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Financial Inclusion of Banking Services for Consumers in the Context of Digitalization

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ABSTRACT

The object of the study is the inclusion of banking services for making payments in the context of consumers using the Internet, mobile subscriber devices. **The subject** of the study is the factors and approaches to assessing digital financial inclusion for consumers of payment services provided by the banking sector. **The relevance** of the study is due to the need to increase financial inclusion in the context of ensuring financial stability, economic growth, prosperity and equal opportunities for all members of society, which is determined by domestic strategic priorities, as well as a global sustainable agenda, in the context of the development of digital technologies. **The purpose** of the study is to identify factors associated with increasing the inclusion of financial services for Russian consumers in the context of the development of digital technologies, using the example of payment services provided by the banking sector. **Methods** of generalization, grouping, statistical and comparative analyzes were used in the study. **As a result**, factors associated with the digital inclusion of payment services provided by the banking sector to consumers were identified, including the share of the population that are active Internet users in the total population; the number of divisions of operating credit institutions per 1 million adults, and population density. **It is concluded** that the development of digital literacy of consumers will contribute to the increase in digital financial inclusion, for which it is advisable for the state, the regulator and the financial market participant to form a need among consumers and provide the opportunity to develop digital skills to receive and ensure security when receiving financial services. **Further research** can be focused on individual components of digital financial inclusion, various groups of counterparties, certain financial services, certain types of financial institutions, including operators of financial and investment platforms, as well as on the effects and risks of the micro and macro levels.

Keywords: digital financial inclusion; digital finance; welfare; digital payments; digital literacy; information and communication technologies; online shopping; Sustainable Development Goals; digital economy; Russia

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INTRODUCTION

Issues of financial accessibility attract the attention of the government and researchers in the context of ensuring financial stability and economic growth. Reducing inequality and positive outcomes in the fight against poverty as a result of increased financial accessibility contribute to the achievement of sustainable development goals (SDGs) [1]. Financial inclusion (FI) is understood as the availability of access for individuals and legal entities to useful and affordable financial products and services that meet their needs, provided in a responsible and sustainable manner.[1] FI is a factor in increasing welfare, implying both the possibility of receiving the service itself, which is determined by the presence of financial service infrastructure, and the ability of the service to meet the corresponding need, which is determined by the usefulness, quality, and clarity of the financial service.[2]

The provision of FI banking services in the pre-digital period was ensured by the presence of a developed network of physical offices of credit organizations and was associated with high costs for the development of banking structures. Besides physical access, FI was determined by the presence of legal rights of banking counterparties to enter into a service contract and the availability of the financial service at a price [2].

In the digital economy, FI takes on the character of digital financial inclusion (DFI), the development of which is carried out in accordance with the G20 Principles.[3] DFI is considered as FI, enhanced by fintech, and retaining all the established positive effects of FI [3]. The exchange of best practices on financial digitalization issues is carried out on the platform of the Global Partnership for Financial Inclusion (GPFI).

Issues of accessibility to financial services are coming into the spotlight of financial regulators due to the need to improve the quality of life and increase welfare by leveraging the advantages provided by digital technologies to ensure stable economic growth and reduce transaction costs.

The reduction of costs in payment transactions is facilitated by the development of remote access channels for consumers to their bank accounts, which stimulates banks to use qualitatively new technologies in their operations [4, 5], aimed at creating positive macroeconomic effects [2] and implementing a sustainable agenda in the financial sector [1, 6, 7].

The relatively short period during which attention has been paid to DFI issues in Russia and around the world has determined the initial development of research on this topic. The high intensity of digitalization processes in the banking and insurance sectors of the domestic financial market [8] underscores the relevance of DFI research.

The purpose of the research is to identify factors related to the increased accessibility of financial services for Russian consumers in the context of the development of digital technologies, using the example of payment services provided by the banking sector. Research objectives: based on the systematization and critical analysis of scientific literature, identify the composition of factors related to DFI banking services for consumers; form a database of statistical indicators that allow for the evaluation of these factors, and conduct an economic-

[1] Financial Inclusion. The World Bank. URL: https://www.worldbank.org/en/topic/financialinclusion/overview (accessed on 10.04.2023).

