

Alternative Finance in the New Digital World – Some Regulatory Challenges

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Abstract

The article analyzes the role of Fintech and BigTechs as alternative financial institutions. It notes also the emerging of some conceptually new mechanisms for the creation and distribution of financial products and services based on platform solutions and in the absence of a centralized intermediary institution. In this context it is discussed whether alternative finance does not create a new boundary problem and what related risk are to be tackled. Arguments are given in support of the need for complex, integrated and high-tech supervision of this increasingly popular segment of the financial system and complex risk categories are proposed.

Keywords: FinTech, BigTech, Financial Regulation

JEL Code: G18, G28, O30

Introduction

The turbulent social, geopolitical and economic events that we have been witnessing on a daily basis seem to be pushing to the background of public attention another trend related to the gradual subjecting of the financial intermediation industry to an increasingly stronger dependence on innovations in the field of information and communication technologies. The emergence of various technological innovations catalyses various processes, leading not only to its very strong digitalization, but also to the transformation of large technological companies (*BigTechs*) into competitors of classic financial intermediaries. Along with this, the innovative small, heterogeneous, but also very flexible creators of financial technologies, united under the general name *Fintech*, also gain significance.

Often founded as technological start-ups, they disrupt the usual perception of the strict regulatory barriers to starting a financial activity, and the technological innovations they implement often have the effect of disruptive technologies compared to traditional banks and non-banking financial intermediaries. The definition given by the Organization for Economic Cooperation and Development to fintech is also along these lines – it is associated with the development of new business models and products based on these technologies and especially on digital platforms and processes (OECD, 2018, p. 10). For its part, the Financial Stability Board has defined financial technologies as a set of technologically enabled financial innovations that are linked to specific applications, processes or products and have a significant effect on the financial markets and institutions in the provision of financial services (FSB, 2022). According to another definition, financial technologies restructure public understanding of financial and banking services on the basis of a new business approach, products and services (Bulgarian Fintech Association, 2022).

Some aspects of the regulatory framework related to efficient supervision and ensuring effective compliance by alternative financial products and institutions can be discussed in this respect. As discussed below in the text, the category of “alternative finance” covers a broad range of financial activities carried out by Fintechs and BigTechs. Moreover, most of them are associated with a global virtual presence, providing access to individual national markets characterized by different regulatory regimes.

The purpose of the study is to highlight individual key challenges related to the efficient regulation and supervision of this emerging and booming financial segment. Its achievement includes finding possible answers to the following *discussion points*: What exactly does the category of “alternative finance” include? Have new levels of interdependence and dependence emerged within the new ecosystems? How are the emerging risks to be tackled? Is a new regulatory

approach needed in this area or are existing supervisory practices sufficiently effective?

Scope of alternative finance

In general, the category of *alternative finance* is associated with all mechanisms and channels operating outside the traditional financial system and in the online environment to create financial products and services. According to the Cambridge Centre for Alternative Finance (CCAF), alternative finance is an amorphous term that includes online digital financial activities that have emerged outside of incumbent banking systems and capital markets (CCAF 2021, p. 30)¹. In a broader sense, the scope of alternative finance can comprise various types of transfer operations, lending and capital raising options, wealth management and personal finance services, investment solutions for individual and institutional clients, etc., when these activities are carried out by non-banking and non-traditional financial institutions. A similar classification can also be made from the point of view of the functions performed by these providers, namely – payments, lending, wealth management and blockchain technologies (decentralized finance, DeFi). Choosing the wider scope for the classification of activities in the scope of alternative finance, we can conclude that to a large extent it comprises the areas of *fintech*². While fintech is perceived more in an institutional aspect, the alternative financial solutions it creates should be treated as an independent category. This is also necessary due to the intervention of the technological giants united themselves under the collective term of *BigTechs*.

A differentiation should be made here from the category of *digital finance*. It characterizes the overall impact of innovations in the field of information and telecommunication technologies on the financial industry. All financial products, business models and processes undergoing digital transformation can be gathered together under this name, including a number of processes related to the activities of classic financial intermediaries. It can be pointed out that while alternative finance should be seen more from a functional perspective, digital finance stands out as its technological dimension.

