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MODERNISATION OF FINANCIAL SYSTEMS WITH THE DEVELOPMENT OF FINTECH

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A B S T R A C T

This paper aims to review the modernisation of financial systems using fintech. Although the concept of fintech has an older origin, its wide use is recent starting from the global financial crisis of 2008-2009 and multiplied during and after the COVID-19 pandemic. For this review, 15 papers were selected using the topic as the search term on Google Scholar. PRISMA flow diagram was used to screen and select 15 papers. The review provided an overview of fintech operating globally and in some specific countries. The papers defined fintech in various ways. They described the technologies, applications and uses of fintech. Some challenges and problems were also dealt with. Some papers provided solutions for these problems and challenges. Country-specific papers dealt with its status in all these aspects. The poor quality of the papers does not allow generalisations. Based on the results of the review, the scope for future research has been indicated. Some limitations of this review have been listed.

1. INTRODUCTION

Fintech is the intersection of modernisation and financial systems with the rise of Financial Technology (FinTech). FinTech, a portmanteau of "financial technology," refers to the innovative use of technology in designing and delivering financial services. This field has significantly transformed traditional financial activities in recent years.

By leveraging advancements in areas such as artificial intelligence, blockchain technology, big data analytics, and mobile applications, FinTech companies are revolutionising the way people access and interact with financial services. These changes have implications for various aspects of finance, including banking, insurance, investment management, and payment systems.

Key areas of impact of FinTech on financial systems include increased efficiency, accessibility, transparency, and cost-effectiveness of financial services. Moreover, FinTech has the potential to democratise finance by reaching underserved populations and offering tailored solutions to a broader range of consumers and businesses. As financial institutions and regulatory bodies adapt to this rapidly evolving landscape of innovative technologies, questions regarding cybersecurity, data privacy, regulatory compliance, and systemic risk arise. Research in the field of FinTech often focuses on understanding these dynamics, assessing the implications of technological advancements, and proposing frameworks for ensuring the stability and inclusivity of financial systems in the digital age.

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This paper systematically reviews research on the modernisation of financial systems with the development of Fintech. The research question is-

How has Fintech modernised financial systems and what are its positive and negative impacts on Fintech customers?

2. METHODOLOGY

Using the review topic itself as the search term, Google Scholar was searched for the identification of the most recent papers. The inclusion criteria were full texts of papers in English. Books, book sections, dissertations, editorial comments and papers in languages other than English were excluded. The identified papers were screened and selected through the PRISMA flow diagram (Figure 1). Finally selected 15 papers are discussed in various sections below.

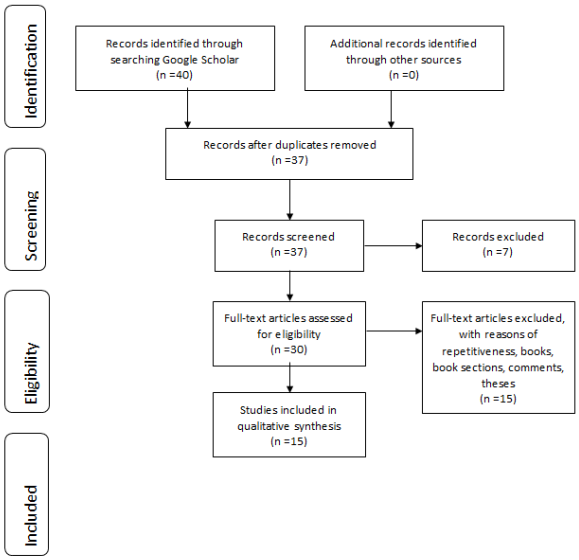

Figure 1. PRISMA

3. RESULTS

After describing the basics of fintech, Nguyen et al. (2020) reported the results of a survey of 40 experts, which identified five low-level challenges of fintech in Vietnam. They are related to legal corridors, infrastructure, Fintech companies, customers and human resources. The suggested solutions were quick completion of the regulatory framework, introduction of tax exemption policies, promotion of research, application of the benefits of blockchain technology, utilisation of the abilities of human resources and active promotion and popularisation of knowledge about fintech.

