

Consumption patterns of Slovak households in 2021 and 2022

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Abstract

Household consumption behavior is a key indicator of the economic situation and social disparities in society. The aim of this article is to analyze the similarities and differences in the structure of consumption expenditure of various types of Slovak households in 2021 and 2022. The study also focuses on the impact of demographic factors on spending behavior, examining how households in different income groups allocate their expenses. To identify and profile individual household segments, we applied cluster analysis, which enabled us to distinguish homogeneous groups of households based on their spending patterns. The analysis was based on data from the Household Budget Survey, provided by the Statistical Office of the Slovak Republic for scientific purposes. The results indicate that Slovak households can be divided into six main segments, with four segments displaying stable spending patterns over both analyzed years, and two where spending patterns varied from one of the studied years to another. The results emphasize significant differences between the expenditure structures of low- and high-income households, as well as among those of households with varying demographic compositions. Our findings contribute to a deeper understanding of Slovak households' consumption behavior and can be used in the development of socio-economic policies targeting various income and demographic groups.

Key words: households, Household Budget Survey, consumption, expenditure, cluster analysis.

1. Introduction

An analysis of household consumption expenditure is important from several points of view. Knowing the structure of consumer spending allows government bodies and economists to plan economic policies, allocate social benefits and tax breaks more effectively. It can also contribute to a better understanding of consumer behavior. Businesses and marketers can use segmentation to target their products and services to specific groups of households according to their needs and preferences. In addition, the

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analysis reveals social disparities between households with different incomes, which can be important in social policy-making or support for vulnerable groups.

The aim of this article is to identify and profile segments of Slovak households based on their consumption expenditures in 2021 and 2022. We focus on the impact of demographic factors on spending behavior and examine how households in different income groups allocate their spending. To achieve the set goal, we used the cluster analysis method.

We worked with anonymized microdata from the Household Budget Survey (HBS) on selected Slovak households for 2021 and 2022, which were provided by the Statistical Office of the Slovak Republic for scientific purposes. We worked with SAS Enterprise Guide (SAS EG) software to process and analyze the data.

The Household Budget Survey is a national statistical survey, the purpose of which is to obtain information on the amount, structure and development of monetary expenditures as well as incomes and non-monetary expenditures and incomes of people in different types of households, with the aim of using the information obtained to support public administration bodies in developing and monitoring public policies, implementing the European Statistical Programme, and assessing adjustments to subsistence minimum levels. Another objective of the Household Budget Survey is, for example, to use the obtained information as one of the bases for assessing the state of the company's economy, for analyzing the standard of living of the population and for international comparison with other countries (Vlačuha, Hornáček, Vargová, 2023). When determining consumption expenditure, the international classification of individual consumption according to the purpose of use (COICOP), recommended by Eurostat (2003) for statistics on family accounts, is used. According to this classification, consumption expenditure is divided into 12 basic divisions, as stated in the publication *Classification of Individual Consumption According to Purpose 2018* by United Nations (2023): Food and non-alcoholic beverages (FAB); Alcoholic beverages, tobacco and narcotics (ABT); Clothing and footwear (CLT); Housing, water, electricity, gas and other fuels (HSG); Furnishing, household equipment and routine household maintenance (FUR); Health (HLT); Transport (TRA); Communication (COM); Recreation and culture (CUL); Education (EDU); Restaurants and hotels (RES); Miscellaneous goods and services (MGS).

In addition to household income and expenditure, the basic demographic and socio-economic characteristics of households, such as the region from which the household originates, the number of household members, the number of dependent children or the main economic activity of the reference person, are also obtained when determining Household Budget Survey. The main objective of HBS at the national level is to calculate the weights for the consumer price index. HBS, was launched in the 1960s,

is carried out in all countries of the European Union and in most countries. Eurostat publishes the data collected by each EU member state at 5-year intervals (Eurostat, 2003).

To ensure comparability of survey data between countries and over time, methodologies and guides issued by Eurostat are used. The key document is the Household budget surveys in the EU: methodology and recommendations for harmonization from 2003. The purpose of this paper was to describe the current methodology used for HBS and to propose recommendations for further harmonization and improvement of the quality and comparability of survey data at the European level.

2. Literature review

In the literature, we can come across various studies that confirm the importance of HBS in the study of socio-economic trends as well as the use of cluster analysis in identifying similar groups of households.

Dogan et al. (2019) use HBS data for Turkey from 2017 and apply cluster analysis to identify different groups of households with different levels of health spending. The results show that household type, income, and factors such as physical activity influence health care spending.