A unique ecosystem is formed in this way including two main groups of participants: traditional financial institutions (banks, stock exchanges, insurance companies, etc.) and emerging financial service providers (fintech and BigTechs), positioning themselves in two categories – digital and alternative finance. It is worth noting that there is a strong interdependence between the individual elements of this environment. For example, services created by fintech, i.e. within the scope of alternative finance, are “copied” at some point by traditional financial institutions. Thus alternative finance should also be seen as an innovative generator in relation to traditional financial intermediaries. Another key level of interdependence of a purely technological nature can be highlighted between the spheres of alternative and digital finance. It is provoked by specific technological innovations (e.g. blockchain) that are initially adopted by the alternative finance segment, but are subsequently also implemented by traditional financial institutions and even by supervisory agencies³.

Some of the more significant drivers stimulating the entry and growth of alternative online channels for the creation and distribution of financial services by fintech and the big technological

¹ CCAF is a leading scientific organization that, since 2015, has been researching the development of the alternative finance market related to peer-to-peer lending (P2P) and crowdfunding. It publishes regular reports detailing the research in this field in partnership with a global network of scientific organizations. The CCAF reports are freely accessible at the following internet address: <https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/>.

² However, it should be noted that regulatory technologies (RegTech) and sometimes supervisory technologies (SupTech), which do not actually produce new financial products, but contribute indirectly to their creation and distribution, are often associated with fintech.

³ Some examples in this respect are the “One Pay FX” projects of the Spanish banking group Santander, the “Marco Polo” initiative to develop a trade finance platform of 30 global banks, the “Komgo” consortium between the Swiss UBS and 15 other global financial institutions, the DLT transfer capability developed by the SWIFT payment system.

companies can be systematized into the following few categories. The achievements in the field of information and communication technologies of recent years can undoubtedly be mentioned *first*. For example, artificial intelligence, blockchain, cloud computing, the new possibilities for processing large data sets, the virtual reality and biometrics are just some of the examples of innovations stimulating the emergence and development of entirely new financial segments. The absence or presence of relatively lower regulatory barriers compared to those existing for the traditional financial sector can be noted *in the second place*⁴. This kind of deregulation compared to alternative financial product creators also stimulates them to achieve additional cost optimization in addition to the optimization obtained on the basis of their positioning entirely online and the ensuing much more optimized staff structure, and hence the lower operating costs⁵. A *third* driving factor of development in this direction stems from the activity of BigTechs. These large technology companies have huge customer bases, many times larger than those of traditional financial institutions. On the other hand, the attracted global clientele allows BigTechs to create their own risk assessment models comparable in effectiveness to those of traditional banks. In addition, tech giants develop their own risk management solutions based on artificial intelligence and big data processing. The availability of the necessary technological infrastructure ensures the implementation of reliable online platforms that guarantee advanced methods for initial identification and authentication of customer identity, as well as connectivity with all major payment systems.

New boundary problems

With the outbreak of the global financial crisis in 2007-2008, a number of weaknesses in the regulatory practices pursued so far became apparent. One of them concerns the identification of segments of the financial system falling in the intermediate zone between strict regulation and the practical absence of regulations. Appropriately defined by Charles Goodhart as a *boundary problem*⁶, this situation can be traced to the possibilities of deliberate outsourcing of financial activities to segments with weaker or even absent regulation. The most striking example of a boundary problem since the years of the last financial crisis is shadow banking. As is well known, the shadow banking system encompasses various types of financial institutions that perform credit intermediation activity on a very large scale without being regulated in the same way as traditional banks. This term can also be used to describe the performance of unregulated financial activities by otherwise regulated financial institutions⁷. If during the global financial crisis the backbone of the shadow banking system consisted of institutions such as hedge funds, investment banks, non-banking financial companies, etc., then, from a modern perspective, the question could be where alternative financial service providers such as fintech and BigTechs stand today. In short, aren't these institutions the new shadow banks?