[2] Website of the Central Bank of the Russian Federation. URL: https://www.cbr.ru/Content/Document/File/44188/onrfr_2016–18.pdf; https://www.cbr.ru/content/document/file/143773/onfr_2023–2025.pdf (accessed on 10.04.2023).

[3] G20 High-Level Principles for Digital Financial Inclusion. URL: https://www.gpfi.org/sites/gpfi/files/G20%20High%20Level%20Principles%20for%20Digital%20Financial%20Inclusion.pdf (accessed on 10.04.2023).

statistical analysis using the formed database; based on the factors identified from the analysis results, formulate directions for improving the digital accessibility of financial services.

LITERATURE REVIEW

The scientific literature addresses issues related to DFI. Studies that take into account the use of digital technologies in the economy and finance [9, 10] further develop the previously established scientific agenda of expanding access to finance.

DFI positively impacts welfare [11, 12], reduces inequality [3, 13], contributes to lowering transaction costs [14], the development of the financial market [15] and financial stability, expands consumer opportunities [16], positively affects savings formation, and stimulates innovative growth [17].

The increase in consumer welfare as a result of DFI development occurs not only due to cost reduction and the release of time resources but also through risk reduction [18] and the expansion of asset diversification when consumers invest their funds [15].

A unified methodology for assessing the accessibility of financial services is lacking [19]. When selecting a target variable that reflects DFI, researchers use two approaches. In the first approach, the study of DFI is conducted on separate aspects of finance: payments, lending, and portfolio decisions, each of which is represented by a target variable [6, 18].

The second approach involves studying DFI using indices as the dependent variable. In this case, either the published values of the DFI index [15] are used, or the index is calculated by the researchers themselves, with justification for its construction [12].

As factors related to DFI, digital payments, fintech lending, robo-advisory [11], the use of mobile phones for bill payments, mobile phone penetration, and fixed broadband penetration [6, 20, 21], the volume and number of payments, and population density are analyzed [22].

The literature on DFI develops the theme of consumer financial behavior [23, 24]. The use of mobile communication for making payments is positively influenced by the reduction of costs and the convenience of obtaining the service, while the cost and perceived risk do not have an impact [25]. The use of mobile communication means by consumers to access bank accounts is positively associated with the volume of payments in the economy [22], the growth of per capita expenditures, and the level of education [21]. The positive influence on DFI is exerted by the digital and financial literacy[4] of consumers [26]. Consumers take a passive position in the collection, analysis, and processing of information about digital access to financial services, which necessitates the enhancement of consumer rights protection and the development of measures to improve digital literacy [27]. The practical interest of consumers in improving financial literacy is determined by the increase in disposable free funds and the necessity to manage them [28].

One direction for increasing DFI in the context of financial market development in accordance with the SDGs is ensuring access to financial services for the population in remote areas. In this regard, foreign authors pay special attention to rural areas, which is particularly characteristic of studies in African countries, India, and China [12–15, 29]. Remote areas of the country are considered difficult to access and unattractive for the banking sector to establish physical presence offices, and, as a consequence, the development and use of information and communication technologies by consumers are aimed at increasing the accessibility of financial services for the population of such areas. Summarizing the obtained results, it

[4] Interconnections between Financial Accessibility and Financial Literacy: A Review of Publications. Bank of Russia. URL: https://www.cbr.ru/content/document/file/44101/publ_15022018(2).pdf (accessed on 10.04.2023).

can be noted that the studies have established a positive impact of the expansion of DFI on improving welfare and reducing the poverty level of the population in remote areas.

Thus, when selecting the target variable as the DFI indicator and related factors, researchers specify the financial service (payments, loans, savings, and investments) and the service recipient (consumers, businesses, small and medium-sized enterprises), as well as additional characteristics of the recipient, including the area of activity, place of residence, or place of business. The specification of the financial service and the characteristics of the recipient form the basis for justifying the selection of factors and indicators used to identify the relationship between the chosen factors and DFI.

