measure values             | (0.116; 0.367) (0.367; 0.472) (0.472; 0.577) (0.577; 0.886) |       |                                        |                                                                                                |
| Percentage of households in Poland   | 15.5 37.5 30.5 16.5                      | 100   | 0.472                                  |                                                                                                |

Percentage structure of households in voivodships according to typological class of financial position

| Specification                        | Total | Median value of the synthetic indicator | Ranking of voivodships based on the median of the synthetic indicator for assessment of financial position |
|--------------------------------------|-------|----------------------------------------|-------------------------------------------------------------------------------------------------|
| Dolnosląskie (DSL)                   | 14.0  | 0.481                                  | 2                                                                                                |
| Kujawsko-pomorskie (KPM)             | 18.0  | 0.463                                  | 11                                                                                              |
| Lubelskie (LBL)                      | 15.1  | 0.464                                  | 9                                                                                                |
| Lubuskie (LBS)                       | 17.8  | 0.468                                  | 7                                                                                                |
| Łódzkie (LDZ)                        | 15.6  | 0.470                                  | 6                                                                                                |
| Łódzkie (LDZ)                        | 16.8  | 0.463                                  | 10                                                                                              |
| Malopolskie (MPL)                    | 13.0  | 0.501                                  | 1                                                                                                |
| Mazowieckie (MZW)                    | 13.0  | 0.480                                  | 3                                                                                                |
| Podkarpackie (PKR)                   | 17.6  | 0.448                                  | 15                                                                                              |
| Podlańskie (PLS)                     | 22.7  | 0.449                                  | 14                                                                                              |
| Pomorskie (PMR)                      | 14.0  | 0.478                                  | 5                                                                                                |
| Śląskie (SLS)                        | 12.5  | 0.480                                  | 4                                                                                                |
| Świętokrzyskie (SWK)                  | 17.3  | 0.455                                  | 13                                                                                              |
| Warmińsko-mazurskie (WRM)            | 22.3  | 0.447                                  | 16                                                                                              |
| Wielkopolskie (WPL)                  | 16.5  | 0.467                                  | 8                                                                                                |
| Zachodniopomorskie (ZPM)             | 17.6  | 0.462                                  | 12                                                                                              |

Source: Authors’ own study based on Household budgets, 2018.
ranging from 31% in households with a low assessment of financial position through 23% and 17%–12% in households with a high assessment of financial position. When analysing food expenditure in total expenditure, the rule formulated by Ernest Engel is proved regarding the distribution of income and demand for food. According to this rule, as households get richer, their share of food expenditure decreases, but once a household reaches the saturation point then food demand does not respond to income growth (Cirera and Masset, 2010).

It is observed that 49% of the richest households and 3% of the households with a low assessment of financial position declare that they can afford some luxury and they have enough money without special saving. Referring to the total number of Polish households, 18% of members take the same view. On the other hand, 65% of households with a low assessment of their financial position indicate that they have to manage very frugally on a daily basis or are not even able to afford basic needs, while only 4% of the wealthiest members agreed with this opinion. It should also be noted that only 1% of the wealthiest households are heavily burdened by debt and they are unable to meet their debt obligations on an ongoing basis. In contrast, in households with a low assessment of their financial position, debt is only a problem for 5% of this group. When analysing declarations of households concerning saving, it was found that 19% of all Polish households put aside a part of their income on a regular basis, compared to 40% of the richest households and 6% of the poorest ones (Table 6).