Froemelt et al. (2018) use HBS data for Switzerland from 2009 to 2011 to identify different consumption patterns of household consumption and assess the environmental impacts associated with specific consumer behavior. In analysis, they use a two-level cluster analysis method to identify behavior patterns.

Değirmenci and Özbakır (2017) also look at the use of data mining techniques to analyze HBS data in Turkey. The authors applied cluster analysis to characterize household types.

HBS is a key source of microdata not only for analyzing consumption and savings, but also for analyzing poverty. Antonin (2020) examines the relationship between income and savings of French households. Bouzarovski and Tirado-Herrero (2016) examine energy poverty in Hungary, the Czech Republic and Poland, while Cupák et al. (2015) analyze food demand in Slovakia. The development and importance of HBS in the Czech Republic is mapped by Vopravil and Linhartová-Jiříčková (2024). Labudová et al. (2010) use HBS data and the principal components analysis to measure the socio-spatial dimension of poverty in the regions of Slovakia and the Czech Republic.

Morvay et al. (2005) focus on profiling groups of households according to income, namely:

- households with high pensions, whose expenditure structure consists of luxury commodities and who live an above-standard lifestyle,

- standard Slovak households, which represent the wider middle social classes and whose expenditure structure copies their income situation with a preference for saving consumption in addition to the consumption of essential needs,
- low-income households, whose incomes consist more of social resources and whose expenditure structure consists of meeting basic living needs with a deficit in basic elements of nutrition.

Across all income groups, the consumption structure prioritized food and housing-related services, although the share of essential expenditures varied. In the lowest income groups, spending on basic needs exceeded 50% of total expenditures. In the highest-income households, food accounted for approximately 20%, housing for 13%, and transport for 16% of total spending. These households also allocated more to holidays and culture. Meanwhile, education expenditures remained at 1% of total spending across all income groups.

Morvay et al. (2005) assume that expenditure on food and housing will represent the main component of consumer expenditure of Slovak households in the long term. In Slovakia, a model of expenditure structure has been fixed, according to which families spend the largest share of consumption expenditure on food and non-alcoholic beverages. It is assumed that consumption will continue to copy the state of real incomes, and it will take a longer period of time to approach the expenditure structure of the European Union countries. Households in the European Union have the highest expenditures on housing and transport, spending less on food and clothing, and more on culture and recreation.

Morvay (2023) monitors the consumption of Slovak households, which grew in 2022 despite many negative factors and crises, such as inflation, the energy and price crisis. Possible causes of the massive growth in consumption are compensation for postponed consumption during the pandemic period, state aid, employment growth, or the accumulation of stocks due to fears of further price increases or concerns about the effects of the war. In this period, there was also a dramatic decline in the creation of savings, not only of households, but in the overall economy of the Slovak Republic. Households are losing caution in creating savings, because they are convinced that even in future crises, the state will help them compensate for the negative impacts with the help of public funds, while the role of the state is only to mitigate shocks and fluctuations in the economy. The author suggests that economic policy should consider new phenomena in the behavior of households and not create unrealistic expectations towards the state. At the same time, he recommends that aid should be concentrated on those who are at risk of poverty or cannot cope with economic shocks.

Inflation has a significant impact on the increase in food, energy and gasoline prices. Slovaks donate most of their income to provide basic needs such as food and housing. Opportunities for savings in these areas can be buying cheaper food or using

energy more efficiently. However, it is easier to cut back on other expenses such as culture, entertainment, travel, clothing, and restaurants. These aspects can be replaced by cheaper alternatives or can even be eliminated altogether. On the contrary, it is impossible to completely omit basic needs. High inflation leads to certain changes in consumer behavior. However, inflation is not the only reason for rising food and energy prices, there have been many negative events such as the economic crisis, refugee crisis, pandemic or war recently, which affect not only the prices of consumer items, but also consumer behavior (Galvánková, 2022).

The benefit of the classification of Slovak households in this article for 2021 and 2022 based on HBS is not only the profiling of consumer behavior according to the structure of expenditure, but also the consideration of income, household type and household structure by age.

3. Methodology

3.1. Principal Component Analysis

Most input variables do not satisfy the assumption of independence required for cluster analysis. To address this, we first applied the principal component method, which transformed the original variables into independent principal components. These new variables were then used for clustering.

Principal Component Analysis (PCA) is a statistical technique that uncovers hidden relationships among observed variables. Its primary objective is to reduce the number of original variables while retaining as much information as possible.