DATA AND METHODS

The author's approach is based on the regulatory grouping of DFI,[5] components, which includes price, physical, assortment, and mental availability. Assortment availability is specified by the payment service provided by the banking sector to the population. As the target variable, the statistical indicator "the share of accounts opened for individuals, for which operations on the withdrawal of funds have been conducted since the beginning of the reporting year, with access provided remotely, in the total number of accounts opened for individuals that can be used for making payments" was used. The indicator allows for the assessment of the DFI service, the presence of a formed consumer demand for financial services, and the physical possibility of obtaining them.

The explanatory variables are grouped as follows. To assess the consumer's technical ability to obtain banking services without visiting a physical bank branch (the physical component of DFI), the indicators "number of fixed broadband Internet subscribers per 100 people" and "number of mobile broadband Internet subscribers per 100 people" were used. The physical possibility of obtaining a financial service is also determined by digital financial literacy in terms of the literacy of obtaining the service. To assess the digital literacy of consumers of banking services related to making payments, the indicators "share of the population that are active Internet users in the total population" and "share of the population that used the Internet to order goods and/or services in the total population" were used. The indicator of the financial services provision infrastructure "number of branches of active credit organizations per 1 million adult population" allows assessing the existence of a connection between the reduction of physical presence offices and the development of banking payment services for consumers in the digital environment [2, 22].

An important direction for increasing DFI is ensuring access to financial services for the population of remote areas. Since remote areas are characterized by low population density, the population density indicator is used to verify the existence of a relationship between the consumer's distance from the physical offices of banking sector structures and the development of remote access channels to banking payment services using information and communication technologies, including digital ones.

To assess the demand for financial services among consumers, which characterize the mental component of DFI, the following indicators were selected: "the number of payments for goods (works, services) made using payment (settlement and credit) cards issued by Russian credit organizations on the territory of Russia, per adult population, units / per adult population," "the volume of cashless payments made by individuals, per adult population, thousand rubles / per adult population," and the quality indicator of financial services, which allows

[5] Website of the Central Bank of the Russian Federation. URL: https://www.cbr.ru/content/document/file/44188/onrfr_2016–18.pdf (accessed on 10.04.2023).

Table 1

Results of the Model Validation Against the Data

R	R-square	Adjusted R-square	Standard error	Durbin Watson
0.938	0.880	0.855	1.590135	1.850

Source: Compiled by the author.

Table 2

Results of the Overall Significance Testing of the Regression Model

Model Specifications	Sum of squares	D.f.	Middle squares	F	Significance
Regression	967.030	11	87.912	34.68	0.000
Residual	131.484	52	2.529		
Total	1098.513	63			

Source: Compiled by the author.

for the assessment of trust formation in the financial market by consumers, the number of consumer complaints related to the activities of credit organization. The mental component of financial accessibility is also determined by the digital literacy of the consumer in ensuring security when obtaining financial services, for which the indicator "share of the population using information protection means in the total population using the Internet, %" has been chosen for evaluation.

To assess the price component of the DFI, the indicator "total volume of monetary expenditures of the population on the purchase of goods and payment for services, excluding payments for goods (works, services) produced abroad using bank cards" was used. Indicators characterizing the number of complaints and the total volume of monetary expenditures by the population have been recalculated taking into account the adult population of the respective area.

To achieve the research objective, a database was created, including published data obtained from surveys conducted by Rosstat on behalf of the Bank of Russia, as well as official statistical data from the Bank of Russia, Rosstat, the Ministry of Digital Development, Communications and Mass Media, and the Federal Service for State Registration, Cadastre and Cartography for the entire Russian Federation and federal districts for the period from 2014 to 2022.

RESULTS AND DISCUSSION

Econometric modeling was conducted using the SPSS software. A multiple linear regression model was chosen, which allows for testing the presence or absence of a relationship between the dependent variable (target) and several independent variables (factors).

The results of the model fit to the data and the overall significance test of the regression model are presented in *Table 1* and *Table 2*.

Table 3 presents the regression model.

In the model reflecting the relationship between the target variable and factors, all variables were included, of which three are statistically significant: the share of the population that are active Internet users in the total population; the number of branches of active credit organizations per 1 million adult population; and population density.