When analysing the financial position of households according to voivodship, considering the rating classes, the best income position in all classes was found in Małopolskie and Zachodniopomorskie voivodships. Higher disposable income compared to average equivalent income outside the class with the highest financial rating (Class I) is observed in Dolnośląskie, Lubuskie, Śląskie and Wielkopolskie voivodships. When analysing the differentiation in total equivalent expenditure, the best situation is observed in the households of Łódzkie, Mazowieckie, Śląskie and Zachodniopomorskie voivodships. The highest rate of household savings in all classes was observed in Dolnośląskie, Łódzkie and Śląskie voivodships, while the lowest percentage of total expenditure on housing maintenance was found in Lubelskie, Opolskie, Podkarpackie and Podlaskie voivodships.
Studies conducted by Kasprzyk and Leszczyńska (2012), Utzig (2013), Pizło and Mazurkiewicz-Pizło (2014), Strzelecka (2017), Grzywinska-Rapca and Kobylińska (2019) confirm the significant discrepancies in the financial position of households in Poland. The retrospective analysis also revealed that households from Mazowieckie voivodship have the highest income position, while voivodships from the eastern region (Podkarpackie, Podlaskie, Lubelskie) have the worst income position. Following the analyses conducted by Malina (2020) of the spatial differentiation of the level of socio-economic development of Polish voivodeships in 2017, it can be observed that the voivodeships with, according to her, the highest level of development (Mazowieckie, Dolnośląskie) and the lowest level of development (Warmińsko-Mazurskie and Podkarpackie) are voivodeships in which, similarly, households are characterised by the best and worst income position as indicated also by the median value of the synthetic indicator and the ranking created on its basis (Table 3). Furthermore, the Mazowieckie voivodship had the largest percentage of households classified as Class I with a high assessment of the financial position (26%). The Podlaskie voivodship had the highest percentage of Class IV households with a low financial position score (23%). In addition, the worst financial position is also observed in the Warmińsko-Mazurskie households that took the last place in terms of the median of the synthetic indicator for assessment of financial position. It should also be noted that 22% of the households of analyses conducted by Malina (2020) of the spatial differentiation of the level of socio-economic development of Polish voivodeships in 2017, it can be observed that the voivodeships with, according to her, the highest level of development (Mazowieckie, Dolnośląskie) and low level of development (Warmińsko-Mazurskie and Podkarpackie) are voivodeships in which, similarly, households are characterised by the best and worst income position as indicated also by the median value of the synthetic indicator and the ranking created on its basis (Table 3). Furthermore, the Mazowieckie voivodship had the largest percentage of households classified as Class I with a high assessment of the financial position (26%). The Podlaskie voivodship had the highest percentage of Class IV households with a low financial position score (23%). In addition, the worst financial position is also observed in the Warmińsko-Mazurskie households that took the last place in terms of the median of the synthetic indicator for assessment of financial position. It should also be noted that 22% of the households of
this voivodship were classified as Class IV households with a low assessment of the financial position.

The differentiation in the financial position of households depends mainly on the socio-economic development of Polish voivodships, which can be evidenced by the level of GDP per capita in individual voivodships (Table 7).

Moreover, determinants of the assessment of the financial position of households were indicated and identified. They were confirmed by the studies conducted by Kasprzyk and Leszczyńska (2012), Pizio and Mazurkiewicz-Pizio (2014), Mazurek-Krasodomska (2017). Namely, the reason for the discrepancy in financial position are factors of social, economic and demographic nature.

4. Conclusions

This article aimed to present an assessment of the financial position of Polish households and its regional diversity in 2018. The assessment followed both one-dimensional and multidimensional analyses and found the financial position of Mazowieckie and Dolnośląskie households to be the highest. These two voivodships hosted the highest shares of the first and second typological classes, comprising households with a high and medium-high financial position score (over 50%). They stood apart by the highest disposable income, a large percentage of great city households, and a small percentage of households with joblessness or inability to meet their debt obligations. Also, they were more frequently headed by individuals with a university degree. Subjectively, they also rated themselves high on savings, luxuries, and financial management.

The worst financial position was observed in the following voivodships: Warmińsko-Mazurskie, Podkarpackie, Podlaskie and Świętokrzyskie. In these voivodships, more than 60% were classified as the third and fourth classes households – with low or medium-low financial position scores. These households had a higher incidence of unemployment or inability to meet debt obligations and a high percentage of household heads without a university degree. They judged themselves hard-pressed to make ends meet and forced to economize – and they irregularly set aside part of their income.

Occupational activity, education level and location (the location of the household) are components of the environment that consequently affects the amount of disposable income in individual voivodships and the social differentiation within them. Observing, analysing and diagnosing the existing changes in income disparities in voivodships is an essential element of each country's policy, determining new areas of activity of local and central authorities in terms of social and economic policy objectives.

The research concerning household financial position is of great importance, as the position is one of the essential factors of households' financial security. Consequently, it affects the economic security of the country as well as its development. The conducted analysis confirmed the findings of several studies in the field. They had pointed out regional differences between the proxies of financial position of Polish households, such as income or expenditure. However, the article considered financial position within a broader framework – grounded its definition in concepts other than income or expenditure – and used multidimensional methods to evaluate it. This approach distinguishes the study from other analyses of regional differentiation in Poland in terms of household financial condition. Additional merits of the study, rarely found in those papers, are the identification of the position's determinants across regions and typological classes - and the inclusion of subjective self-assessment in terms of budget and savings management.

Declarations

Author contribution statement

Joanna Maria Kozak, Aldona Mrożewska-Kamińska: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Andrzej Woloszyn: Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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The data that has been used is confidential.

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The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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