The newly derived variables, known as principal components, are denoted as Y_1, Y_2, \dots, Y_p , where p represents the number of observed variables X_1, X_2, \dots, X_p . These principal components are linear combinations of the original variables, ensuring their independence. Each principal component can be expressed as a weighted sum of the original variables X_1, X_2, \dots, X_p , with weights a_{ij} determining their contribution.

$$\begin{aligned} Y_1 &= a_{11}X_1 + a_{12}X_2 + \dots + a_{1p}X_p \\ &\dots \\ Y_p &= a_{p1}X_1 + a_{p2}X_2 + \dots + a_{pp}X_p \end{aligned} \tag{1}$$

To calculate the weights a_{ij} , it is necessary to compute the characteristic equation $\det(S - \lambda \cdot I) = 0$, where S is the covariance matrix, λ represents the eigenvalues of the polynomial equation of order p and I is the identity matrix. By solving the characteristic equation, we obtain the eigenvalues λ_i , which are then used to calculate the eigenvector a_i , containing the weights a_{ij} (Vojtková, Stankovičová, 2020).

A detailed overview of the principal component method, including criteria for selecting the number of principal components, rotation techniques, result interpretation,

and visualization, is provided by Jolliffe (2002). He also demonstrates the use of PCA in combination with other methods, highlighting its wide-ranging applications in statistical analysis.

The principal component method can be used to reduce dimensionality or to obtain uncorrelated variables before applying further analyses, such as cluster analysis.

3.2. Cluster Analysis

Cluster analysis is a set of mathematical and statistical methods used to divide a set of objects $X_i (i = 1, 2, \dots, n)$ into several unspecified groups (clusters) $C_1, C_2, \dots, C_q (2 \leq q \leq n)$ in such a way that objects within the same cluster are as similar as possible, while objects from different clusters are as dissimilar as possible. Cluster analysis can be performed using various clustering procedures and methods (Vojtková, Stankovičová, 2020).

To assess the similarity between objects, we used distance measures that satisfy the properties of positivity, symmetry, and the triangle inequality. The most used measures include Euclidean distance, city block distance, Minkowski distance, Canberra distance, and others, along with their calculation formulas, as presented by Everitt et al. (2011).

In our analysis, we used Euclidean distance, which assumes the uncorrelated nature of input variables and is calculated as follows:

$$d_{ij} = \sqrt{\sum_{k=1}^n (X_{ik} - X_{jk})^2} \quad (2)$$

where

X_{ik} is the value of the k -th variable for the i -th object,

X_{jk} is the value of the k -th variable for the j -th object.

Clustering procedures are iterative processes used to form clusters of objects and can be either hierarchical or non-hierarchical. Hierarchical methods that start with each element as a separate cluster are called agglomerative, while those that begin with one large cluster and gradually divide into smaller ones are called divisive. Hierarchical methods do not require the number of clusters to be known at the beginning of the analysis and can be visually represented using a dendrogram.

Hierarchical clustering methods include the nearest neighbor method, the farthest neighbor method, the average linkage method, the centroid method, the median method, and Ward's method. Non-hierarchical methods, on the other hand, require the number of clusters to be specified at the beginning of the analysis. Examples of non-hierarchical methods include the method of typical points and the k-means method (Vojtková, Stankovičová, 2020).

In our application of cluster analysis, we used Ward's method:

$$ESS = \sum_{i=1}^{n_h} \sum_{h=1}^q (X_{hi} - \bar{X}_{C_h})^2 \quad (3)$$

where

n_h - number of objects in cluster C'_h ,

\bar{X}_{C_h} - vector of mean values of the variable in cluster C'_h ,

X_{hi} - vector of variable values for the i -th object in cluster C_h .

Selecting the optimal number of clusters is a key step in cluster analysis. Everitt et al. (2011) emphasize that there is no universally correct solution and recommend combining multiple metrics with visual methods such as a dendrogram. The authors mention formal techniques designed to eliminate the issue of subjectivity, such as GAP-statistics.

Vojtková and Stankovičová (2020) present various characteristics for determining the number of clusters, such as the coefficient of determination, semi-partial coefficient of determination, and the cubic clustering criterion, which provide objective criteria for decision-making.

4. Results and discussion

In this section, we focus on the results of the segmentation of Slovak households based on consumer expenditures in 2021 and 2022.

Most of the input variables do not meet the assumption of independence required for entry into cluster analysis. Therefore, before applying cluster analysis, we used the principal component method to create independent variables – principal components and proceeded with them in the clustering process. As input for cluster analysis, we used 7 principal components for the year 2021 and 5 principal components for the year 2022.