Of course, a direct comparison based on quantitative indicators of the type of assets, market

⁴ As an example, the required minimum levels of capital in the EU when starting a banking activity - €5 million, for electronic money companies - € 350 thousand and for payment institutions - up to € 125 thousand (depending on the services offered by them).

⁵ In some respects, there may even be "circumvention" of the regulations for traditional financial sector by using an alternative fintech model.

⁶ See: Goodhart (2008).

⁷ A number of regulatory initiatives were undertaken in the years following the global financial crisis of 2007-2008 to regulate shadow banking. In the US, this happened with the adoption of the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010. For its part, in 2013, the European Commission created a road map outlining the main steps to limit the systemic risks caused by the activity of shadow banks when integrated into the traditional banking system followed by Regulation (EU) 2015/2365 on transparency of securities financing transactions and of reuse.

capitalization, volume of managed funds, granted loans, etc., would clearly show the insignificantly smaller size of alternative finance⁸. On the other hand, the establishment of multidirectional relations between fintech, BigTechs and traditional financial intermediaries triggers a discussion whether they have brought about new domains of the mentioned boundary problem, but already with the active participation of other non-financial industries and especially that of information technology.

A study by the Financial Stability Board made an overview of the financial activities of eleven of the largest BigTechs as of 2019⁹. It shows that they all provide payment services based on virtual payment systems and digital wallets, eight provide various forms of crediting and short-term loans, five – the possibility of using payment services, seven – insurance products, and three – asset management (Financial Stability Board, 2019a, p.14). What is interesting here is the cooperation with traditional financial institutions. For example, the payment services of almost most of the surveyed BigTechs have integrated with the networks of major card operators Visa and Master Card (for Google Pay, Amazon Pay, Messenger Pay, Apple Pay, Samsung Pay and Microsoft Pay), but also with other virtual payment systems (e.g. Baidu Wallet and PayPal). It makes an impression that insurance products have joined hands with traditional financial institutions – for example the partnership between Amazon with JPMorgan Chase and Berkshire Hathaway in health insurance, the partnership between Apple and Allianz in cyber risk insurance or the joint venture formed between the Chinese Baidu with Allianz and Hillhouse Capital.

Such forms of cooperation with the traditional financial sector can also be found in smaller fintech companies. The second payment directive of the EU (PSD 2) acted as a catalyst in this process. The open banking feature it introduced enables third parties (in most cases small fintech companies) to develop their own application programming interfaces (APIs) for accessing bank accounts (Account Information Service) and initiating payments from them (Payment Initiation Service). This regulation helps to confirm the role of the so-called *neobanks* – a broad category of quasi-banking institutions operating in an online environment. Unlike the *challenger banks* that appeared a little earlier, which are fully licenced to perform banking activities, but operate entirely virtually, neobanks can operate as payment institutions or electronic money companies. According to data from Zion Market Research, the predicted compound annual growth rate of both types of virtual banks for the period 2019-2026 amounts to 46.5%, fuelled by innovations such as artificial intelligence, the Internet of Things and big data processing (Zion Market Research, 2019).

Recently, there has been an increased interest from traditional banks implementing products based on *embedded finance* (KPMG, 2022b, p.7). This integration of purely financial products (especially those related to payments, but not only) into digital interfaces and their subsequent “connection” with various digital wallets, accounting programs, mobile applications, online trading platforms, etc., can be seen as a natural extension of activities such as online shopping, inventory management, etc. Its specific applications often consist in client transaction and deposit accounts opened by online merchants, the possibilities for money transfers between different mobile or online wallets, prepaid cards, as well as the possibilities for granting commodity credit (Dresner et. al., 2022). On the other hand, the offering of such financial solutions by unregulated providers necessitates supervisory intervention as soon as possible, especially in terms of consumer protection (KPMG, 2022b, p.7).

