

FEATURES OF THE TRANSFORMATION OF THE REGIONAL MODELS OF THE HOUSEHOLDS' FINANCIAL BEHAVIOR

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Abstract

The article is devoted to identifying the features of the transformation of the regional models of the households' financial behavior. An algorithm and a method for determining the level of the households' financial behavior transformation are proposed. Based on this methodology, the authors made calculations that allowed to group the regions according to the level of the households' financial behavior transformation. As a result, four groups of regions have been identified: with a high level of the households' financial behavior transformation, with a level above average, with a medium and low level of the households' financial behavior transformation. Features of each group of regions are described. The increase in the impact of digitalization on the financial behavior of households as a result of the COVID-19 pandemic has been demonstrated.

Keywords: *digitalization, financial behavior, household, the level of the households' financial behavior transformation, regional models of financial behavior, transformation.*

JEL Codes: *D1, G4.*

Introduction

Today, households and their financial resources significantly affect the level of economic growth, financial market stability, as evidenced by the practice of foreign economically developed countries. They should be considered the main source of investment in the real sector of the economy. The growing role of household finances is greatly facilitated by modern domestic conditions, in which companies and enterprises suffer not only from a shortage of investment resources, but also financial, which they need to ensure the proper

functioning of operating activities. This is due to the instability of the world economic system and domestic imperfections in the legal and organizational aspects, which negatively affects the attraction of foreign investment in the country. In addition, the current conditions of digitalization are making adjustments to the financial processes of households. Digitalization, as one of the leading areas of human development, contributes to expanding access to banking and the financial sector. The coronavirus pandemic has highlighted the need for and

importance of digital technologies for economic development and quality of life.

The purpose of this article is to identify the features of the households' financial behavior transformation in the regional context.

Literature review

Features of the transformation of financial behavior of households, including in the regional aspect revealed in the scientific works of the following leading scientists: Agarwal S. et al. (2011); Bernasek A. (2002); Dinga E. et al. (2011); Doya K. (2008); Fatykhov A.I. (2011); Fedyshyn M.F. et al. (2019); Fonseca R. et al. (2012); Friedberg L. et al. (2006); Iefremenko T. (2002); Jureviciene D. et al. (2012); Kizyma T.O. (2011); Kosach I.A. et al. (2019); Kübilay B. et al. (2016); Lakshmi P. et al. (2013); Leonov V.V. (2007); Lodhi S. (2014); Lusardi A. (2009, 2014); Prokopenko V. et al. (2018); Sarwar A. et al. (2014); Shkarlet S. et al. (2018) and others.

Research on the financial behavior of households is interdisciplinary, due to the presence of a significant array of publications of scientists in various fields of science. Researchers Jureviciene and Krisitina (2012) analyze the aspects of psychological nature that determine financial behavior, including needs, desires, uncertainty, risk and more; identify psychological bias as the dominant factor in investors' financial decisions. Kübilay and Bayrakdaroglu (2016) studied a set of different institutional factors that affect the development of financial relations in the country, namely: individual qualities, tolerance, historical features of the financial market, the attitude of individual investors to risk. Lakshmi (2013) also analyzed the peculiarities of the formation of financial behavior of households, considered the following factors that determine the creation of its model: risk attitude, cognitive dissonance, the presence of prerequisites for the formation of herd behavior among the population in dissipative processes that periodically occur within financial system.

Research by sociologists (Iefremenko, 2002, Leonov, 2007, Fatykhov, 2011, etc.) reveals financial behavior through the prism of social norms and the behavior of the most common social groups. Also in the study of these authors, special attention is paid to the study of the impact of demographic transformations on the formation of financial behavior of households, how changes in population structure can determine changes in household behavior in the financial market. Lodhi (2014), for example, conducted a thorough study of different patterns of financial behavior and found that older people are less likely to make riskier financial transactions. Lusardi (2009-2014), (Fonseca et al., 2012; Freidberg & Webb, 2006; Bernasek & Bajtelsmit, 2002) conducted research on the impact of financial literacy on the formation of the optimal model of financial behavior of households. Friedberg & Webb (2006) found that in the vast majority of households, men make decisions about the use of financial resources and thus play a key role in shaping the financial behavior of households.

Taking into account the research of economists (Dinga et al., 2011; Agarwal et al., 2011; Lusardi, 2014) it can be argued that financial behavior is determined by the level of financial literacy and financial experience. Kizima (2011) argues that the financial behavior of households should include the activities of households, which result in the processes of distribution and redistribution of financial resources and the formation of appropriate funds for such resources.

The considered scientific positions of leading scientists are important for studying the financial behavior of households, but the question of the peculiarities of the transformation of different types of regional models of financial behavior of households requires in-depth scientific study and analysis.

Methodical approach

In order to achieve this goal, the list of indicators for the calculation of a comprehensive index of financial behavior of

households was substantiated and the level of FBH transformation was calculated.