The segmentation revealed six main household groups in both years, differing not only in their level of expenditures but also in household composition and income characteristics. Each segment was analyzed in detail regarding average expenditures across various categories, as well as household structure. In both years, we identified four similar and two distinct household groups.

The selection of the number of household clusters in cluster analysis can be based on the dendrogram (Figure 1), as well as the interpretability of the results and the balance of the formed clusters. When determining the number of clusters, we considered four to six clusters. However, for better interpretability and a more even distribution of clusters, we decided to use six clusters for both 2021 and 2022.

Tables 1 (2021) and 2 (2022) present the number of households and the average household expenditures per person per year in each cluster, supplemented by the average net household income per person per year. The average income and expenditures are given in absolute values. When comparing the average levels of individual expenditures across clusters, the lowest values are highlighted in green, while the highest values are highlighted in red (this color coding is used in all tables).

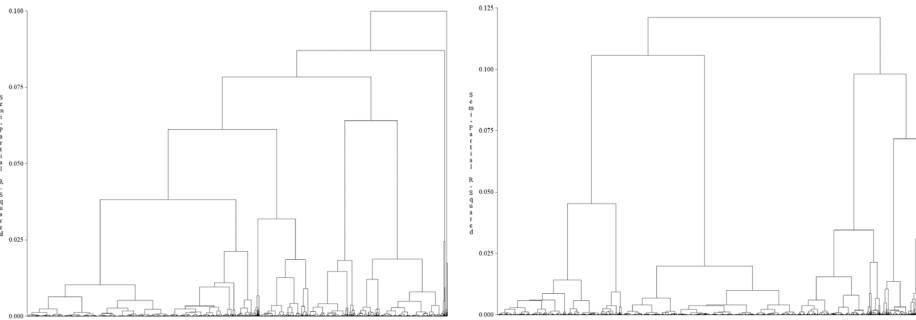


Figure 1. Dendrogram of household clustering based on expenditures using Ward's method (left: year 2021, right: year 2022)

Source: Household Budget Survey, own processing in SAS EG.

Based on Slovak households' expenditures in 2021 and 2022, we identified four segments that appeared in both years. These segments reflect stable consumption patterns across the analyzed years. Additionally, we observed two segments specific to 2021 and two other segments that emerged only in 2022. This difference indicates changes in consumer behavior, which may be influenced by various economic, social, or other factors specific to each year.

Table 1. Average consumer expenditures and average net household incomes in individual clusters (per year and per person) – year 2021

Cluster	Number of households	Net household income	Average consumer expenditures (per year and per person)					
			FAB	ABT	CLO	HSG	FUR	HLT
1	1266	11932.59	2058.33	158.64	172.56	1501.55	354.33	327.79
2	452	11915.67	1878.81	854.33	305.48	1467.51	368.49	166.12
3	1778	9183.92	1276.04	128.90	227.21	1506.91	270.11	217.65
4	1067	12888.79	1435.33	151.59	427.94	1823.19	551.61	211.80
5	44	14238.31	2093.93	295.46	397.54	1689.27	2108.62	366.42
6	26	11505.02	1428.31	176.97	332.38	1285.72	757.30	264.13

Cluster	Number of households	Average total consumer expenditures	Average consumer expenditures (per year and per person)					
			TRA	COM	CUL	EDU	RES	MGs
1	1266	6770.78	436.25	448.38	294.24	6.15	265.40	747.15
2	452	7497.08	544.18	444.28	369.95	8.88	400.65	688.39
3	1778	4785.46	222.05	273.33	175.56	2.38	164.29	321.03
4	1067	8382.81	927.52	478.70	464.61	43.18	881.65	985.69
5	44	23774.56	14251.76	402.56	453.44	3.66	547.84	1164.06
6	26	9700.24	1402.74	456.36	646.59	1208.70	847.47	893.57

Source: Household Budget Survey, own processing in SAS EG.

The interpretation of household segments based on Tables 1 and 2 is supplemented with demographic characteristics – household type and age of household members, whose relative structure in individual clusters is provided in the Appendix in Tables 5 to 12.

