

# *The use of digital financial technologies in strategies to optimize the structure of household financial resources*

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**Abstract** — The article presents the results of a study verifying the initial hypothesis that there is a direct effect of the level of financial literacy of the population on the use of digital financial instruments by households. The structure of household transactions by disposing of disposable income in dynamics (2013 and 2019) is shown; the results of a questionnaire analysis of a 1,608 respondents sample assessing the level of financial literacy and a survey on the structure of financial transactions; questions of questionnaires developed by the authors based on the methodology of the CB RF. It is concluded that more financially literate people tend to make greater use of digital financial technologies and services in transactions. The analysis is supplemented by a review of the results of assessing the level of financial literacy in the world's countries, Russia and the Sverdlovsk region.

The purpose of the study is to analyze the influence of financial literacy in the widespread use of digital financial technologies in the formation of strategies for optimizing household resources based on an analysis of the results of a survey of a group of respondents.

**Main results:** the authors substantiated the conclusion about the influence of the population level of financial literacy on the use of digital financial technologies and the formation of a strategy for optimizing household resources.

**Keywords** — digital financial technologies, financial resources of households, financial literacy of the population, financial transactions.

## I. INTRODUCTION

The active use of digital technologies in all economic processes and financial transactions involves wide sectors of the population.: people use digital financial services daily.

Trends in global financial globalization give rise to the development of financial instruments and stimulate the increasing use by people of digital services in everyday transactions. To a large extent, this is due to the convenience of new banking services, their availability with almost no time limits and territorially. However, at the same time as the convenience and speed of such operations increases, a pool of risks associated with their use is formed and increases:

protection of personal data, fraud, cyber-attacks on servers of financial institutions - all of them are relevant even with the ordinary use of bank cards.

One of the fastest-growing segments of digital financial technology, for non-cash transactions - settlements on purchases and money transfers using:

- 1) electronic wallets (Qiwi, Yandex-money, Web money and others);
- 2) electronic services (PayPal; on-line banking and others);
- 3) debit cards (salary transfer, payment for goods and services, card2card transfers);
- 4) credit cards and other services.

The results of the calculations of the authors according to the Federal State Statistics Service (FSSS) are shown in Figures 1 and 2, which show that the Russians began to use non-cash services significantly more (from 45 to 67%).

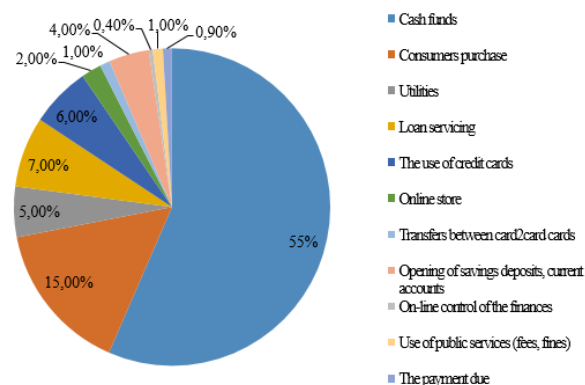


Fig 1. The structure of monetary transactions of the population of the Russian Federation in 2013,%

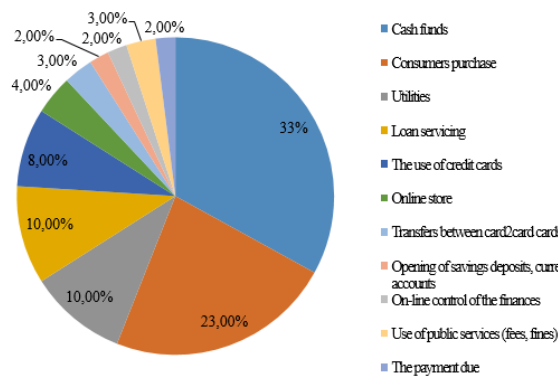


Fig 2. The structure of monetary transactions of the population of the Russian Federation in 2019, %

A noticeable increase in the use of digital financial technologies (most often through electronic gadgets) in the total number of household financial transactions is associated with a slight improvement in assessments of the level of financial literacy of citizens. The authors in their study proceed from the hypothesis that the development of financial services and their active use is associated with the level of financial knowledge of the population about the opportunities and risks associated with their use. In addition, financially literate people tend to self-consciously formulate strategies to optimize the structure of the financial resources of their households.