⁸ According to various estimates, the global volume of shadow banking in the years during and immediately after the global financial crisis varies between \$60 and \$100 trillion. However, another observation can be made here. Comparing today’s market valuations of the largest banking groups with BigTechs, it becomes clear that the market capitalization of the latter exceeds several times that of credit institutions. What’s more, some of the largest BigTechs have managed to reach and even surpass the \$1 trillion mark.

⁹ Google, Amazon, Facebook, Apple, Samsung, Microsoft, Vodafone, Mercado Libre, Alibaba, Tencent and Baidu.

While the aforementioned variations of alternative finance are rather technological and functional optimizations of otherwise traditional financial solutions, a conceptually different approach to digital finance is asserting itself with the advent of *crowdfunding* and *peer-to-peer (P2P) lending* platforms, resembling traditional banking intermediation, but without the presence of a credit institution acting as an intermediary. Based on the direct connection between investors (donors) and borrowers through an online platform, both mentioned digital lending options use a business model based on raising small amounts of money from a large number of people. Originating in the form of Internet campaigns aimed at attracting financial resources through donations or in exchange for some form of remuneration and/or voting rights to support initiatives for specific purposes, today they can be grouped into a number of variations¹⁰. For example, *investment crowdfunding* includes activities such as equity crowdfunding, debt-based crowdfunding, revenue/profit sharing, real estate crowdfunding, Initial Coin Offering (ICO), etc.¹¹

In shared lending, borrowers can apply for a loan directly through the P2P platform (an option known as *direct* or *marketplace lending*) or have their existing loans (provided mainly by non-bank lenders such as consumer finance companies) “listed” on the P2P platform. Specific variations of P2P lending are P2P Marketplace Consumer Lending, P2P/Marketplace Business Lending, and P2P/Marketplace Property Lending. Unlike a traditional bank loan, in this case the credit risk is shared among the participants in the platform and is “broken down” into separate small parts, even if the loans are not repaid, the losses for the investors are limited to their proportional participation. Some platforms offer a possibility of constructing an individual portfolio and selecting parameters such as the type of loans, maturity, credit rating, currency, country, etc. The high returns that these platforms offer to investors (the average annual return of some of these platforms exceeded 15% specifically in the period when interest rates on bank deposits gravitated around zero) undoubtedly lead to an increase in their popularity. The virtual transformation of funds raised through the platforms into a credit resource largely resembles the transformation of deposits into loans typical of credit institutions. Unlike the legally guaranteed bank deposits, investments in P2P platforms do not have a similar guarantee mechanism. It is reasonable to question in this respect the extent to which the individual platforms have reliable mechanisms to provide liquidity and reserve funds with which to secure their functioning during market instability.

Another segment of alternative finance is the so-called *decentralized finance /De-Fi/*. Activities based on Distributed Ledger Technology (DLT) fall into this category. The creation of Bitcoin, the first cryptocurrency, in 2009, gave rise to a system in which, as of November 2022, over 21,700 individual cryptocurrencies and crypto tokens with a total market capitalization of over \$831 billion have been operating, traded on 524 exchanges¹². What is characteristic of all crypto assets is their decentralized mechanism for creating and validating transactions that does not require a centralized institution (central bank) responsible for monetary emission. In practice, the ecosystem of decentralized finance is a self-regulating mechanism with a very high level of security where all rules necessary for its functioning are initially embedded in its program code. On the other hand, the authentication of the security of individual operations takes place with the full consensus of all members of the network by solving complex mathematical algorithms. At first glance, the existence

¹⁰ The first crowdfunding project is associated with the British rock group Marillion, which in 1997 organized an Internet campaign to raise funds to organize its overseas tour in the United States. In 2003, the specialized website ArtistShare was developed to finance the creation of digital audio recordings of various musical groups. The site later grew into a fundraising platform for a variety of projects related to music, film and photography.

¹¹ On the other hand, *non-investment crowdfunding* includes campaigns related to charity (donations-based crowdfunding) and campaigns in which investors in a given project receive various rewards (rewards-based crowdfunding) – for example, the specific product or service, the creation of which is financed by them, an opportunity for pre-orders, lifetime subscription for updates, etc.