Table 2. Average consumer expenditures and average net household incomes in individual clusters (per year and per person) – year 2022

Cluster	Number of households	Net household income	Average consumer expenditures (per year and per person)					
			FAB	ABT	CLO	HSG	FUR	HLT
1	1253	13300.27	1544.09	138.66	423.51	1928.00	468.06	211.14
2	1137	11762.92	2558.02	590.36	259.68	2171.00	420.43	180.33
3	2260	10130.58	1684.33	112.12	183.85	1902.24	291.88	214.49
4	257	12685.36	2795.33	218.91	386.27	2772.23	993.14	943.11
5	67	14012.74	2565.76	251.98	755.57	1948.49	2837.26	332.84
6	17	12946.29	1533.19	207.33	401.95	1550.55	400.69	205.44

Cluster	Number of households	Average total consumer expenditures	Average consumer expenditures (per year and per person)					
			TRA	COM	CUL	EDU	TRA	MGS
1	1253	8910.00	956.02	550.96	498.38	37.06	1003.41	1150.72
2	1137	8680.61	587.59	516.98	300.53	5.89	327.70	762.10
3	2260	5767.30	327.35	325.52	177.59	1.99	148.50	397.42
4	257	11588.77	847.72	495.79	651.07	5.83	427.92	1051.45
5	67	24352.21	12164.86	477.65	617.16	13.07	926.38	1461.20
6	17	10726.67	1322.28	607.43	601.95	1982.37	942.62	970.87

Source: Household Budget Survey, own processing in SAS EG.

Four segments consistent in both 2021 and 2022:

1) Households with an Unhealthy Lifestyle

Households in the second cluster allocate the highest average expenditures on alcoholic beverages, tobacco, and narcotics compared to households in other clusters. These households also have higher-than-average expenditures on food and non-alcoholic beverages, while their health-related expenditures are the lowest on average. In 2021, this cluster comprised 9.76% of households, whereas in 2022, it accounted for 22.78% of households. This cluster is predominantly made up of two-member households, primarily consisting of individuals aged 25 to 64 years.

2) Low-Income Households

The values of nearly all average expenditures in households belonging to cluster number 3 are the lowest compared to other clusters, reflecting their low household income. The average annual net income per person in these households was €9,183.92 in 2021 and €10,130.58 in 2022, making them the households with the

lowest average net income among all clusters. In 2021, this cluster represented 38.38% of households, while in 2022, it grew to 45.28%, making it the largest cluster in both years. This cluster includes one-member and two-member households, primarily consisting of individuals aged 64 and older.

3) High-Income Households

Households in the fifth cluster allocate the highest average expenditures on food and non-alcoholic beverages, household furnishing, transportation, and miscellaneous goods and services compared to other clusters. Their expenditures on other categories are also relatively high. These households spend an exceptionally large amount on transportation, averaging €14,251.76 per person per year in 2021 and €12,164.86 per person per year in 2022. The extremely high transportation costs in these households are due to the purchase of a new motor vehicle. The average annual net income per person in this cluster was €14,238.31 in 2021 and €14,012.74 in 2022, making it the highest among all clusters. Less than 1% of households belonged to this cluster in 2021, increasing to 1.34% in 2022. This cluster predominantly consists of two-member households with individuals aged 25 to 64 but also includes households with dependent children.

4) Households with Children And Students

Households in the sixth cluster allocate the highest average expenditures on education compared to other clusters. They also have higher-than-average spending on recreation and culture, as well as on restaurants and hotels. Conversely, among all clusters, these households spend the least on essential needs – food and housing. Only 0.56% of households belonged to this cluster in 2021, decreasing to 0.34% in 2022. This cluster is predominantly composed of households with dependent children, with children represented across all age groups, and students aged 16 to 24 being the most prevalent.

Two distinct household groups in 2021:

1) Frugal Households (in Terms of Consumer Goods)

Households in the first cluster allocate the highest average expenditures on food and non-alcoholic beverages compared to other clusters, while spending the least on clothing and footwear. A total of 1 266 households were assigned to this cluster, representing 27.33% of all households in the sample. This cluster is predominantly composed of one- and two-member households with individuals over the age of 25, as well as households with dependent children aged 16 to 24.

2) Active Households

Households in the fourth cluster spend the most on clothing and footwear, housing and utilities, postal and telecommunication services, and restaurants and hotels compared to other clusters. Conversely, they allocate less money to food, non-alcoholic beverages, and alcoholic beverages. A total of 1,067 households were

assigned to this cluster, making up 23.03% of all households in the sample. This cluster mainly consists of households with dependent children of all age groups and two-member households.

Two distinct household groups in 2022:

1) Young Households

Households in the first cluster spend significantly less on food and non-alcoholic beverages, as well as on alcoholic beverages, tobacco, and narcotics compared to other clusters. However, they allocate the highest expenditures on restaurants and hotels.

