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IMPACT OF GREEN FINTECH SOLUTIONS ON ACHIEVING ESG PRINCIPLES

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ABSTRACT

The rapid development of digitalization and the associated transformation of society have created conditions not only for the adaptation of existing FinTech innovations but also for the formation of new directions that fulfill more specific goals and needs of the consumer market, which is Green FinTech. The article considers the global development of Green FinTech, systematizes these directions, and determines their role in achieving sustainable development goals. The article presents different approaches to the concept of FinTech, indicates the factors and technologies that affect its development, and identifies modern trends and opportunities for building an ecological model of the economy based on sustainable development. The authors conclude that the application of FinTech in image and charitable eco-projects, green investment, and the formation of a green digital infrastructure testify to the prospects of this direction and the opportunity of using Green FinTech to build an ecological model of the economy based on sustainable development.

Keywords: financial market, FinTech, Green FinTech, green innovations, green investments, socially responsible business, sustainable development.

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IMPACTO DAS SOLUÇÕES FINTECH VERDES NO ALCANCE DOS PRINCÍPIOS ESG

RESUMO

O rápido desenvolvimento da digitalização e a transformação associada da sociedade criaram condições não só para a adaptação das inovações FinTech existentes, mas também para a formação de novas direções que cumpram objetivos e necessidades mais específicas do mercado consumidor, que é a Green FinTech. O artigo considera o desenvolvimento global da Green FinTech, sistematiza essas direções e determina o seu papel na consecução dos objetivos de desenvolvimento sustentável. O artigo apresenta diferentes abordagens ao conceito de FinTech, indica os fatores e tecnologias que afetam o seu desenvolvimento e identifica tendências e oportunidades modernas para a construção de um modelo ecológico de economia baseado no desenvolvimento sustentável. Os autores concluem que a aplicação da FinTech em ecoprojetos de imagem e de caridade, o investimento verde e a formação de uma infraestrutura digital verde atestam as perspectivas dessa direção e a oportunidade de usar a FinTech Verde para construir um modelo ecológico da economia baseado sobre o desenvolvimento sustentável.

Palavras-chave: mercado financeiro, FinTech, FinTech Verde, inovações verdes, investimentos verdes, negócios socialmente responsáveis, desenvolvimento sustentável.

IMPACTO DE LAS SOLUCIONES FINTECH VERDES EN EL CUMPLIMIENTO DE LOS PRINCIPIOS ESG

RESUMEN

El rápido desarrollo de la digitalización y la transformación asociada de la sociedad han creado las condiciones no solo para la adaptación de las innovaciones FinTech existentes sino también para la formación de nuevas direcciones que cumplan objetivos y necesidades más específicos del mercado de consumo, que es el Green FinTech. El artículo considera el desarrollo global de Green FinTech, sistematiza estas direcciones y determina su papel en el logro de los objetivos de desarrollo sostenible. El artículo presenta diferentes enfoques del concepto de FinTech, indica los factores y tecnologías que afectan su desarrollo e identifica tendencias modernas y oportunidades para construir un modelo ecológico de economía basado en el desarrollo sostenible. Los autores concluyen que la aplicación de FinTech en proyectos ecológicos de imagen y caridad, la inversión verde y la formación de una infraestructura digital verde atestiguan las perspectivas de esta dirección y la oportunidad de utilizar Green FinTech para construir un modelo ecológico de economía basado en sobre el desarrollo sostenible.

Palabras clave: mercado financiero, FinTech, Green FinTech, innovaciones verdes, inversiones verdes, negocios socialmente responsables, desarrollo sostenible.

INTRODUCTION

In the modern era of information technology and computerization, the digital economy has a profound impact on all areas of life, such as education, daily consumption, healthcare, finance, and the functioning of government structures. The financial market is no exception. The generation, storage, and transmission of information are among the main activities of the monetary sector. Customer financial claims and liabilities are recorded as bits of data; payments and transactions are processed through information flows; and data analytics helps financial institutions better assess creditworthiness. These are just some examples that indicate how much the financial industry needs data processing. Accordingly, this explains why the financial sector is one of the sectors in which more investment has been directed to information and communications technologies.

As a result, the FinTech industry is turning into an independently developing sector of the modern global economy. Within the provision of financial services, the concept of FinTech emerged and became a powerful trend, which was a novelty both in terms of theoretical substantiation in scientific literature and practical aspects of adapting modern IT in the financial sector.