Table 3

Regression Model

Variable*	Coefficient	Standard error	Standardized coefficient	t-statistic	Significance
constant	13.204	12.276	-	1.076	0.287
x1	–0.214	0.138	–0.266	–1.551	0.127
x2	0.026	0.048	0.104	0.538	0.593
x3	0.102	0.095	0.248	1.078	0.286
x4	0.040	0.076	0.072	0.523	0.603
x5	**0.273**	**0.121**	**0.459**	**2.259**	**0.028**
x6	**–0.027**	**0.008**	**–0.425**	**–3.491**	**0.001**
x7	**–58.460**	**19.929**	**–0.251**	**–2.933**	**0.005**
x8	0.013	0.008	0.411	1.711	0.093
x9	–0.003	0.003	–0.306	–1.327	0.190
x10)	–0.690	0.410	–0.109	–1.683	0.098
x11	–9.852	8.472	–0.175	–1.163	0.250

Source: Compiled by the author.

Note: * x1 — the number of fixed broadband Internet subscribers per 100 people, units/100 people; x2 — the number of mobile broadband Internet subscribers per 100 people, units/100 people; x3 — the share of the population that used the Internet to order goods and/or services in the total population, %; x4 — the share of the population using information protection means in the total number of the population using the Internet, %; x5 — the share of the population that are active Internet users in the total population, %; x6 — the number of branches of active credit organizations per 1 million adult population, units/1 million people; x7 — population density, thousand people/sq. km; x8 — the number of payments for goods (works, services) made using payment (settlement and credit) cards issued by Russian credit organizations on the territory of Russia, per 1 adult population, units / 1 adult population; x9 — the volume of cashless payments made by individuals, per 1 adult population, thousand rubles / 1 adult population; x10 — the number of consumer complaints about financial services related to the activities of credit organizations, units/1,000 people; x11 — the total volume of monetary expenditures of the population on the purchase of goods and payment for services, excluding payments for goods (works, services) produced abroad using bank cards, billion rubles / 1,000 people.

The activity of the population in using the Internet is the main factor determining the target variable (DFI of the banking service for making payments for consumers). The demand for the banking service of making payments using a remote access channel to the account is present among consumers who possess the digital literacy to obtain such a service.

The absence of a significant relationship between the target variable and the number of Internet access subscribers, despite a high proportion of the population having access,[6] indicates that the overwhelming majority of the population lacks digital financial literacy, which would allow them to take advantage of digital access to finance.

The limiting factors for the development of DFI in a territorial context are the high population density and the presence of a developed network of physical offices of credit

[6] In 2022, 85% of the population had broadband access to the Internet. Rosstat website. URL: https://rosstat.gov.ru/statistics/infocommunity (accesed on 10.04.2023).

organizations, which is explained by the demand for offline services among the population in high-density areas, and confirms the importance of the mental component of DFI, including consumers' negative perception of security issues [30]. The proportion of the population using the Internet to order goods and services is statistically unrelated to the choice of bank account for making remote payments. To pay for goods and services ordered online, consumers use various methods without preferring the bank's remote payment service. Concerns about using digital channels to access banking services lead to the choice of offline services and are not related to digital literacy in ensuring security when receiving the service, nor to the proportion of the population using information protection measures on the Internet.

The development of consumers' digital literacy is facilitated by the ability to make transactions with financial organizations using financial platforms. In 2022, 142.8 thousand clients joined Russian marketplaces, and 82 127 transactions[7] were concluded, with 98.1% of the total transaction amount consisting of bank deposits. The main clients of financial platforms are consumers whose income allows them to place part of it in bank deposits.

Thus, the greatest influence on the development of DFI banking services for making payments is exerted by their physical component, which determines the need to develop digital skills among consumers and confirms the necessity of enhancing their digital literacy both in terms of receiving financial services and ensuring the security of their receipt. Improving digital literacy will contribute to the development of the mental component of DFI, creating a conscious need for consumers to use the advantages of digital technologies to access banking services. A factor increasing the need for digital access to finance will be the rise in consumer incomes. The operation of financial platforms will ensure the expansion of DFI, as well as positive effects for the competitive environment and the development of the financial market.

[7] Overview of platform services in Russia. Central Bank of the Russian Federation. URL: https://cbr.ru/Content/Document/File/146720/platform_services_20230515.pdf (accesed on01.06.2023).