A systematic review of research by Harsono and Suprapti (2024) provided a clear understanding of the key concepts of fintech like openness, (Open Banking), financial security, operational efficiency, financial inclusivity, accessibility, quality of services and user experience. The impacts of fintech include improvement of financial services, solution of some existing problems, and provision of a holistic perspective on paradigm shifts in the financial industry. Balancing between innovation and consumer protection is a challenge for regulatory systems. Collaboration between regulatory agencies and fintech firms will help to address this issue. Creating awareness and education of both customers and fintech firms is important. Openness helps in collaboration between traditional financial institutions and fintech firms.

The analysis conducted by Muhadi (2023), which delved into legal documents, court rulings, case studies, and interviews, uncovered numerous shortcomings within Indonesian legislation regarding justice, legal protection, and legal assurance in MSME financing. It was suggested that the Financial Services Authority (OJK) undertake a thorough examination of the existing protection mechanisms within crowdlending services to ensure their alignment with relevant laws. This suggestion was in direct response to the Financial Services Authority Circular (POJK) 77/POJK.01/2016, which addresses Information Technology-Based Lending and Borrowing Services. Additionally, the establishment of crowdlending service structures necessitates an inquiry into the reporting obligations concerning fintech debtor data in the Financial Information Service System (SLIK). The emphasis from the Financial Services Authority (OJK) lies in enforcing regulations mandating the disclosure of non-performing loan ratios for each credit offering, with an added duty for the OJK to scrutinize these published ratios within the crowdlending service system. Furthermore, the involvement of the Financial Services Authority (OJK) is deemed essential during the formulation of credit agreements, necessitating that these agreements are disclosed and sanctioned by the OJK.

The study by Rupeika-Apoga and Wendt (2021) synthesised a PEST analysis focusing on the political, legal, economic, social, and technological factors influencing the FinTech sector, a survey conducted among FinTech firms, and a study examining the size and financial success of FinTech companies in Latvia over the past decade. The findings highlighted that inadequate regulation, particularly the lack of consideration for FinTech-specific dynamics, stands out as a prominent barrier to the sector's growth. Additionally, challenges in recruiting specialized talent and a non-conducive environment for financial innovations contribute to the industry's struggles. To address these issues and promote a fair competitive landscape for all market players—FinTech firms, traditional financial institutions, and entities transitioning to incorporate FinTech solutions—a comprehensive overhaul, update, and alignment of regulatory frameworks is imperative. Moreover, concerted efforts are needed to enhance Latvia's appeal to skilled professionals in the financial technology domain.

Based on the research work done in Ukraine on the role of AI in the modernisation of the financial sector in the country, Zianko and Nechyporenko (2023) observed that the application of AI in the financial sector can have significant benefits. AI techniques and algorithms, such as neural networks, genetic algorithms, pattern recognition and decision making have proven effective in many financial tasks, including financial market forecasting, risk management, financial transaction automation and decision support. AI can be adapted to reduce human errors and improve the efficiency of financial transactions. Research has given methods of AI implementation in the financial sector to improve financial stability and increase profitability. Despite all these benefits, many issues of organizational, legal, financial, information support, economic stimulation of the use of AI, and its impact on the state of the financial sector of Ukraine remain unresolved. Methods of solving these problems are not well-developed. Globalization of the financial sector creates difficulties and risks, especially, concerning financial stability, vulnerability to crises, and the possibility of market manipulation. Therefore, effective management and regulation of the globalized financial sector is important for the stability and balanced development of the world economy. The digital transformation of the world has a major impact on the financial sector, and AI is one key technology and modernization factor for this transformation. Some recent trends contributed to the emergence of new products and services, changed the way customers interact with financial institutions, and increased competition in the financial sector. However, there are risks in using AI in the financial sector like erroneous algorithms, threats to national and financial security from cyberattacks, loss of control over financial markets and job losses. There are both positive and negative consequences of using AI in the financial sector.

Currently, the economic system changes rapidly under the influence of permanent transformational processes, which include integration, globalization and digitalization. Financial services are a leading component of the national economy. The success of these services determines the quality of life of the population and its well-being. Fintech companies work to achieve effective interaction between the financial sector and innovative technologies. Mobile applications fully and quickly meet the needs of customers with financial services. This is very important for the formation and development of digitalization in financial services.