The global financial technology market is one of the fastest growing in today's world. According to expert estimates, the number of users of financial technologies is growing by 15-20% annually, which contributes to the spread of the Internet. The FinTech market is expected to reach $191,840.2 million by 2025 and $325,311.8 million by 2030 [1].

One of the indicators characterizing the development of the FinTech market is the number of users and the average value of their transactions in monetary terms. Global FinTech takes a leading position in the dynamics of its development, including the reach of end users, whose number is growing by 10% annually [2]. The segment of digital payments has the largest share of users – 87% (about 5 billion users). The most dynamic segment is neobanking which is expected to grow by 38% each year until 2025 [3].

The main sources of funding for FinTech projects are venture capital, mergers and acquisitions, and private equity. Alternative funding sources are popular among start-ups: crowd-funding, crowd-investing, P2B lending, online factoring, etc. However, venture funding dominates. According to [4], its share in the total amount of funding exceeds 70%.

In 2020, the COVID-19 pandemic sped up the transformation of the financial sector, while changing the vector towards the development of financial technologies.

Considering that one of the main guidelines for the modern development of society is the formation of socially responsible business models and the achievement of positive effects according to ESG criteria, it is reasonable to seek opportunities to attain these goals in the FinTech segment and to single out the category of FinTech services and FinTech innovations like Green FinTech.

LITERATURE REVIEW

To study the development of FinTech technologies, we consider scientific works concerned with the impact of digitalization on the global financial market and sustainable development [5-7].

According to literature sources, FinTech is:

1) An industry that consists of companies that use technology to provide financial services in a more efficient way, and companies from this industry are mainly start-ups aimed to make a breakthrough in existing financial systems and organizations using software [8];

2) The scope of tech start-ups making a revolution in such areas as mobile payments, money transfers, loans, fundraising, and even asset management [9];

3) A business direction based on the use of software for the provision of financial services [10].

The factors actively stimulating the development of FinTech include the global spread of the Internet and digitalization processes that cover almost all spheres of human life, including the financial sector [11].

Issues related to the development of Green FinTech, given the novelty of this phenomenon, are not sufficiently developed in the relevant scientific literature [12-15]. The research subject is such areas related to Green FinTech as green finance [16, 17] and FinTech innovations [18, 19].

The development of FinTech, green finance, and sustainable development is influenced by the next generation of technologies directly connected to the Internet. Below are some examples:

– Mobile technologies foster a new direction in the financial sector, i.e., mobile green banking for managing a bank account via mobile devices [20];

– The analysis of big data allows financial institutions to identify categories of new eco-oriented consumers, create the most personalized products, etc. [21];

– Artificial intelligence helps financial companies to be proactive and provide the most personalized service while reducing costs. An example of AI in the green financial sector includes systems for automating process management and internal foreign exchange transactions, optimizing trading activities to improve personalized banking experience, creating more effective fraud detection measures, communicating credit decisions, etc. [22];

– Blockchain technology gives rise to cryptocurrencies and digital means of payment (currencies) that do not require an account in a traditional bank. It is enough to register online in the corresponding payment system [23];

– Virtual and augmented reality technologies are used by both classical financial institutions and FinTech start-ups to improve the quality of remote service and increase customer loyalty, for example, opening fully functional virtual branches, creating financial literacy training services, organizing virtual entertainment venues for customers [24];

– Contactless technologies for contactless payments use devices with an integrated NFC chip like a smartphone or a bracelet [25];

– Biometric technologies are used in identification and authentication systems to improve the security of ongoing transactions [26].

According to scholars, the introduction of FinTech in eco-oriented areas of activity expands and personalizes product offerings and simplifies access to them [27]; gradually blurs the boundaries between financial products and services [28]; leads to the emergence and development of flexible business models that operate in new market niches based on the principles of sustainable development [29].

In addition, FinTech allows for increased business efficiency. According to experts, the cost of supporting transactions related to finances is declining around the world [30]. FinTech solutions help to significantly reduce the cost of attracting and servicing customers, assess and prevent existing and emerging risks, find new sources of income, etc. Business transparency increases, and distributed systems gradually restructure existing business models, making them as transparent as possible [31].

The research hypothesis is as follows: Green FinTech is a promising direction and can be used to build an ecological model of the economy based on sustainable development.

The article fulfills the following research objectives:

– To determine the main directions of developing Green FinTech;

– To consider the opportunities for Green FinTech for building an ecological model of the economy based on sustainable development.

