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Analysis of the main changes in financial markets in the context of digitalization of the economy

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Abstract
To date, digitalization has become one of the most significant trends that has an impact on all areas of public life. Her role in the financial sector is no exception. That is why the study of the main aspects of digitalization in the financial sector, its impact on various sectors of the financial market and the specifics of assessing the level of development is becoming especially relevant and significant at the present stage of the evolution of economic and financial relations. In order for financial market actors to remain successful and competitive in the context of digital transformation, they need to be aware of the latest technological innovations and actively use them in their activities. This requires them to transform traditional business models in accordance with the challenges of the modern digital world. Credit institutions, insurance companies and other institutional investors are actively introducing innovations related to digital technologies. The public financial market, thanks to modern technologies such as blockchain, big data analysis and artificial intelligence, is becoming increasingly cross-border. The fintech industry is developing very rapidly, focusing on the creation of digital platforms and innovative services. The digitalization of the financial sector leads to a radical change in the models of interaction between financial market participants. The purpose of the research is to analyze the main changes in the financial markets caused by the processes of digitalization of the economy. The paper examines the trends in the development of digital technologies in the financial sector, assesses the scale of transformation of the banking system and stock exchanges under the influence of the introduction of digital innovations. The main research methods used were: analysis of statistical data on the dynamics of digitalization of financial markets, comparative analysis of traditional and digital business models in the financial market, expert assessments of the prospects for further development of digitalization processes. According to the results of the study, a conclusion was made about the deep transformation of financial markets under the influence of digital technologies. These processes will only accelerate in the coming years.

Keywords: Digitalization, financial markets, FinTech, banks, exchanges, non-cash payments, online trading.

Introduction
Digital innovations, the transformation of information exchange methods and the acceleration of management decisions affect how financial market participants build their activities. The main incentive for the digital transformation of the financial system was measures to contain the COVID-19 pandemic, which forced states to change the methods of interaction between participants in economic relations. In order to remain competitive in the new environment, financial sector participants sought to expand the availability of financial services, develop digital financial instruments and create the necessary infrastructure for their sale, consumption and maintenance at all stages of their life cycle. The rapid development of digital technologies affects the large-scale transformation of the economy and public institutions (see Figure 1). Digitalization does not bypass the financial sector, which is confirmed by the growing volume of non-cash payments, the widespread introduction of Internet banking, the emergence of crypto assets and high-tech trade. These processes radically change the usual model of functioning of financial markets.