To implement the National Strategy for financial literacy in Russia, the Ministry of Finance of the Russian Federation is authorized to manage work in this direction; the functions of the supervisory and coordinating department are carried out by the Interdepartmental Project Commission (IPC); Participants of the standing commission, along with the Ministry of Finance, are: The Central Bank, the Ministry of Education and Science, the Ministry of Education, the Ministry of Economic Development and the Consumer Rights Protection Agency of the Russian Federation. The responsibilities of these bodies include overseeing the implementation of the Strategy as a whole and ensuring strategic control; The working group of the Ministry of Finance provides administrative support during the work process.

## II. MATERIALS AND METHODS

The main research method for identifying and analyzing household decisions, traditionally, is surveys, since it is extremely difficult, long, and often not possible, to collect and process statistical information in a narrow direction. So, for example, it is possible to determine the structure of transactions of citizens only according to the data of commercial card-issuing banks, but such data is not subject to disclosure since there is legislation regarding the protection of personal data. In addition, it is possible to collect information about cash transactions only on the basis of voluntarily reported data - statistics are powerless.

To obtain reliable and relevant data of value for scientific research are polls, the methods of which are usually typified according to a number of criteria:

1) by the method of obtaining data:

- contact - interviewing;

- contactless - questionnaire;

2) in the form of:

- oral - by phone, recording on audio devices;
- written - filling out formalized questionnaires;

3) at the venue:

- solid - in crowded places (shopping centers, crowded events, transport hubs, etc.);
- electoral - according to the methods of study, work, residence;

4) in terms of competency:

- mass - continuous polls;
- expert - an audience selected by topic of research;

5) by the method of interaction with respondents

- personal (full-time);
- depersonalized (extramural).

When conducting surveys, a number of rules are observed, which is due to the need to obtain as complete information as possible, if possible - reliable and as objective as possible:

1) Thematic survey. The survey should focus on one topic. The inclusion of several thematic areas in the survey will not allow obtaining objective information: Respondents' answers will be incomplete. Switching from one topic to another will reduce the reliability which is already not quite inherent in this research method.

2) The optimal structure of the questionnaire. The wording of the questions should be brief, understandable, not numerous, suggest a definite answer; the number of questions should be such, the time of interviewing or filling out the questionnaire did not exceed 5 - 7 minutes.

3) The logical design of the questionnaire. The sequence of questions should be arranged in such a way that they are not only related, but also keep the respondent's interest: simple questions should be posted first, then more complex but not confusing ones; at the end - again simple, in order to leave an impression of feasibility, potential surmountability of the task.

4) The target audience of the survey. The right choice of the target audience contributes to the collection of reliable information, since its equal distortion by a knowledgeable (dedicated) audience is hardly possible. Therefore, the sample of respondents must meet certain criteria: demographic, social, cultural and other relevant to the subject of the survey.

The authors conducted a study to assess the level of financial literacy of the population by interviewing students of the Ural Federal University and members of their families by means of full-time and part-time forms. The conduct of such a survey is designed to create a sample of regular participants on the basis of higher education institutions. The main objectives of the survey among students and their environment were:

1) Creation of a permanent sample, since contacts with students are maintained by universities both through formalized

and informal channels - in the first case, these are departments of centers for interaction with employers, in the second, they are dean's employees, teachers, while communicating with group wardens during the training period students, and upon graduation, with graduates through social networks, based on professional interests and personal connections.

2) The uniqueness of using such a channel for conducting regular surveys lies in the fact that it provides information in dynamics that can be used to track changes in the level of financial literacy of people of a certain social group with similar characteristics in terms of education, professional affiliation and others, including - socio-psychological characteristics: consumer preferences, a range of financial decisions, level of property claims, etc. In addition, interaction in this format is able to involve the environment of students and graduates of universities in participating in surveys, that is, expand the base and form a stable audience from different age categories: parents; grandmothers and grandfathers; later, husbands and wives; other relatives can be integrated into research on a regular basis.

The experience of a pilot survey in this format has already brought tangible positive results, which, however, should be evaluated critically precisely in view of the specifics of the sample - these are representatives of a socially prosperous environment who have or are getting higher education - and therefore have great knowledge both in the field of financial literacy and in other areas.