METHODS

The research data were taken from a review of secondary sources. The source base was represented by two sets of sources:

– The first array consists of scientific works aimed at studying existing FinTech technologies;

– The second array comprises scientific studies aimed at analyzing the prospects of using FinTech technologies to build an ecological model of the economy based on sustainable development (Green FinTech).

When forming the source base of the study and searching on the Internet, we used the following keywords: “FinTech”, “Green FinTech”, “financial services”, “sustainable development”, “digital services”, “green digital financing”, and “start-up”.

We considered the source base using the methods of theoretical generalization, comparative analysis, analysis, and synthesis and showed the main directions of the modern development of Green FinTech, as well as the opportunities for Green FinTech to build an ecological model of the economy based on sustainable development.

RESULTS

In the course of the study, we analyzed literature sources and generalized the cases of combining elements of socially responsible business and innovations in the field of FinTech to identify three main areas of modern development of Green FinTech in the world (Table 1).

Table 1. The main directions of the modern development of Green FinTech

No.	Development directions	Company	Source
1	Charity and image eco-projects	Stripe, Ecosia, Aspiration	[12, 14, 24]
2	FinTech solutions in green investment	Atmos, Trine, RaiseGreen	[15, 16, 19, 20]
3	Infrastructure projects and Green FinTech management	Vandebron Energy, Piclo, Blueyellow, Treelion, Doconomy	[13, 22, 25, 28]

Source: compiled by the authors

DISCUSSION

The first direction of Green FinTech is characterized by the absence of direct financial reward for the investor (donor) and is aimed at achieving positive environmental effects by

reducing carbon dioxide emissions, optimizing the use of plastic, increasing green spaces on the planet, etc. The goals in this area can be attained by financial intermediaries and FinTech companies using various tools. For instance, Stripe, a US technology company, provides a wide range of services in the field of accepting and processing electronic payments and offers its corporate clients to automatically transfer a certain percentage of their income (according to a predetermined percentage of contributions) to finance advanced technologies to reduce carbon emissions. Companies making contributions receive a special green badge that can form a positive image [12].

One more case is the use of wooden payment cards by Ecosia, a German company that invested £1 million in the British FinTech start-up Treecard [14]. Wooden payment cards perform all the functions of traditional debit cards. Unlike the latter, they are made exclusively from organic and recycled materials, and the commission for their use is used to finance tree planting in 15 different countries. In this case, the commission is not charged to the user but to the seller or store where purchases are paid for. Users of such cards can track their spending and see how many trees they have planted.

A similar goal is pursued by Aspiration. In 2020, the company introduced a Plant Your Change feature for current accounts, which consists of rounding up the amount of any transaction to the nearest sum in dollars and transferring the difference to fund tree planting. In 2021, the company began issuing Aspiration Zero payment cards which, through deductions on each purchase, allow their owners to offset their carbon footprint, as well as receive cashback when the target amount of monthly deductions is reached [24].

The next important direction in the development of Green FinTech is the use of innovative financial technologies in green investment. Unlike charitable and image-building eco-projects, green investment aims at making a profit. However, projects are selected with due regard to their compliance with the goals of sustainable development. In the case of FinTech-based green investment, end investors might control their participation in the chosen project. For example, Atmos created an innovative model for climate-friendly banking. Working with various financial institutions, Atmos accumulates funds in deposit accounts and directs them to investments exclusively in climate-positive infrastructure with the purpose of accelerating the transition to a clean, fair, and transformed economy. In particular, renewable energy sources, energy efficiency projects, electric transport, green building, and regenerative agriculture determine the priority areas for investment in Atmos [15].

An alternative option that provides for the active participation of investors in the selection of green investment objects is the creation of specialized investment platforms for

placing projects on energy efficiency, renewable energy, etc., following the example of crowd-funding and peer-to-peer online platforms. A significant advantage of this approach is the opportunity to transfer financing of the corresponding projects to the regional or local level, as well as increase the number of attracted investors, including from the local community, without increasing transaction costs. Green FinTech companies such as Trine and Raise Green operate like online platforms.

Trine specializes in investments in solar power. The algorithm for participating in green investment using the Trine platform is simple and includes the following stages: pre-registration on the website; selection of an investment object among the proposed options with due regard to location, size, risks, and other parameters; determination of the investment amount (minimum 25 Euros). Upon successful completion of the project, the investor receives a reward in the form of interest [16].