CONCLUSION

In the literature, digital financial inclusion is considered as augmented fintech FI, or the ability to access finances, the development of which determines positive effects for the economy, the financial sector, and consumers of financial services.

The selection of factors and indicators used by DFI researchers is justified for a specific financial service, certain characteristics of its recipient, and the type of financial organization providing the service.

The main directions for the development of DFI for consumers are increasing digital financial literacy, raising consumer incomes, building trust in the financial market, including through the development of responsible financial service practices and the protection of consumer rights.

Further DFI research is possible taking into account the factors that determine the choice of financial services consumers, including income; it will focus on various financial services provided, including those using financial and investment platforms, as well as on certain categories of counterparties of financial organizations. DFI research will develop in the context of economic growth, digitalization, financial stability, sustainable agendas, as well as the risks generated by DFI and approaches to their management.

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REFERENCES

1. Sharma U., Changkakati B. Dimensions of global financial inclusion and their impact on the achievement of the United Nations Development Goals. *Borsa Istanbul Review*. 2022;22(6):1238–1250. https://doi.org/10.1016/j.bir.2022.08.010
2. Demirguc-Kunt A., Beck T., Honohan P. Finance for all: Policies and pitfalls in expanding access. A World Bank Policy Research Report. 2008;(41792). URL: https://openknowledge.worldbank.org/bitstream/handle/10986/690 5/417920PAPER 0Fi18082137291301PUBLIC 1.pdf?sequence=1&isAllowed=y
3. Lee C.-C., Lou R., Wang F. Digital financial inclusion and poverty alleviation: Evidence from the sustainable development of China. *Economic Analysis and Policy*. 2023;(77):418–434. https://doi.org/10.1016/j.eap.2022.12.004
4. Manuylenko V., Borlakova A., Milenkov A., Bigday O., Drannikova E., Lisitskaya T. Development and Validation of a Model for Assessing Potential Strategic Innovation Risk in Banks Based on Data Mining-Monte-Carlo in the "Open Innovation" System. *Risks*. 2021;9(6):118. https://doi.org/10.3390/risks9060118
5. Gruzdeva K., Zaborovskaya A. Competitiveness of Russian banks in the era of development of financial technologies. *Bankovskoe delo = Banking*. 2022(7):70–75 (In Russ.)
6. Demir A., Pesqué-Cela V., Altunbas Y., Murinde V. Fintech, financial inclusion and income inequality: a quantile regression approach. *The European Journal of Finance*. 2022;28(1):86–107. https://doi.org/10.1080/1351847X.2020.1772335
7. Lopukhin A., Plaksenkov E., Silvestrov S. Fintech as a factor in accelerating inclusive sustainable development *Mir novoi ekonomiki = The world of the new economy*. 2022;16(1):28–44. (In Russ.)
8. Evlakhova Yu. S. Russian Bancassurance Perspectives: From Path Dependence to Ecosystem. *Finance: Theory and Practice*. 2022;26(3):33–49. https://doi.org/10.26794/2587–5671–2022–26–3–33–49
9. Konyagina M., Belotserkovich D., Vorona-Slivinskaya L., Pronkin N. Measures to ensure cybersecurity and regulation of the internet of things in the Russian Federation: effectiveness assessment. *Journal of Economic Issues*. 2023;57(1):257–274. DOI: 10.1080/00213624.2023.2170136
10. Manuylenko V., Ermakova G., Gryzunova N., Koniagina M., Milenkov A., Setchenkova L., Ochkolda I. Generation and assessment of intellectual and informational capital as a foundation for corporations' digital innovations in the "open innovation" system. *International Journal of Advanced Computer Science and Applications*. 2022;13(9):922–932. DOI: 10.14569/IJACSA.2022.01309118
11. Agarwal S., Chua Y.H. FinTech and household finance: a review of the empirical literature. *China Finance Review International*. 2020;10(4):361–376. https://doi.org/10.1108/CFRI-03–2020–0024
12. Chen B., Ren J. Does the Adoption of Digital Payment Improve the Financial Availability of Farmer Households? Evidence from China. *Agriculture*. 2022;12(9):1468. https://doi.org/10.3390/agriculture12091468
13. Simontini D., Chatterjee A. Impacts of ICT and digital finance on poverty and income inequality: a sub-national study from India. *Information Technology for Development*. 2023;(05 Jan). https://doi.org/10.1080/02681102.2022.2151556
14. Zhao C., Wu Y., Guo J. Mobile payment and Chinese rural household consumption. *China Economic Review*. 2022;(71):101719. https://doi.org/10.1016/j.chieco.2021.101719
15. Lu X., Lai Y., Zhang Y. Digital financial inclusion and investment diversification: Evidence from China. *Accounting and Finance*. 2022;(First published: 26 December). https://doi.org/10.1111/acfi.13043
16. Ürgüplü Ö., Hüseyinoğlu Y.I.Ö. The mediating effect of consumer empowerment in omni-channel retailing. *International Journal of Retail & Distribution Management*. 2021;49(11):1481–1496. https://doi.org/10.1108/IJRDM-10–2020–0403
17. Alhassan T., Guryanov S., Kouadio A. The impact of mobile money, remittances, and financial development on innovative growth in sub-Saharan Africa. *Economy of region*. 2021;17(1):276–287. https:// doi.org/10.17059/ekon.reg.2021–1–21
18. Wang X., Wang X. Digital financial inclusion and household risk sharing: Evidence from China's digital finance revolution. *China Economic Quarterly International*. 2022;2(4):334–348. https://doi.org/10.1016/j.ceqi.2022.11.006