A total of 1,253 households were assigned to this cluster, representing 25.11% of all households in the sample. This cluster is predominantly composed of two-member households with members aged 25–64 and households with dependent children.

2) Childless Households

Households in the fourth cluster spend the most on food and non-alcoholic beverages, housing and utilities, healthcare, and recreation and culture compared to other clusters. However, they invest minimally in education. A total of 257 households were assigned to this cluster, making up 5.15% of all households in the sample. This cluster primarily consists of one- and two-member households, with members predominantly aged 25 to 64.

Table 3. Average consumer expenditures of households in individual clusters (in % per year and per person) – year 2021

Cluster	Number of households	Average consumer expenditures (in % per year and per person)					
		FAB	ABT	CLO	HSG	FUR	HLT
1	1266	30.5	2.4	2.5	22.3	5.2	4.8
2	452	25.1	11.4	4.1	19.6	4.9	2.2
3	1778	26.7	2.7	4.8	31.5	5.7	4.5
4	1067	17.1	1.8	5.1	21.7	6.6	2.5
5	44	8.8	1.2	1.7	7.1	8.9	1.5
6	26	14.7	1.8	3.4	13.3	7.8	2.7

Cluster	Number of households	Average consumer expenditures (in % per year and per person)					
		TRA	COM	CUL	EDU	RES	MGS
1	1266	6.4	6.6	4.3	0.1	3.9	11.0
2	452	7.3	5.9	4.9	0.1	5.3	9.2
3	1778	4.6	5.7	3.7	0.0	3.4	6.7
4	1067	11.1	5.7	5.5	0.5	10.5	11.9
5	44	59.9	1.7	1.9	0.0	2.4	4.9
6	26	14.5	4.7	6.7	12.5	8.7	9.2

Source: Household Budget Survey, own processing in SAS EG.

Considering expenditures on food and non-alcoholic beverages and housing and housing-related energy as essential human needs, households in clusters one, two, three, and four on average spent up to half of their resources on these essential needs. As a result, they had a limited budget for less essential items. If we exclude the extraordinary transportation expenses in the fifth cluster, which accounted for nearly 60% of average annual expenditures in 2021 and 50% in 2022, the expenditures on essential needs in this cluster would still represent a high portion of the budget, around 40%. The most evenly distributed expenditure structure is observed in households in the sixth cluster, where households spend "only" 28% of their resources on essential needs, with a higher portion spent on transportation and education (Tables 3 and 4).

Piekut and Knapkova (2025) analyzed the consumption behavior of households in Europe and, based on various classification methods, grouped countries according to the similarity of their consumer patterns. The study mentions Slovakia as a country that, according to the classification methods used, is grouped with countries exhibiting Western European consumer behavior, even though it is typically considered an Eastern European country. This suggests a shift in the consumer patterns of Slovak households closer to those of Western Europe.

Table 4. Average consumer expenditures of households in individual clusters (in % per year and per person) – year 2022

Cluster	Number of households	Average consumer expenditures (in % per year and per person)					
		FAB	ABT	CLO	HSG	FUR	HLT
1	1253	17.3	1.6	4.8	21.5	5.3	2.4
2	1137	29.5	6.7	3.0	25.0	4.7	2.1
3	2260	29.2	1.9	3.2	33.0	5.1	3.7
4	257	24.1	1.9	3.3	23.9	8.6	8.1
5	67	10.5	1.0	3.1	8.0	11.6	1.4
6	17	14.3	1.9	3.7	14.5	3.7	1.9
Cluster	Number of households	Average consumer expenditures (in % per year and per person)					
		TRA	COM	CUL	EDU	RES	MGS
1	1253	10.7	6.2	5.6	0.4	11.3	12.9
2	1137	6.8	6.0	3.5	0.1	3.8	8.8
3	2260	5.7	5.6	3.1	0.0	2.6	6.9
4	257	7.3	4.3	5.6	0.1	3.7	9.1
5	67	50.0	2.0	2.5	0.1	3.8	6.0
6	17	12.3	5.7	5.6	18.5	8.8	9.1

Source: Household Budget Survey, own processing in SAS EG.

However, on the other hand, although Slovakia shows similar consumer patterns to Western countries, challenges related to income disparity and living standards, which are characteristic of Eastern European countries, persist. The results of this study show that, although consumer patterns are starting to align, significant differences in the consumption of basic goods and services still exist between Eastern and Western European countries.