When unforeseen factors affect the digitization results of financial services companies, its momentum should be reduced. The main driver of digitalization and the purpose of using digital technology is the optimisation and control of market relations and competitive processes. This includes the provision of financial services. Changes in the context of digitalization are not technological shocks, but rather industry developments in systems rationalisation. Digital financial services increase access to financial services for vulnerable groups by overcoming barriers to costs, distance, transparency and providing financial services tailored to their needs.

However, the gender disparity remains in digital financial integration limiting women's access to digital financial services. Krylov, et al. (2022) identified six stages in the fintech development, presented in Figure 2. Since AI was not included, a seventh stage can be added to this.

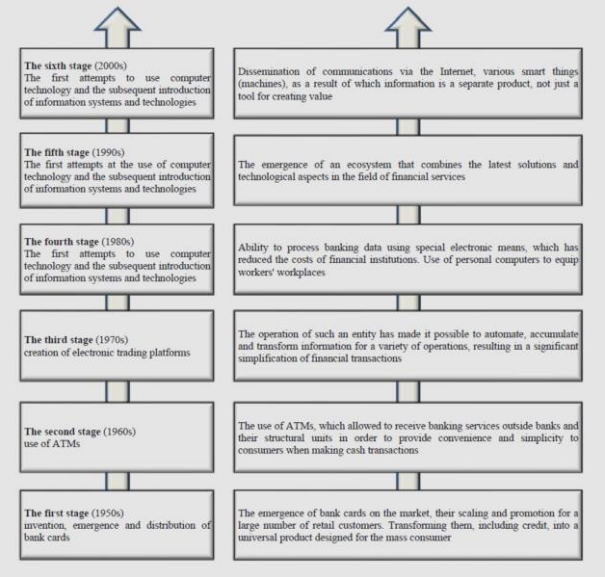

Figure 2. Stages of fintech development (Krylov, et al., 2022)

The authors described the impact of fintech services with a description of the components of a successful implementation as given in Figure 3. It is not clear whether only a successful implementation can lead to all the impacts listed in the diagram. A few of the impacts could be achieved even with partially successful implementation. Inadequate regulations may affect the trust of financial market participants. The solution is to effectively implement planning and control, optimize risk management and open information on financial condition, financial and economic and ownership structure as components of corporate governance. Fintech is the convergence of traditional financial services with mobile services, social networking services, aggregation and processing of large amounts of data and cloud technologies. Digital technologies facilitate the automation of many processes in many segments of the financial sector. Fintech developing fast because of public distrust and shortcomings of traditional financial services and the commercialisation of digital technologies. The banking and insurance sectors are most benefitted by fintech applications. However, the security and reliability of data and financial transactions remain a challenge.

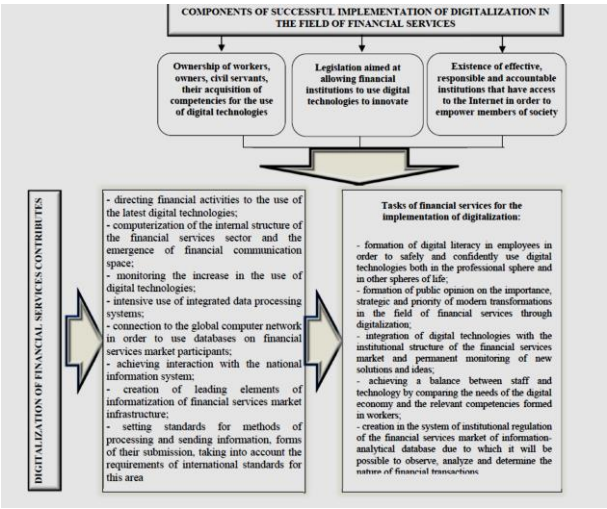

Figure 3. Components of successful implementation of fintech and its impact (Krylov, et al., 2022).