A similar approach is used in the functioning of the Raise Green platform created as a licensed financial portal of the US Securities and Exchange Commission (SEC) and the Financial Industry Regulatory Authority (FINRA). Through the Raise Green platform, one can invest in any local eco-project. Users can be accredited and non-accredited, individual and institutional investors. In addition to direct financial information about investments, the platform shows the expected results of investments, i.e., the volume of kilowatt-hours of clean energy that are created due to the contribution of each investor [20].

The principle of online platforms is actively used in another direction of Green FinTech development, namely, management and infrastructure projects. Following the example of crowd-funding platforms, it is possible to create local marketplaces for providing and receiving energy. In turn, AI technologies are used to reduce energy consumption and form networks for more efficient distribution of energy among platform users.

Green FinTech technologies allow participants to buy and sell energy in retail or wholesale markets on a peer-to-peer basis and community-centric energy systems such as microgrids. Microgrid users can choose where they want to receive energy from. This approach has several examples of successful applications in the world: the Vandebron Energy platform in the Netherlands or the Piclo platform in the UK. There are also online platforms that mediate renewable energy transactions, for example, the Swiss platform Blue Yellow [13].

Attention should be paid to projects that have a broader focus and contribute to the development of various types of Green FinTech products. Established in 2019, the Treelion Foundation is implementing projects in more than 30 countries and regions of the world with a total value of more than $1 billion. The main objective of the organization is to build a green

digital financial infrastructure based on blockchain technology. Its strategic guidelines embrace activities to solve the problems of land, air, soil, and biological pollution to promote the creation of an ecological civilization; support sustainable and green business through a combination of ecology, finance, and digital technologies, creating the largest green digital data ecosystem; maintaining a database on the global environment and biological diversity using blockchain technology; promote environmental cooperation at the international, regional, national, and local levels [25].

Another example is Doconomy, a Swedish start-up focused on building an ecosystem of financial tools to educate and drive positive changes [28]. Doconomy is partnering with the Finnish bank Alandsbanken, the United Nations, and MasterCard to raise global climate change awareness through the power of international banking and global payment technologies.

CONCLUSION

The modern development of FinTech provides the financial services market with innovative solutions, increasing the efficiency of its functioning. The flexibility and adaptability of FinTech extend effective technological developments to other areas of public life. FinTech has a significant potential for being used in green finance and socially responsible business.

The application of FinTech in image and charitable eco-projects, green investment, and the formation of a green digital infrastructure indicate the prospects of this direction and the opportunity for using Green FinTech to build an ecological model of the economy based on sustainable development.

REFERENCES

Gomber, P., Kauffman, R.J., Parker, C., Weber, B.W. On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services // Journal of Management Information Systems. 2018. 35. P. 220-265.

Al-Okaily, M., Al Natour, A.R., Shishan, F., Al-Dmour, A., Alghazzawi, R., Alsharairi, M. Sustainable FinTech innovation orientation: A moderated model // Sustainability. 2021. 13. 13591 pp. URL: https://doi.org/10.3390/su132413591

Nizam, E., Ng, A., Dewandaru, G., Nagayev, R., Nkoba, M.A. The impact of social and environmental sustainability on financial performance: A global analysis of the banking sector // Journal of Multinational Financial Management. 2019. 49. P. 35-53.

Gozmann, D., Libenau, J., Mangan, J. The Innovation Mechanisms of Fintech Start-Ups: Insights from SWIFT's Innotribe Competition // Management Information Systems. 2018. *35*(1). P. 145-179.

Wonglimpiyarat, J. FinTech banking industry: a systemic approach // Foresight. 2017. *19*(6). P. 590-603.

Bush, T., Bauer, R., Orlitzky, M. Sustainable Development and Financial Markets: Old Paths and New Avenues // Business & Society. 2015. *55*(3). P. 303-329.

Weber, O. The financial sector's impact on sustainable development // Sustainable Finance & Investment. 2014. *4*(1), P. 1-8.

Punschmann, T. FinTech // Business & Information Systems Engineering. 2017. *59*(1). P. 69-76.

Weichert, M. The future of payments: How FinTech players are accelerating customer-driven innovation in financial services // Payments, Strategy and Systems. 2017. *11*(1). P. 23-33.

Pawłowska, M., Staniszewska, A., Grzelak, M. Impact of FinTech on sustainable development // Financial Sciences. 2022. *27*(2). P. 50-66.

Anshari, M., Almunawar, M., Masri, M., Hamdan, M. Digital Marketplace and FinTech to Support Agriculture Sustainability // Energy Procedia. 2019. Vol. 156. P. 234-238.