### III. RESULTS

The survey results, presented in Table 1 and Figure 3, characterize the financial literacy of residents of the city of Yekaterinburg obtained through the survey channel of students and graduates of the Ural Federal University and their families

TABLE I. Data on financial literacy of the population of Yekaterinburg by age groups

Groups / Results	Number of people	Task 1	Task 2	Task 3	Task 4	Task 5	Total, %
Pupils	312	3,1	5,8	5,9	5,4	3,8	48
Students of STR	432	4,4	6,1	5,3	4,8	4,9	51
University students	484	5,6	6,2	6,1	4,5	4,6	54
Working	268	5,2	5,5	5,8	4,9	4,6	52
Senior citizens	112	3,2	5,4	4,4	4,2	4,3	43
Total:	1,608	-	-	-	-	-	50, 93

When conducting a preliminary survey, the main objective was, regardless of social and property status, profession, education and place of residence, to obtain primary data on the financial literacy of the population, estimated on the basis of a questionnaire used in OECD countries that was previously adapted for Russian conditions. The results presented in Table 3 reflect the results of a blitz survey conducted in September-November 2018.

The study involved 1,608 people, of which:

- 1) 312 schoolchildren aged 12 to 16;
- 2) 432 college students aged 16 to 20;

- 3) 484 university students aged 19 to 22;
- 4) 268 people aged 26 to 53;
- 5) 112 people aged 56 to 71.

Such characteristics as the average age and ethno-national characteristics of the sample were not determined, since they are not of fundamental importance for the study. Respondents indicated only their age - the number of full years - and occupation - schoolchild, student, senior citizen, etc. The importance of precisely these characteristics of the survey participants is determined by the fact that in the future it is possible to build financial education programs based on target channels - schools, secondary and higher educational institutions, pension funds and social institutions.

The main method of the study was a survey consisting of five tasks. The answers given by respondents were recorded, then evaluated in accordance with a ten-point scale (Table 2).

TABLE II. Questionnaires for assessing financial literacy

Questionnaire questions	Questionnaire questions
1. Imagine that you have some free amount of money, say, 100 thousand rubles. Which in your opinion is less risky: - invest the entire amount in a business? - place the amount in several different assets? - open a full bank deposit? - purchase the full amount of currency?	3. Imagine that you need to take a loan from a commercial bank in the amount of 100 thousand rubles. In which case will you pay the bank a smaller amount? - if you need to return 105 thousand rubles; - if the loan is worth 3% per annum.
2. Let in the next 10 years, the prices of products and goods that you usually buy will double. Do you think that if your income also doubles, you can buy? - less than today; - as much as today; - more than today.	4. Imagine that you put money into the bank for two years, and the bank agrees to add 15% per year to your account. Will the bank pay more in the second year than in the first, or will it pay the same amount of money in both years?
5. Imagine that you have placed 100 thousand rubles on a savings account with a bank at 10% per annum. How much money will be in your account after five years if you do not withdraw money from it? - more than 150 thousand rubles; - exactly 150 thousand rubles; - less than 150 thousand rubles.	

To obtain a positive result, it was necessary to score at least 6 points in each task, that is, the total amount for a positive assessment of the respondent's financial literacy should not be less than 30 points for all five tasks. Estimated: completeness and correctness of answers; reasoned answers; ability to calculate without the aid of auxiliary means, logical orientation in the perception and analysis of task conditions.

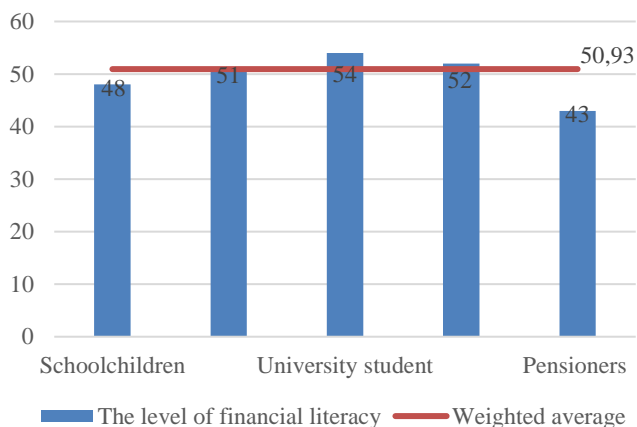


Fig 3. The results of assessing the level of financial literacy by groups of respondents

The points for each of the tasks are calculated as the arithmetic average for each of the samples; the final value also represents the arithmetic average of all five tasks. The value shown by the orange line (Figure 1) is calculated as the weighted average for all groups of respondents in the sample:

$$(312 \times 0.48 + 342 \times 0.51 + 484 \times 0.54 + 268 \times 0.52 + 112 \times 0.43) / 1608 = 50.93\% \approx 51\% (1)$$

Figure 3 shows that, at and slightly above, college students, university students, and the working population are financially literate. Financial literacy is lower than the weighted average among schoolchildren (48%) and among people of retirement age (43%).