Three phases of fintech development were listed by Stezhko et al. (2020) as follows: The first period (FinTech 1.0) lasted until 1987 when the financial sector utilised, informational technologies based on analogue transmission data. In the second phase (FinTech 2.0) (1987-2008), technological innovations were introduced and funded mainly by financial sector leaders. The third period (FinTech 3.0) started after 2008. The post-crisis regulation of financial institutions required management the eliminate the most problems causing crises. This led to the emergence of numerous startups, offering effective solutions to financial institutions. It also led to the possibilities of digitalization in the future. The motivation for the Fintech revitalization was changes in the European regulatory legislation – The Directive Payment Services II (PSD 2) (European Commission, 2015). These regulations require banks to open software data to a third party only after getting the consent of the consumer and the service provider. In 2017, Ernst & Young found that globally over 33% of Internet users were actively using Fintech services. The proliferation rate of fintech services in Southern Africa, Mexico, Brazil, India and China was 46% against 28% in the developed countries. Market segmentation of fintech services in China and India is high in all areas of fintech services while in Brazil it is in a higher level of online budgeting and financial planning services. Noteworthy features of fintech are services via mobile phones, financial services and social networks, different types of payments, marketplaces, P2P credit models, balance lending, new business models, artificial intelligence, digital identification and biometrics, and open application programming interfaces. Agility to adopt innovative technologies from the best practices of other sectors allowed fintech to develop competitive advantages. FinTech platforms are compatible with the latest technologies enabling them to offer new products and services quickly with favourable regulations. Helped by many major deals, investments in fintech increased eight times from $18.9 in 2013 to $111.8 in 2018 and forecasted to $131.8 in 2020. Many fintech firms expanded globally during the recent period. Fintech in Ukraine also developed in parallel with these global trends. Many recent Ukrainian regulations favour fintech transactions.

Using a review of the literature and case studies, Yoganandham (2024) discussed the transformative impact of fintech on financial services and the regulatory framework, and the importance of adaptive strategies to maximize potential and minimize risks. The use of blockchain technology in the banking sector has provided secure and transparent solutions for transactions, identity verification, and smart contracts. Artificial intelligence and big data analytics enable a better understanding of customer behaviour, personalized services, and data-driven decision-making for risk management and operational optimization. Predictive analytics allow banks to anticipate market trends, identify opportunities, and adapt financial products to meet changing customer and business needs. However, there are potential challenges such as cybersecurity threats, data privacy concerns, and regulatory complexities that need to be addressed to ensure responsible and sustainable deployment of these technologies for the benefit of all stakeholders.

The customer preference for personalized banking services and the need for banks to adapt to these preferences using technology was stressed by Mykhailiuk, et al. (2021). The COVID-19 pandemic has accelerated the digitalization of banking services, and fintech firms have taken advantage of regulatory gaps to develop their businesses. Regulators need to consider the impact of digitalization on traditional banking models and ensure that they have the resources and authority to evaluate and address any new threats to financial stability and consumer rights. The implementation of artificial intelligence (AI) in supervision can enhance its effectiveness.

In a study Doszhan, et al. (2020) reviewed the literature and analysed documents to identify the challenges and benefits of financial technologies (fintech) in Kazakhstan and foreign countries. While fintech firms provide quicker and more convenient financial services, they also face challenges such as a lack of private investment, gaps in laws and regulations, low financial literacy, cyberattacks, and weak protection of personal data. Kazakhstan has made progress in fintech but faces similar challenges.

Ukraine showed positive developments, rising from 47th to 45th place among 131 countries in the Global Innovation Index rating. The growth in the category of education was a gain of 20 positions and high-tech R&D development was a gain of 10 positions. These positive changes demonstrated Ukraine's great potential and readiness to implement innovative technologies. Over the past five years, the Ukrainian financial sector has made

significant progress in the development of financial technologies, which was due to several factors. Digitalisation processes accelerated globally due to the economic crisis of 2008-2009 and the COVID-19 pandemic. These factors led to the establishment of many new fintech firms in Ukraine. A few laws were passed in Ukraine to facilitate fintech firms. Instant payments, virtual assets, cryptocurrency payments for various services, the development of financial literacy among the public, the creation of a research base, and other reforms were landmarks in Ukrainian fintech development. Both the advantages and disadvantages of fintech were recognised. The factors of market development for fintech in Ukraine were the increasing use of technology, partnerships and collaborations, trust and regulations and demand for many services (Zhytar, 2024).