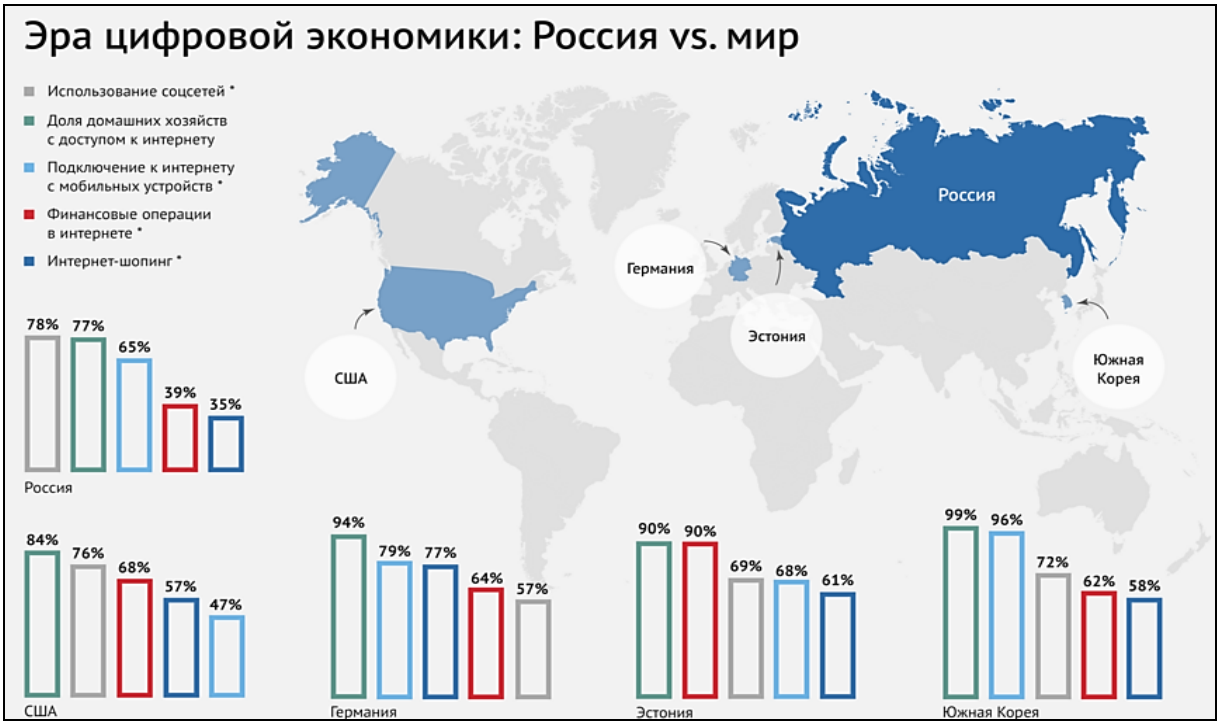

Fig 1: Digital economy in Russia and abroad [6]

The digital transformation of the financial system has far-reaching consequences for the economy and society as a whole. Understanding current trends and patterns of these processes is critically important for building effective policies on the part of financial market regulators. The purpose of the work is a comprehensive analysis of the transformation of financial markets under the influence of the digitalization of the economy. Achieving this goal will make it possible to better assess the scale of the changes taking place and develop practical recommendations for adapting traditional financial institutions to new digital realities.

A literary review

The issues of digitalization of the financial market have been actively studied by Russian and foreign economists. A specific list of sources was selected for the work, which reflects the main trends that fully reflect the topic itself.

The work of Adamenko, Khorolskaya and Tether highlights the topic of profit as an important element of financial results [2]. The authors focus on methods of profit planning and management, emphasizing its importance for the overall economic efficiency of enterprises. The pan-European examples, the processes of displacement by new models of familiar, traditional ones are considered. Aerich and Gutman discuss digitalization as a key element of an enterprise's innovation strategy [3]. Their research offers an in-depth look at how digital technologies contribute to the development of companies, citing specific examples from the Chinese market. Butkovskaya and Sumarokova analyze digital strategies in terms of their potential for growth and possible causes of failure, and give a look at how companies can effectively use digital strategies to improve their operations [8]. The United Nations Digital Economy Report 2019 [24] includes an analysis of the digital economy, especially in the context of developing countries. By combining these sources, we get a comprehensive understanding of the importance of profit and digitalization in modern business.

These works highlight the need to adapt innovations in financial management to achieve sustainable economic growth and competitiveness. The analysis of literary sources shows that the digital transformation of the financial market is accompanied by an increase in the risks of losses for both financial service providers and consumers of financial services. The slowdown in the development of the financial market generates risks for the state in the face of market regulators.

Results and Discussion

The digitalization of financial services and the emergence of fintech companies have caused significant changes [25]. Fintech is a rapidly developing field at the intersection of finance and technology, where technology startups and other new entrants are taking innovative approaches to products and services currently provided by traditional financial institutions. The fintech ecosystem includes elements such as startups, technology companies, financial institutions, and infrastructure players. [11]. New technologies open up opportunities for innovation in areas such as payments, investing, fundraising and banking. This digital breakthrough has implications for existing traditional institutions that regulate economic growth as a whole (see Figure 2). The payment landscape is undergoing major changes. Established correlators are now competing with a new generation of payment services. These include web wallets, peer-to-peer payment applications, and cross-border money transfer platforms. As a result, we get faster, and at the same time convenient ways that correspond to the newfound lifestyle [8].