Ranchber, S. Stimulating Green FinTech Innovation for Sustainable Development: An Analysis of the Innovation Process Master thesis in Sustainable Development. Uppsala, 2018. 70 pp.

Aboalsamh, H.M., Khrais, L.T., Albahussain, S.A. Pioneering Perception of Green Fintech in Promoting Sustainable Digital Services Application within Smart Cities // Sustainability. 2023. Vol. 15, 11440 pp. URL: https://doi.org/10.3390/su151411440

Puschmann, T., Hoffmann, C.H., Khmarskyi, V. How Green FinTech Can Alleviate the Impact of Climate Change – The Case of Switzerland // Sustainability. 2020. *12*(24). 10691 pp. URL: https://doi.org/10.3390/su122410691

Macchiavello, E., Siri, M. Sustainable Finance and Fintech: Can Technology Contribute to Achieving Environmental Goals? A Preliminary Assessment of 'Green FinTech' // European Banking Institute Working Paper Series. 2020. Vol. 71. URL: https://ssrn.com/abstract=3672989 or http://dx.doi.org/10.2139/ssrn.3672989

Mirza, N., Umar, M., Afzal, A., Firdousi, S.F. The role of Fintech in promoting green finance and profitability: Evidence from the banking sector in the Euro zone // Journal of Economic Analysis & Policy. 2023. 78. P. 33-40.

Yang, Y., Su, X., Yao, S. Nexus between green finance, FinTech, and high-quality economic development: Empirical evidence from China // Resources Policy. 2021. Vol. 74. P. 102-445.

Zhou, G., Zhu, J., Luo, S. The impact of FinTech innovation on green growth in China: Mediating effect of green finance // Ecological Economics. 2022. Vol. 193. P. 107-308.

Arner, D., Buckley, R., Zehzche, D., Veidt, R. Sustainability, FinTech and Financial Inclusion // The European Business Organization Law Review. 2020. Vol. 21. P. 7-35.

Wang, Y., Zhi, Q. The Role of Green Finance in Environmental Protection: Two Aspects of Market Mechanism and Policies // Energy Procedia. 2016. Vol. 104. P. 311-316.

Zhou, G., Zhu, J., Luo, S. The impact of fintech innovation on green growth in China: Mediating effect of green finance // Ecological Economics. 2022. Vol. 193. P. 107-308. URL: https://doi.org/10.1016/j.ecolecon.2021.107308

Metawa, N., Dogan, E., Taskin, D. Analyzing the nexus of green economy, clean and financial technology // Journal of Economic Analysis & Policy. 2022. Vol. 76. P. 385-396.

Gomber, P., Koch, A., Siering, M. Digital finance and research: current research and future research directions // Business Economics. 2017. Vol. 87. P. 537-580.

Zeng, Z. Saving the world by being green with Fintech: Exploring the contradictions inherent in the case of Ant Forest. Capital. Nat. Social. 2022, 97, P. 102-997. URL: https://doi.org/10.1016/j.erss.2023.102997

Wang, K.-H., Zhao, Y.-X., Jiang, C.-F., Zheng-Zheng, L. Does green finance inspire sustainable development? Evidence from a global perspective // Economic Analysis and Policy. 2022. Vol. 75. P. 412-426.

Weiblen, T., Chesbrough, H.W. Engaging with startups to enhance corporate innovation // California Management Review. 2015. Vol. 57. P. 66-90.

Puschmann, T., Hoffmann, C.H., Khmarskyi, V. How green FinTech can alleviate the impact of climate change — The case of Switzerland // Sustainability 2020. Vol. 12. 10691 pp. URL: https://doi.org/10.3390/su122410691

Knuth, S. “Breakthroughs” for a green economy? Financialization and clean energy transition // Energy Research & Social Science. 2018. Vol. 41. P. 220-229.

Tao, Cen, Renke, He. Fintech, Green Finance and Sustainable Development Advances in Social Science // Education and Humanities Research. 2018. Vol. 291. P. 222-225.

Liu, H., Yao, P., Latif, S., Aslam, S., Iqbal, N. Impact of Green Financing, FinTech, and financial inclusion on energy efficiency // Environmental Science and Pollution Research. 2022, Vol. 22, P. 18955-18966.

Devidze, N. Current State of Green Digital Financing and the Associated Challenges // Green Digital Finance and Sustainable Development Goals - Singapore: Springer, 2022. P. 29-50.