A study by Vartsaba and Zaslavska (2020) evaluated the development of the fintech industry in Ukraine, particularly concerning its integration with the banking system. The study utilizes empirical, experimental, and theoretical analysis, as well as data from surveys conducted by various organizations. The development of fintech in Ukraine is found to be influenced by factors such as public awareness, innovation in financial institutions, market penetration of fintech companies, and the legal framework. The study also identifies barriers to fintech development, including outdated legislation, high digitalization costs, partnership issues with traditional banks, low financial literacy, poor infrastructure, and limited knowledge about financial and information technology aspects among the population. The study suggests that overcoming these barriers requires adapting communication strategies and digitization to the socio-demographic structure of Ukraine's population, improving government technical support, promoting digital skills training, and creating a platform for such training.

Based on an analysis of global sustainable financial systems and that of Ukraine, Strilchuk (2023) concluded that a necessary condition for financial inclusion and the creation of a sustainable financial ecosystem in Ukraine is stimulating the development of financial and banking innovations in Ukraine to create a sustainable financial ecosystem. This involves introducing new products and technologies, developing remote customer services, and anticipating and meeting the dynamic needs of consumers. The National Bank of Ukraine has a key role in implementing global regulatory trends and addressing the challenges of digital transformation.
Based on a survey of 415 Nigerian bank customers during the COVID-19 recovery period, Inusa, et al (2022) concluded that the relationship between sustainability and national development is positive and significant. A positive and significant relationship between transaction efficiency and national development. Thus, fintech provides financial channels that carry every citizen and reduce the poverty rate and income inequality translating to national development. The authors recommended that policymakers should continue to provide the enabling environment, including policy direction and regulation, to enhance fintech development in the country.

To explore opinions and attitudes concerning the emergence of fintech on the future of the financial services industry in Palestine, eleven in-depth interviews were conducted by Al-Daya, et al. (2021) with a group of managers working in the banking and financial services sectors represented by administrative staff from departments specialized in technical fields, product and software development, information technology, and electronic payments services. A content analysis of the reports and articles provided by the participating institutions was also done. Data were analysed thematically using NVivo software. Important roles were identified for the incumbent banking and financial institutions, academic bodies, technology companies, and business incubators to create a conducive environment for the fintech ecosystem in Palestine. Fintech in Palestine faces the main challenges of rules and regulations, cybersecurity, and customers' lack of trust toward digital services.

4. DISCUSSIONS

Out of 15 papers, five dealt with fintech development and status in Ukraine, one each in India, Kazakhstan, Nigeria, Palestine, Vietnam, Indonesia and Latvia. The other four were general. Surprisingly, there was no paper from any developed countries like the USA, UK or Germany and from China. It may not mean that there was no research on fintech in these countries. These papers might have escaped identification due to the specific search term used in Google Scholar.

Most papers had similar contents. They first described the basics of fintech, definitions, use of technology for various purposes, applications, uses, legal and regulatory issues, challenges and problems and some papers gave solutions. Country-specific papers dealt with the status of the country in these respects but not in detail.

There was one paper each which used a survey and semi-structured interviews. A few other papers mentioned their methodologies. However, the results were more verbal than data-oriented. No specific results were provided as tables or charts or statistical significance was not mentioned in them. Descriptions were elaborate with circular repetitive statements. Papers from Ukraine described the same matter repeatedly. Thus, overall, the quality of these papers was poor.

More research is required with specific quantitative, qualitative or mixed methods to elucidate the issues related to the technology-finance interface. If research on developed countries is few, this should be addressed by many more research works.

5. CONCLUSIONS

The review has provided an overview of fintech operating globally and in some specific countries. The papers defined fintech in various ways. They described the technologies, applications and uses of fintech. Some challenges and problems were also dealt with. Some papers provided solutions for these problems and challenges. Country-specific papers dealt with its status in all these aspects. The poor quality of the papers does not allow generalisations.

Limitations

Limiting the papers to 15 limited the scope of coverage of the topic. The use of the topic as the search term on Google Scholar might have caused missing some papers from developed countries. The scattered, undefined nature of some data presented in some papers did not allow meta-analysis.

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