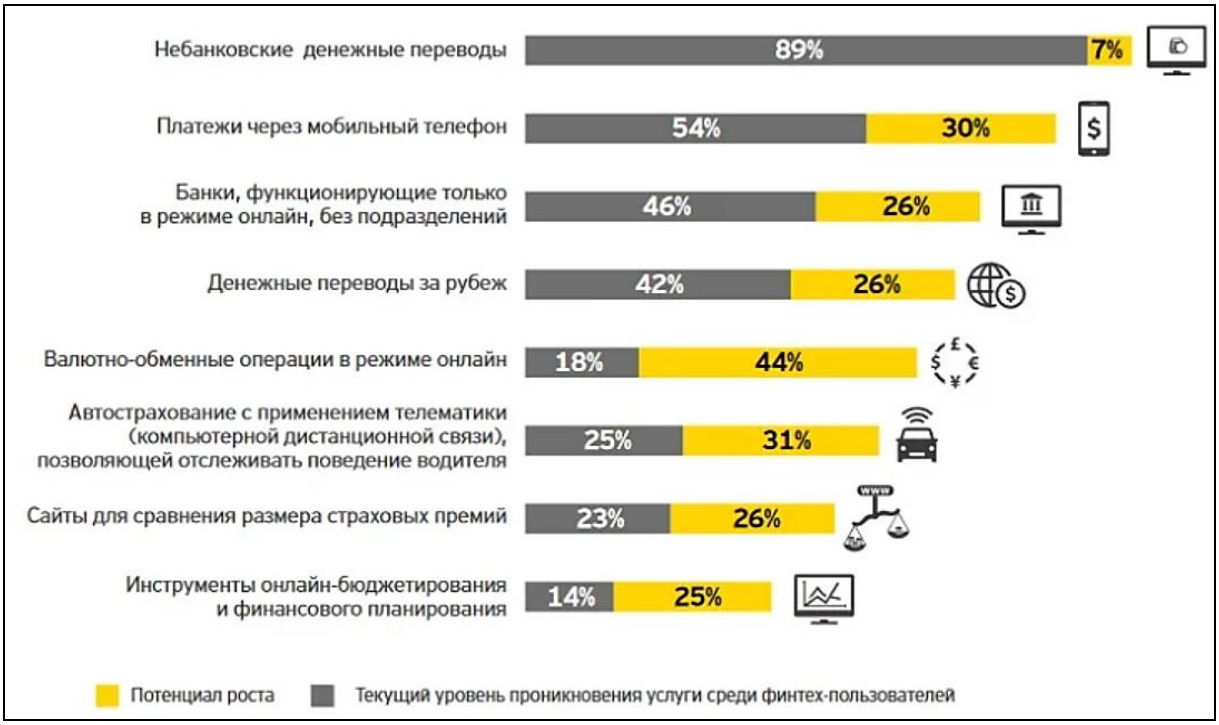

Fig 2: The growth potential of the use of fintech services [17].

In China, digital wallets have become ubiquitous thanks to services such as Alipay and WeChat Pay. These platforms allow for both online and offline payments using QR codes [3]. The rollout happened quickly: Chinese consumers now use mobile payments more often than cash for their own transactions. Multinational corporations, like Apple or Samsung, offer their counterparts to perform such services. This ensures, first of all, the variety and accessibility of digital wallets, which makes them the best choice for e-commerce [27].

Alternatives to traditional money transfer networks include services such as TransferWise and Remitely (within the framework of international payments) [26]. Created in the Internet age, such fintech companies use automation to provide cheaper cross-border bank transfers [19]. Cryptocurrencies such as Bitcoin allow peer-to-peer transfer without intermediaries, providing anonymous global payments, usually in a matter of seconds. Although volatility limits the attractiveness of cryptocurrencies as funds, the underlying blockchain technology promises to change finance and payments through decentralized registries [35].

It is worth noting that Visa and Mastercard still dominate the field of card payments, but face new competition (see Figure 3). Merchants can now accept card payments directly on smartphones thanks to startups like Square [9]. Open banking initiatives in regions such as Europe allow consumers to allow data exchange to authorized third parties. This promises a more innovative initiation of payments directly from bank accounts [2].

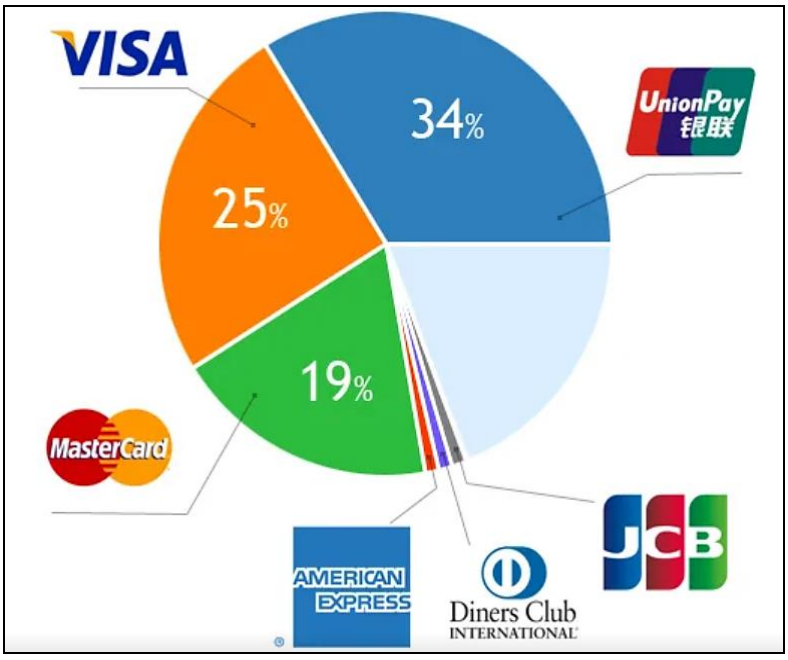

Fig 3: The share of all issued cards in the world [23]