Morvay (2023) emphasizes the need for state support for households threatened by poverty or economic shocks. This perspective is undoubtedly justified, but the analysis of household consumption behavior suggests that the approach to social and economic policies should be more targeted. The results of our analysis show that even within the group of low-income households (cluster 3), there may be households where average income exceeds expenditures. This group is characterized by a consumption structure primarily focused on food and housing, yet they are still able to save. This suggests that not all low-income households necessarily need state support to the same extent.

On the other hand, in the case of high-income households (cluster 5), it can be observed that their average expenditures exceed their income. However, this trend is not necessarily a sign of financial instability but is influenced by one-time investments, such as the purchase of a car. This is a small proportion of households, which likely recurs at different times, but there is no reason to consider it a vulnerable group.

These findings suggest that for economic policy to be effective, it should not be solely based on income categories but should also consider expenditure patterns and household structures. Otherwise, there is a risk that support may be directed to households that do not actually need it, while some truly vulnerable groups may remain outside its reach.

State aid should be differentiated not only based on income but also on household expenditure patterns, as some low-income households are able to save, while high-income households may draw on their savings. Support should focus on essential expenditures, such as housing and food, for example, in the form of tax relief or energy subsidies. It is important to encourage households to engage in responsible financial behavior, such as promoting savings. The state should regularly analyze the effectiveness of assistance and adjust it to the specific types of households, as their needs vary – seniors are at risk from rising energy prices, while families with children face higher costs for care and education.

5. Conclusions

The results of the analysis of household consumption expenditures in Slovakia for 2021 and 2022 led to the identification of six household segments, four of which remained the same in both analyzed years, while two changed depending on the period.

The obtained segments reflect not only differences in household income levels but also their consumption behavior and spending preferences.

The selected combination of the years 2021 and 2022 made it possible to observe the stabilization of consumer behavior after the most critical phase of the pandemic, while these years provide a relevant framework for analyzing household behavior in the context of an ongoing but stabilized crisis. The year 2023 already reflects new structural challenges (e.g. inflation, energy crisis, geopolitical tensions), which will be the subject of further research.

The four stable segments of households in the analyzed years are households with an unhealthy lifestyle, low-income households, high-income households, and households with children and students. Households with an unhealthy lifestyle are characterized by a preference for spending on addictive substances at the expense of investing in health. Low-income households are characterized by the lowest level of consumption expenditures in almost all categories, and nearly half of the households in the analyzed sample fall into this category, highlighting the high proportion of the population with limited financial resources. High-income households are characterized by the highest expenditures on new household equipment and the purchase of transportation means. This group reflects higher purchasing power and a focus on investments in long-term assets. The consumption pattern of households with children and students highlights the importance of education and leisure activities.

For 2021, specific segments include frugal households, which are characterized by prudence in managing finances, and a preference for home-cooked meals over eating out, as well as active households focused on socialization and an active social lifestyle. For 2022, specific segments include young households, whose typical characteristic is a preference for eating out, reflecting the lifestyle change among young people who prioritize convenience and quick access to food, and childless households, whose consumption pattern indicates a focus on personal comfort, quality housing, and health care.

The analysis confirmed that regardless of income level, Slovak households spend about half of their total expenditures on essential needs, primarily food and housing. However, the absolute amount of these expenditures differs depending on income groups. Households with higher incomes have higher consumption in areas such as recreation, culture, dining at restaurants, hotels, transportation, and clothing, while low-income households primarily focus on covering basic needs. These results highlight significant differentiation in consumption behavior among various household segments and confirm that income level is one of the key factors influencing consumption patterns. Segmenting households based on expenditures provides a useful insight into the economic behavior of different population groups and can serve as an important tool for the development of socio-economic strategies and policies to support different income groups.

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Appendix

Table 5 Distribution of households by household type in individual clusters in % – year 2021

Cluster	Number of households	Household type					
		1	2	3	4	5	6
		1 adult	2 adults	More than 2 adults	1 adult with dependent children	2 adults with dependent children	More than 2 adults with dependent children
1	1266	24.6	34.7	12.2	2.5	18.2	7.8
2	452	19.5	45.6	10.6	2.0	15.9	6.4
3	1778	33.6	38.9	10.1	1.0	9.1	7.3
4	1067	21.7	26.3	10.0	5.9	28.2	7.9
5	44	11.4	61.4	2.3	2.3	18.2	4.4
6	26	11.5	11.5	3.9	23.1	42.3	7.7

Source: Household Budget Survey, own processing in SAS EG.