19. Prokopyeva E., Bushkov A. Methodology for assessing the availability of financial services *Bankovskoe delo = Banking*. 2023;(2):36–40 (In Russ.)
20. Shaikh A., Glavee-Geo R., Karjaluoto H., Hinson E. R. Mobile money as a driver of digital financial inclusion. *Technological Forecasting and Social Change*. 2023;186(Part B):122158. https://doi.org/10.1016/j.techfore.2022.122158
21. Aurazo J., Vega M. Why people use digital payments: Evidence from micro data in Peru. *Latin American Journal of Central Banking*. 2021;2(4):100044. https://doi.org/10.1016/j.latcb.2021.100044
22. Pelletier A., Khavul S., Estrin S. Innovations in emerging markets: the case of mobile money. Industrial and Corporate Change. 2020;29(2):395–421. https://doi.org/10.1093/icc/dtz049
23. Gamukin V. Savings and loan behaviour of the population in the russian regions. *Ekonomika regiona = Economy of Region*. 2020;16(3):1003–1017. (In Russ.)
24. Evlakhova Y., Alifanova E., Tregubova A., Koshel' N. Vulnerability of russian systemically important domestic banks to large-scale deposit outflow Business 4.0 as a Subject of the Digital Economy. Springer, Cham, 2022;(629–636). https://link.springer.com/chapter/10.1007/978–3–030–90324–4_101
25. Senyo PK, Osabutey E.L.C. Unearthing antecedents to financial inclusion through FinTech innovations. *Technovation*. 2020;(98):102155. https://doi.org/10.1016/j.technovation.2020.102155
26. Lo Prete A. Digital and financial literacy as determinants of digital payments and personal finance. *Economics Letters*. 2022;(213):110378. https://doi.org/10.1016/j.econlet.2022.110378
27. Dinh V., Le D.-V., Duong D., Pham D. Determinants affecting digital financial consumer protection: Evidence from 135 countries. *The Journal of Economic Asymmetries*. 2023;(27): e00301. https://doi.org/10.1016/j.jeca.2023.e00301
28. Aleksandrova O., Alikperova N., Vinogradova K., Nenakhova Yu. Conceptual approaches to creating the preconditions for effective financial education of the Russian population. *Economic and Social Changes: Facts, Trends, Forecast*. 2020;13(4):169–185. DOI: 10.15838/esc.2020.4.70.10
29. Karunakaran S., Gopinathan N. Role of Digitalisation in Rural Banking Sector in Madurai, India. *Finance: Theory and Practice*. 2023;27(1):76–90. https://doi.org/10.26794/2587–5671–2023–27–1–76–90
30. Semerikova E. What hinders the usage of smartphone payments in Russia? Perception of technological and security barriers. *Technological Forecasting and Social Change*. 2020;(161):120312. https://doi.org/10.1016/j.techfore.2020.120312

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