It is important to note that one of the global trends is the use of new technologies to improve the efficiency of regulators. The term SupTech is increasingly used to denote the improvement of existing control and regulatory methods using the most modern technologies for more effective ways to detect and assess risks, collect data and analyze them [17].
Another direction, RegTech, implies the use of innovative technologies by financial organizations to improve compliance with regulatory requirements and risk management, which has a positive effect on the work of banks and allows financial organizations to fulfill internal control requirements with higher speed and minimal costs [17]. Technologies also modernize investments - the market is undergoing profound changes thanks to automated consulting services, algorithmic trading platforms and brokers focused on mobile devices [5]. These tools expand access to capital markets for retail investors on more personalized terms. Robo-consultants such as Betterment and Wealthfront represent a fintech breakthrough in asset management (see Figure 4). Their automated, algorithm-based services create and manage investment portfolios faster and cheaper than traditional methodological approaches. Offering tax loss collection, portfolio rebalancing and diversified investments in ETFs, robot consultants compete fiercely with recognized players in the field of asset management [14].

Fig 4: Trading robots, the largest in terms of assets under management [21]

Continuing the topic, it is worth mentioning stock trading. It has become mobile thanks to brokers such as Robinhood and Webull [32]. Offering zero-fee deals, partial stock purchases and gaming experiences, these platforms have attracted growing interest from retail investors, especially among millennial traders. High-frequency trading algorithms have become an integral part of institutional investors executing large orders on electronic exchanges [28].
Cryptocurrency exchanges such as Coinbase and Binance allow retail investors to trade in digital asset markets [2]. By stimulating the mass adoption of cryptocurrencies, these platforms make buying, selling and storing easily accessible through web interfaces. By integrating functions such as betting, management and decentralized financing, users of the cryptocurrency exchange get new ways to earn money in the digital asset markets [22].
Technological innovations, in turn, open up new opportunities for fundraising and lending - both for enterprises in need of capital and for investors providing it. For example, equity crowdfunding platforms (SeedInvest and Crowdcube) expand startups' access to early-stage fundraising [32]. With their help, retail entrepreneurs can view investment opportunities by directly conducting enterprise-financing operations through offers of digital securities.
Peer-to-peer lending networks like LendingClub and Prosper connect borrowers and lenders directly. Replacing traditional intermediaries, these lending markets rely on online risk modeling in this area [8]. Many investors, not individual organizations, secure loans. This expands access to financing and offers higher returns on debt assets. This approach is changing the way businesses and consumers receive loans [4].
On decentralized borders, initial coin offerings have skyrocketed as crypto-native ways to raise capital for projects. Cryptocurrency tokens represent the ownership of the project or access rights, and not the capital itself [29]. By selling tokens directly to sponsors, early-stage projects have raised billions of dollars with minimal mediation, although there are plenty of risks for non-accredited investors. Decentralized protocols pioneered direct peer-to-peer lending and borrowing of cryptocurrency assets to earn interest [12].
The development of financial technologies, combined with changes in consumer preferences, has increased the competitive pressure on existing banks. Organizations like Chime, N26 and Revolut provide modern banking capabilities designed specifically for mobile users (see Figure 5).

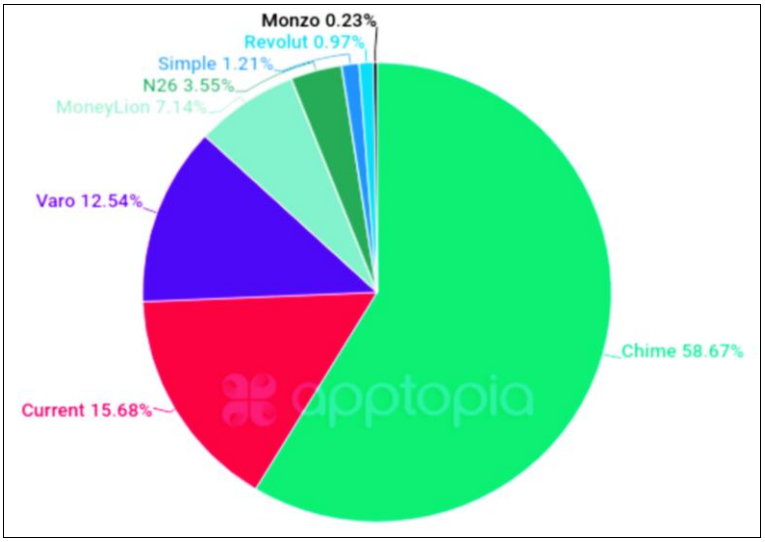

Fig 5: Market share of digital banks in the USA [23]