¹² According to data from the leading crypto market statistics site <https://coinmarketcap.com>, up-to-date on 19.11.2022.

of a fully automated way of guaranteeing security renders the need for an external regulator meaningless. As will be discussed below, this system is characterized by quite a few risks. Interesting is the fact that the DLT technology is gradually extending its application, for example in smart contracts, in the creation of secure shared databases between regulators and financial institutions.

Covid-19 and the lockdowns and the forced work from home caused by the pandemic also led to a significant increase of online transactions, including those falling into the segment of alternative finance. A study by CCAF, World Bank and World Economic Forum on the subject states that part of the government aid to deal with the consequences of Covid-19 reached the affected parties precisely through the channels of alternative finance. Digital payments, online lending and Insurtech are among the most used alternative financial providers by governments. The technology providers developing mechanisms for online identification also have a significant role in this process. In addition, more than half of the fintech companies interviewed in the aforementioned study stated that their participation in government support programs benefited them and led to an increase in their turnover and income (CCAF, World Bank and World Economic Forum 2022, p. 40)¹³.

The risks in fintech and BigTech – financial or technological?

If the above-mentioned aspects of interaction between financial activities and technology outline the framework of new boundary areas in an institutional and functional aspect, then the way of handling the resulting *specific risk categories* should also be discussed. According to some opinions, the risks ensuing from the strong integration between technology and finance may not be fully covered by the existing regulatory approaches that are characterized by being more focused on individual entities or specific activities rather than on risks arising from the substantial level of this interconnectedness (Crisanto et. al., 2021, p. 3).

The two annual rankings of the leading risks to financial regulation prepared by KPMG and Deloitte attest to a kind of interdisciplinarity in this regard. As many as six risk categories among the top 10 risks for 2022 according to KPMG can be related to the activity of alternative finance. More specifically, these are: crypto and digital assets (#3 in the ranking), platforms and behaviour (#4), cyber security and information (#5), fraud and financial crime (#6), cloud technology and third-party dependence (#8) and technological sustainability (#9)¹⁴. Deloitte's ranking for 2022 takes into account the significant volatility of crypto markets, and the insufficient customer protection in this area¹⁵. For its part, a World Bank study presents the most significant risks associated with three of the alternative finance segments, namely P2P lending, equity crowdfunding and initial coin offerings (ICOs). The specific risks here are: fraud, risk of capital losses for investors, use of platforms for criminal purposes and money laundering, risk of over-indebtedness of fundraisers, exposure of investors to low-value products, misuse of customer data, regulatory arbitrage and inability to liquidate and/or monetize the investment (World Bank and CCAF, 2019, p. 59).

It is also reasonable to consider the issue of personal data protection in the context of alternative finance. The Bulgarian Financial Supervisory Commission notes in the strategy for monitoring financial innovation in the non-banking sector (2021-2024) that the use of customer data by Fintech raises the question of how supervisors should approach consumer rights in the context of

¹³ The same study also notes some activities provided by fintech and supporting regulatory activities. Some of them are: online onboarding and E-KYC, cyber security and fraud prevention instruments, simplified customer verification, business continuity solutions, etc. (CCAF, World Bank and World Economic Forum 2022, p. 40).

¹⁴ For more detail see: KPMG (2022a).

¹⁵ For more detail see: Deloitte (2022).

personal data protection regulations. According to the cited study, supervisors should consider the potential to promote data sharing between different actors in the provision of financial services while ensuring equal access to data to the Fintech industry in order to achieve a healthy level of competition and innovation. Furthermore, there is also the question of whether the sharing of data of new participants will not create new risks (Financial Supervision Commission, 2021, p.13).