#### IV. DISCUSSION

Research interest led to the next stage of assessing the level of financial literacy - to compare the indicators of the Sverdlovsk region with the ratings of the countries participating in the monitoring of financial literacy of the Organization for Economic Cooperation and Development (OECD). In 2013, OECD countries developed the "Framework of Basic Competencies in Financial Literacy for Adults" as a mechanism for implementing the policies of the International Network for Financial Education (IFRS; INFE (International Net Financial Education)). The frame contains methodological and educational materials on the basic knowledge and skills that a modern person should have, interacting with a variety of services in professional activities and everyday life - this frame formed the basis of the questionnaire, which the authors used for the survey. The results of the analysis are presented in Table 2.

The results of the Sverdlovsk Region, as can be seen from Table 3, are significantly higher than in Russia ( $\approx 51\%$  versus  $38\%$ ), which corresponds to the place in the ranking between countries such as the Czech Republic ( $57\%$ ) and Japan ( $43\%$ ). However, the authors consider this result not entirely reliable, since the survey was conducted among respondents from the university environment, who certainly have a slightly higher level of knowledge in all areas of life, including financial literacy, and could help to help their relatives answer questions. In addition, the assessment of the level of financial literacy in the Sverdlovsk region was carried out in 2018, while in other

countries and in the Russian Federation in 2014, which, of course, somewhat distorts the results, since from 2014 to 2018, digital financial technologies and services underwent significant changes and become more accessible to many Russian households.

At the next stage, respondents were offered scenario strategies for disposing of disposable income based on a simple division of strategies into conservative, aggressive and moderate types. The largest and most financially literate group of respondents — university students and working respondents — chose a moderate type of strategy — when it is planned to generate savings for the purpose of investing in affordable financial instruments — from cumulative life insurance to participate in mutual investment funds and concluding agreements for opening individual investment accounts with commercial banks.

TABLE III. PLACE OF RUSSIA AND SVERDLOVSK REGION IN THE INTERNATIONAL FINANCIAL LITERACY RATING

Ranking position	Countries	Financial literacy, %	Ranking position	Countries	Financial literacy, %
1	Norway	71	...	Ukraine	40
2	Denmark	71	...	Senegal	40
3	Sweden	71	...	Belarus	38
4	Iceland	68	...	Cameroon	38
5	Canada	68	55	<b>Russia</b>	<b>38</b>
...	Great Britain	67	...	Poland	38
8	Germany	66	...	Kenya	38
...	Netherlands	66	...	Madagascar	38
...	Australia	64	...	Serbia	38
...	Austria	63	...	Togo	38
...	Australia	64	...	UAE	38
...	Finland	63	...	Bulgaria	35
...	New Zealand	61	...	Cyprus	35
...	Singapore	59	...	Argentina	28
...	Switzerland	58	...	China	28
14	USD billion	57	...	India	24
...	Czech	57	...	Romania	22
...	<b>Sverdlovsk region</b>	<b>51</b>	...	...	...
38	Japan	43	141	Albania	14
...	Zimbabwe	41	142	Afghanistan	14
...	Mongolia	41	143	Syria	13
...	Turkmenistan	41	144	Yemen	13
...	Zambia	40	EU average		52
...	Kazakhstan	40	OECD average		55
...	Madagascar	40	Country average		35
...	Mongolia	40	BRICS countries average		28



A group of schoolchildren and students of secondary professional educational organizations preferred an aggressive strategy, in which current consumption should be reduced in favor of expanded investment in foreign and digital currencies, the purchase of futures contracts (subject to the availability of such financial instruments). It is expected that a group of pensioners preferred a conservative strategy for managing financial resources: expanding sources of income through the sale of household products, temporary and seasonal part-time jobs, while creating savings by placing them on deposits in commercial banks.

These results allow us to conclude that the category of respondents with a relatively high level of financial literacy not only has an idea of the strategy for managing disposable income, but also use their knowledge to optimize the structure of financial resources at the disposal of their households.