Having no physical branches (like, for example, Tinkoff), non-banks reduce operating costs and transfer savings to customers through higher interest rates or zero-fee accounts. Key features include early payroll access, built-in budgeting, shared bank accounts, and overdraft advances. Neobanks, in addition, integrate everyday financial services into one interface to enhance convenience. Their integrated approach includes debit cards, bill payments, money transfers, and insurance. As users expect a holistic digital experience, neobanks capable of serving broader financial needs on a single platform will increasingly gain market share [15].

The current players have responded to the competition of non-banks through major digital transformation initiatives. Outdated formations implement cloud data storage; open APIs for developers, aggregate financial data using a policy of launching their own mobile applications [34]. Many, of course, seek to emulate fintech innovations for opening digital accounts, peer-to-peer payments, integrated wallets and savings products with higher returns. Banks now regularly support and incubate fintech startups through corporate venture units. This highlights how embedded fintech technologies influence existing strategies to remain competitive in the digital world [19]. Tencent's WeBank became a pioneer in this field several years ago and offers a case study of technology companies that independently engage in banking: the total assets of the company control $220 billion [33]. Major moves in this industry suggest that convergence between such firms and financial players will only accelerate.

As fintech promises greater access to finance and innovation, it creates new regulatory challenges [11]. Policy makers continue to balance supporting the nascent sector with managing emerging risks as adoption spreads. In addition, most of the business models of fintech companies remain non-banking organizations - they must work within the existing compliance framework, which was not originally intended for digital finance [2]. For example, cryptocurrency exchanges, like banks, must implement strict "know your customer" (KYC) and anti-money laundering (AML) protection measures [16]. However, major data leaks on exchanges highlight cyber risks as adoption grows. As for payments, technology giants like Amazon, Apple and Google own a large infrastructure of digital wallets, becoming new systemically important players (see Figure 6).

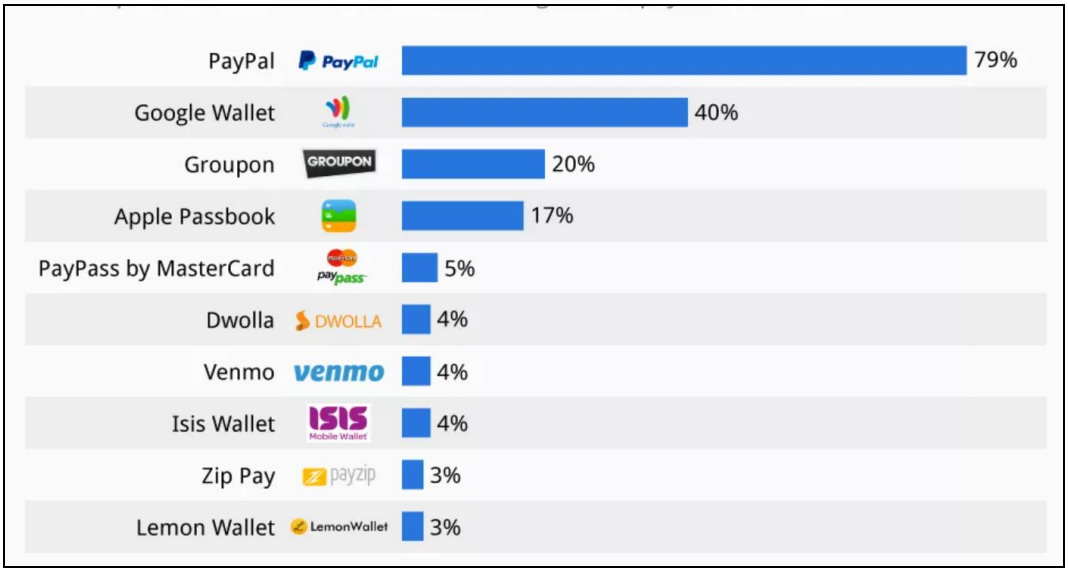

Fig 6: The largest digital wallets in the world [30]

As users flock to super applications, worldwide attention to data privacy and competition is increasing. Consumer lending platforms balance credit risk modeling using alternative data and accusations of discrimination [7]. Equity crowdfunding laws aim to facilitate access while protecting unsophisticated investors from huge losses. Setting the appropriate rules, given the rapid pace of change and the disruptive nature of financial technology, remains an ongoing process. Policy priorities regarding data security, financial stability, equal playing field and consumer protection will determine the final rulemaking.