The following methods were used to obtain results:

- statistical, which were used to form indicators for calculating the components of the level of the households' financial behavior transformation;

- a special case of multidimensional analysis, which was used to assess the level of the households' financial behavior transformation based on the calculation of a comprehensive index of financial behavior of households, for which matrices of initial data were formed;

- cartographic, which contributes to the visual representation of the grouping of regions by the level of the households' financial behavior transformation.

The authors propose a methodological approach to determining the level of the households' financial behavior transformations, which includes the following stages:

- 1) identification of research objects for which the level of the households' financial behavior transformation is calculated;

- 2) formation of a set of indicators to assess the transformation of the level of the households' financial behavior;

- 3) determination of a comprehensive index of the households' financial behavior and the level of the households' financial behavior transformation;

- 4) identification of criteria for grouping regions according to the level of the households' financial behavior transformation;

- 5) determination of regional features according to the level of FBH transformation in relation to each group of regions and formation on this basis of different types of regional households' financial behavior models.

Thus, using the above algorithm, we determine that the objects of study will be all regions of Ukraine, except the Autonomous

Republic of Crimea and Sevastopol city due to lack of statistical information, as well as due to the specific presentation of certain statistics to be used in calculations, Kyivska region and Kiev city will act as one object of study.

The comprehensive index of the households' financial behavior is calculated using such indicators as: loans per household, million USD; consumer loans per household, USD; the share of consumer credit in the total amount of credit; loans for the purchase, construction and reconstruction of real estate per household, USD; the share of loans for the purchase, construction and reconstruction of real estate in the total amount of the loan; other loans per household, USD; the share of other loans in the total amount of the loan, mortgage loans from the total amount of loans per household, USD; loans to households for the purchase, construction and reconstruction of real estate, up to 1 year, per household, million USD; share of loans up to 1 year; loans from 1 year to 5 years per household, USD.; share of loans from 1 year to 5 years; loans for more than 5 years per household, USD; share of loans over 5 years; deposits per household, USD (Verner I., 2020).

Since the above indicators have different units of measurement, for further calculations we standardize them according to the following formula:

$$Z_{ij} = \frac{K_{ij} - \bar{K}_j}{S_j}, \quad (1)$$

where $\bar{K}_j = \frac{1}{m} \sum_{i=1}^m K_{ij}$ – average for the j-th indicator of the industry under investigation;

$S_j = \sqrt{\frac{1}{m} \sum_{i=1}^m (K_{ij} - \bar{K}_j)^2}$ – average quadratic deviation of the j-th indicator of the industry.

For further calculations, we use the following algorithm (Table 1).

Table 1. Algorithm for settlements of the generalized index of the households' financial behavior

Stage	Formula for calculations
Calculation of the reference point. To determine the reference point of a multidimensional space, which is a vector, we apply the following rule: among all indicators-stimulants we choose the maximum, among the indicators-determinants - the minimum	$P_o = \text{where } z_{ok} = \max z_{ik}, \text{ if } k \in I_1,$ $P_o = \text{where } z_{ok} = \min z_{ik}, \text{ if } k \in I_2$
Implementation of quantitative evaluation. Calculation of the distance between the j-th object and the point (P _o)	$C_{oi} = \left[\sum_{k=1}^n (Z_{ik} - Z_{ok})^2 \right]^{\frac{1}{2}}$
Determining the average distance between a j-th object and a point (P _o)	$\bar{C}_{io} = \frac{1}{m} \sum_{i=1}^m C_{io}$
Calculation of the average quadratical deviation	$S_o = \left[\frac{1}{m} \sum_{k=1}^m (C_{io} - \bar{C}_o)^2 \right]^{\frac{1}{2}}$
Determination of magnitude C _o	$C_o = \bar{C}_{io} + 2 \cdot S_o$
Calculation of the indicator y ₁	$y_1 = 1 - \frac{C_{io}}{C_o}$

Results

The participation of households in the financial and economic system is characterized by both the potential of their financial resources aimed at meeting their needs and the ability to implement it. It is the characteristic features of the process of formation, distribution and application of this potential, taking into account the manifestation of a number of factors that determines the actions of the population in the financial services market regarding redistribution and investment of funds. Thus, increasing the level of importance of the population's finances determines the formation of their financial potential, choosing the optimal model and developing a strategy of the households' financial behavior as a factor that significantly affects the development of the economic system as a whole and the individual in particular. The process of forming a model and strategy of financial behavior is influenced by a number of leading factors, such as: the level of economic and political stability in the country; the degree of trust in the state in general and its financial system in particular;

development of the financial market and its infrastructure; economic, financial and digital literacy; the state of the right system; socio-cultural factors, etc.