In conclusion of the study, the authors presented the results of a survey on the use of digital financial technologies by respondents who took part in the survey on assessing the level of financial literacy (Figure 4).

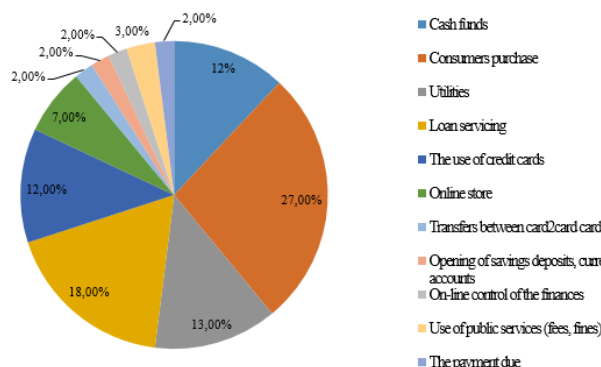


Fig. 4. The structure of monetary transactions of respondents who took part in assessing the level of financial literacy

As can be seen from Figure 4, the audience of respondents who participated in assessing the level of financial literacy uses cash settlement of current transactions 21% less often; more often respondents use the electronic format when paying utility bills (by 3%); in servicing credit obligations (by 8%) and 4% more often they use credit cards.

Interpretation of such a result may indicate more advanced users from the sample - these are people who receive higher education and their family members, who, as shown, have a level of financial literacy significantly higher than the average Russian indicator.

It was noted that the study was not conducted in laboratory conditions, which means that its results are distorted by a number of determinants:

- part of the audience was questioned in absentia, i.e. the time for answers was not limited and external assistance could be used to answer questions;
- the structure of transactions is compiled from the words of the respondents, which carries subjectivity - it is not possible to verify the accuracy of the statements;
- the difficulty of interpreting some results, in particular: the use of cashless payments in general and in certain

areas (payment of utilities, fines, loan servicing) may not mean that “non-respondents” use cash for them, this may simply indicate a different user structure. For example, if people do not have vehicles for each family member or do not violate traffic rules, then these members do not pay fines at all. Or, part of the population does not have loans - it is clear that such an assumption is somewhat at variance with the statistics on the number, growth rate and default on loans - but this also cannot be completely excluded; these creditless people do not use digital services to service them.

## V. CONCLUSION

The purity of this kind of research could be provided by an objective channel of information about the subjects of the sample:

- real data on the volume and structure of transactions through the cards available to respondents and other digital channels through which these transactions are carried out;
- conducting questionnaires to assess the level of financial literacy of the same sample of respondents in on-line format, when the influence of external auxiliary factors is completely or substantially excluded;
- the availability of data that would allow respondents to be identified by level of education, gender, profession, income level, and other parameters, so that the results would be complete, and their interpretation would allow to make reasonable and most objective conclusions.

The continuation of the study in the direction of the formation of strategies for household financial resources and their optimization is based on the following main hypotheses:

- the use by people of digital financial technologies in everyday life, contributes to awareness of the state and dynamics of available financial resources;
- development and use of financial instruments to diversify household income sources;
- awareness of responsibility for retirement, medical, social security, regardless of the situation in the system of state social guarantees;
- a balanced approach to assessing your creditworthiness to avoid loans and bankruptcy;
- formation of sources for financing human capital within households - obtaining and improving education and quality medical care;
- recognition of signs of breach of trust and the use of unfair practices in financial transactions - the exclusion of participation in financial pyramids, violation of the rights of consumers of financial services.

The authors found that financial literacy and the associated development of digital technologies by people - from mobile applications to form an expenditure structure to knowledge of financial products and the possibilities for their use, allow households to consciously formulate strategies for using

financial resources and strive to optimize their financial decisions.

The majority (88%) of those respondents in the sample who have shown high financial literacy results and who actively use digital financial technologies are involved in the formation of strategies to optimize their financial resources as part of financial planning.

The Russian authorities are carrying out large-scale work in the direction of increasing the level of financial literacy of the population: So, in the framework of the roadmap, financial literacy training is conducted in educational organizations; developed and used a training kit "Fundamentals of financial literacy". A new Bank of Russia website on financial literacy (fincult.info) has been launched. At the same time, work is underway to stimulate the use of digital financial technologies and services: the use of cashless payments, government services on the State Services portal, the taxpayer's personal account, and a number of other employees, ultimately to identify and suppress illegal financial transactions and ensure the financial security of the state.

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