Table 6 Household structure by number of members aged 16 to 24 in % (2021)

Cluster	Number of households	Number of members aged 16 to 24					
		0	1	2	3	4	5
1	1266	81.9	12.4	4.8	0.7	0.0	0.2
2	452	83.6	14.4	1.3	0.4	0.0	0.2
3	1778	87.9	7.9	3.3	0.8	0.1	0.0
4	1067	76.9	18.1	4.5	0.5	0.0	0.1
5	44	90.9	9.1	0.0	0.0	0.0	0.0
6	26	61.5	34.6	3.8	0.0	0.0	0.0

Source: Household Budget Survey, own processing in SAS EG.

Table 7 Household structure by number of members aged 25 to 64 in % (2021)

Cluster	Number of households	Number of members aged 25 to 64						
		0	1	2	3	4	5	6
1	1266	25.1	28.4	37.9	6.8	1.4	0.3	0.1
2	452	19.5	25.2	46.0	7.3	2.0	0.0	0.0
3	1778	46.3	24.2	23.1	4.7	1.5	0.2	0.1
4	1067	10.2	29.6	49.8	8.0	2.3	0.1	0.0
5	44	18.2	20.5	56.8	4.5	0.0	0.0	0.0
6	26	0.0	34.6	61.5	3.8	0.0	0.0	0.0

Source: Household Budget Survey, own processing in SAS EG.

Table 8. Household structure by number of members aged over 64 in % (2021)

Cluster	Number of households	Number of members aged over 64			
		0	1	2	3
1	1266	58.1	24.7	16.9	0.2
2	452	69.7	16.8	13.5	0.0
3	1778	32.5	42.0	25.4	0.1
4	1067	80.4	14.0	5.6	0.0
5	44	70.5	18.2	11.4	0.0
6	26	92.3	3.8	3.8	0.0

Source: Household Budget Survey, own processing in SAS EG.

Table 9. Distribution of households by household type in individual clusters in % – year 2022

Cluster	Number of households	Household type					
		1	2	3	1	5	6
		1 adult	2 adults	More than 2 adults	1 adult with dependent children	2 adults with dependent children	More than 2 adults with dependent children
1	1253	19.4	26.5	9.7	6.6	29.5	8.3
2	1137	25.9	40.7	9.1	2.4	15.7	6.2
3	2260	35.3	38.1	9.9	1.6	9.9	5.2
4	257	35.4	46.7	5.8	0.8	10.1	1.2
5	67	13.4	53.7	3.0	1.5	23.9	4.5
6	17	11.7	5.9	5.9	11.8	52.9	11.8

Source: Household Budget Survey, own processing in SAS EG.

Table 10. Household structure by number of members aged 16 to 24 in % (2022)

Cluster	Number of households	Number of members aged 16 to 24					
		0	1	2	3	4	5
1	2260	89.7	6.7	2.8	0.7	0.0	0.0
2	1137	84.8	11.7	2.7	0.5	0.0	0.3
3	1253	73.7	20.2	5.4	0.6	0.0	0.0
4	257	93.8	5.8	0.4	0.0	0.0	0.0
5	67	85.1	13.4	1.5	0.0	0.0	0.0
6	17	52.9	35.3	11.8	0.0	0.0	0.0

Source: Household Budget Survey, own processing in SAS EG.

Table 11. Household structure by number of members aged 25 to 64 (2022) in %

Cluster	Number of households	Number of members aged 25 to 64						
		0	1	2	3	4	5	6
1	2260	48.0	25.3	21.6	3.8	0.9	0.2	0.0
2	1137	25.3	29.3	38.2	5.7	1.3	0.1	0.1
3	1253	8.1	29.1	54.0	6.9	1.8	0.1	0.0
4	257	39.3	26.8	30.0	3.9	0.0	0.0	0.0
5	67	14.9	16.4	64.2	4.5	0.0	0.0	0.0
6	17	0.0	23.5	70.6	5.9	0.0	0.0	0.0

Source: Household Budget Survey, own processing in SAS EG.

Table 12. Household structure by number of members aged over 64 (2022) in %

Cluster	Number of households	Number of members aged over 64			
		0	1	2	3
1	2260	32.5	41.5	25.8	0.1
2	1137	61.7	22.0	16.1	0.2
3	1253	81.2	14.0	4.8	0.0
4	257	50.2	28.4	20.6	0.8
5	67	76.1	16.4	7.5	0.0
6	17	94.1	5.9	0.0	0.0

Source: Household Budget Survey, own processing in SAS EG.