Most banking regulators have implemented "test and learn" sandboxes, allowing approved FinTech companies to experiment on products. In 2016, the UK Financial Regulation Authority pioneered the creation of regulatory "sandboxes": since then, more than 90% of sandbox firms have entered the market on a commercial basis [10]. The temporary elimination of bureaucratic red tape allows more experimentation with business models, improving access and quality of finance.

The economic impact of Fintech is growing due to the promotion of wider access to financial resources and increased efficiency [21]. The transformational shift towards digital financial services creates significant value for the payment, investment, credit and banking infrastructure. Recent studies show that improved financial technologies accounted for about 15% of the total economic growth created worldwide between 2014 and 2019 [24].

Emerging market economies and developing countries with large populations not covered by banking services can benefit enormously from the inclusion of a significant number of participants. Innovations in this field have already saved global consumers more than $200 billion annually in commission fees as of 2021 [20]. New credit conditions contribute to income growth, asset accumulation and job creation for individuals and businesses throughout the system in the long term [24].

Active activity in the field of financial technologies creates positive side effects for the economy. Fintech is driving broader technological innovations, including semiconductors, cloud infrastructure, mobile devices, analytics, cybersecurity, and software [17]. Accelerating R&D in these areas leads to positive externalities for the NTR as a whole. The transfer of financial technology talent and additional activities also strengthen regional technology ecosystems. Socially, consumers benefit from democratizing access to transparent financial products that conveniently meet diverse needs. Promoting wider access to such services for disadvantaged groups creates positive socio-economic effects [2]. However, advances in the field under study also highlight concerns that workplace automation will eventually displace traditional sector workers [18].

Policymakers ultimately seek to find the optimal balance between effectively managing the risks of financial technologies and harnessing their potential to ensure sustainable and equitable growth [13]. As their distribution grows worldwide, the benefits now far outweigh the costs. However, the proper promotion of innovation at the heart of responsible technology management remains key.

Conclusion

The analysis highlights the profound digital transformation-taking place in global financial markets, encompassing payments, investing, lending and banking. A huge range of new products, platforms and business models are emerging, supported by advances in cloud computing, data analysis, mobility, artificial intelligence and blockchain technologies. Existing institutions compete with various revolutionary FinTech companies that use these developments to provide an enhanced digital experience that meets the expectations of modern consumers in terms of convenience, personalization and accessibility [1]. The consequences are very diverse. Consumers benefit from cheaper, faster, and more tailored financial services that can meet more inclusive needs. In particular, groups of the population in developing regions experiencing a lack of banking services now receive expanded formal access, which increases financial stability.

It should be noted that digital transformation carries not only potential opportunities and advantages, but also significant risks and threats. Risks associated with issues such as privacy, stability, inequality, and workplace automation pose increasing challenges as implementation accelerates [7]. To eliminate them, it is necessary to harmonize the regulatory framework in the field of financial technology regulation, especially in terms of cybersecurity and data security. It is important to emphasize that the sustainable development of the financial sector requires innovative drivers of economic growth in general.

The introduction of financial institutions into practice, the formation of economic relations between financial market participants, and digital technologies is accompanied by an increase in the level of risks generated both in the course of the activities of market participants and in the course of the external environment. Good governance, combining oversight with sector support, remains vital for the sustainable realization of economic benefits. Policy priorities include fair digital competition, cybersecurity, financial stability monitoring, targeted incentives and cross-border coordination. Partnerships between government, academia and industry stakeholders, in turn, are crucial for informed and flexible responses, as the spread of technology in finance continues at a rapid pace [18].

Fintech innovations will make tremendous progress in expanding access, efficiency and value in financial markets [19]. If used responsibly, it can contribute to a more sustainable and inclusive economy around the world. Achieving optimal results requires active management that promotes innovation within reasonable limits of stability and consumer welfare - an evolving feat that requires coordinated political foresight in the face of rapid technological change [17]. However, effective management of this transition promises significant socio-economic dividends.

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