At the same time, the basis of financial activity are the processes of preservation of investment, lending, consumption, which determine certain patterns of behavior. An important point is to promote financial activity to reduce the level of indebtedness of the population through its repayment with funds released from current consumption, rather than increasing loans and borrowings and the use of storage and property for current consumption, in other words financial efficiency, not vice versa. Digitalization of the financial sector is aimed at access to financial services and various financial transactions, increasing the speed of their implementation.

We carry out calculations on the basis of the offered technique. First, we form a matrix of standardized indicators that characterize the components of a comprehensive index of the households' financial behavior. Next, using the data on the

sequence of calculations of the complex index of the households' financial behavior, contained in Table 1, make further calculations. Table 2 shows the calculations

of the complex index of the households' financial behavior and determines the level of transformation.

Table 2. Dynamics of the comprehensive index of the households' financial behavior and the level of transformation

Region	2016	2017	2018	2019	2020	Transformation of households' financial behavior
Vinnitsia	0.249	0.238	0.239	0.242	0.254	1.020
Volyn	0.261	0.250	0.251	0.272	0.262	1.005
Dnepropetrovsk	0.308	0.293	0.293	0.386	0.302	0.978
Donetsk	0.271	0.258	0.256	0.277	0.263	0.969
Zhytomyr	0.249	0.236	0.239	0.239	0.254	1.019
Transcarpathian	0.257	0.240	0.239	0.231	0.249	0.970
Zaporozhye	0.285	0.273	0.272	0.326	0.280	0.980
Ivano-Frankivsk	0.259	0.247	0.246	0.254	0.258	0.994
Kyiv and Kiev city	0.998	0.951	0.953	0.997	0.999	1.001
Kirovograd	0.243	0.232	0.233	0.224	0.251	1.033
Luhansk	0.247	0.237	0.239	0.236	0.247	1.002
Lviv	0.310	0.301	0.302	0.404	0.301	0.973
Mykolayiv	0.260	0.246	0.249	0.265	0.263	1.011
Odessa	0.312	0.292	0.288	0.354	0.293	0.940
Poltava	0.267	0.256	0.259	0.302	0.272	1.020
Rivne	0.254	0.244	0.244	0.250	0.258	1.015
Sumy	0.251	0.241	0.242	0.252	0.259	1.029
Ternopil	0.253	0.240	0.239	0.229	0.253	1.001
Kharkiv	0.280	0.266	0.268	0.319	0.278	0.994
Kherson	0.261	0.248	0.247	0.259	0.260	0.997
Khmelnysky	0.257	0.245	0.246	0.258	0.259	1.006
Cherkasy	0.258	0.245	0.245	0.253	0.259	1.006
Chernivtsi	0.257	0.244	0.242	0.240	0.251	0.977
Chernihiv	0.245	0.236	0.238	0.238	0.257	1.049

Based on the obtained results (Table 2), we propose to distinguish four groups of regions: with a high level of the households' financial behavior transformation, with a level

above average, with a medium and low level of the households' financial behavior transformation (Fig. 1).



Figure 1. Grouping of Ukraine’s regions by the level of the households’ financial behavior transformation, 2020

Thus, the group of regions with a high level of the households’ financial behavior transformation includes such regions as Kirovohrad, Sumy and Chernihiv, among which the highest level of the households’ financial behavior transformation (1.049) is in Chernihiv region. The oblasts of this group have the highest results compared to the average in Ukraine, which indicates that these regions have undergone the greatest positive changes over the past 5 years.

The next group of regions (Vinnytsia, Volyn, Zhytomyr, Kyiv and Kiev city, Luhansk, Mykolaiv, Poltava, Rivne, Ternopil, Khmelnytsky, Cherkasy) have slightly higher than or equal to the average value in Ukraine, which allowed to include them in the group with a level of transformation above average and indicates the presence of positive changes during the study period.

The average level of the households’ financial behavior transformation includes such regions as Zaporizhia, Ivano-Frankivsk, Kharkiv, Kherson and Chernivtsi, their indicators are lower than the average in

Ukraine, which is due to a slight deterioration in 2020 compared to 2016.

The fourth group (with a low level of the households’ financial behavior transformation) includes oblasts (Dnipropetrovsk, Donetsk, Zakarpattia, Lviv, Odesa) with indicators that are the lowest when compared to the average in Ukraine, due to their decrease in 2020 compared to 2016.

Conclusions

Thus, the article clarifies the features of the transformation of the regional models of the households’ financial behavior on the basis of the algorithm developed by the authors and the proposed methodology. The advantages of this method include: no restrictions on the quantitative composition of indicators and objects of study; based on a multidimensional approach; evaluation is carried out on the basis of statistical indicators that reflect the real course of events and are comparable; if necessary, the set of indicators can be expanded; factors that have different

dimensions and manifestations of influence are taken into account. The calculations performed in the article and the developed algorithm made it possible to group the regions of Ukraine according to the level of the households' financial behavior

transformation and to distinguish four groups of regions according to this indicator.

Further research is needed to study the impact of digitization processes on the the households' financial behavior.

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