According to another view, cyberattacks nowadays develop at the same speed as innovative technologies and processes. This also gives rise to enormous risks for the organizations, posing a danger that they may even be unable to recover from a major attack. The immediate response to these potential risks is the accelerated outsourcing of processes to the cloud environment observed in 2021. Additionally, there is also an increase in investments for cyber defence and cyber resilience, as well as for removing breaches, for testing vulnerabilities and ensuring basic security hygiene in order to counter the risk posed by the rapid entry of innovations (KPMG 2022b, p.21).

Even a cursory look at some current regulatory challenges in this area gives sufficient grounds to raise the question of diversifying the risks that accompany the activity of alternative finance. The analysis in this direction would undoubtedly require a complex and equal treatment of a wide range of factors according to the model of *regulatory neutrality*. If we borrow this technique from the field of macro-prudential regulation, according to which a criterion for enhanced supervision should be not the size, but the systemic importance of an individual financial institution, then a conceptual framework uniting a wide range of indicators of importance should also be defined for alternative finance. The formulation of such preventive macro-environment would contribute to setting up a sustainable mechanism to counter events such as the bankruptcy of the German fintech giant Wirecard in 2020 after establishing financial abuses and billions of missing funds, the scandal with the suspension of trading in the shares of the company GameStop from the online trading platform Robinhood in 2021, the collapse of the crypto exchange FTX in 2022, and the increasing data of abuse and fraud in cryptoassets.¹⁶

In this context, an analysis of the risks within the domain of alternative finance can be proposed through an assessment based on groups of indicators put in individual *complex risk categories*. Each of them could integrate the most significant factors related to the emergence of some form of instability – for example, financial, technological or systemic. For example, factors such as high market volatility, risks in initial coin offerings, insufficient liquidity of P2P and crowdfunding platforms, etc., can be added to the traditional credit, liquidity, currency, interest, etc. risks falling within the scope of financial risks in this area. Another risk category could encompass all *technological aspects* related to cyber security, ensuring business continuity, achieving technological sustainability, reliability of the used and implemented technologies, etc. Ensuring effective *compliance* can be considered as another independent sphere that includes indicators for establishing the risk of misconduct, misuse of personal data, money laundering, financing of terrorism, violation of embargoes and sanctions regimes, etc. A separate category of systemically important risk factors, following the model of Global Systemically Important Financial Institutions (G-SIFIs), could group the indicators that designate the level of systemic and network interconnectedness of the relevant ecosystem. The presence of growing dependence on external providers in terms of certain technologies - e.g. cloud services – could be added here. According to the Financial Stability Board, balancing the risks of third-party dependencies is a complex task. The hypothetical bankruptcy of a key third-party provider could theoretically generate financial instability, especially if this risk has not been adequately managed at company level (Financial Stability Board, 2019b, p. 5).

¹⁶ According to Cahinanalysis, the total value of cryptocurrency fraud in 2021 exceeded \$3.2 billion with registered 251 hacks of crypto exchanges, DeFi platforms and private crypto wallets (Chainanalysis, 2022).

Of course, such complex monitoring of any segment of the sphere of alternative finance would represent a significant challenge, especially in segments such as De-Fi. To the extent that the reviewed field of alternative finance can be perceived as a kind of mix between technological innovation, traditional financial activity and multidirectional vectors of partnership and cooperation, the accompanying risks should also be treated together.

The new agenda of the regulatory debate

At first glance, the phrase “regulation of innovation” would provoke very divergent opinions. On one side in such a debate would be the extreme supporters of the free market, for whom bringing any activity within the scope of financial supervision would represent a form of market failure¹⁷. The other extreme point of view would be advocated by the supporters of the thesis, according to which no self-regulatory initiatives should be allowed in the modern financial system, and where there are existing regulations, they should be constantly renewed and expanded. This position is gaining importance and public support as a result of both the series of failures (institutional, product and regulatory) that led to the global financial crisis, and the many notable cases of misconduct committed both by individual financial institutions and their employees. The manipulations of the London Libor, the abuse by traders such as Kerviel (Societe Generale), Adoboli (UBS), the Madoff pyramid are all arguments in support of stricter supervisory activity.

In both cases, the distortion of competition is a fact. The absence of regulation creates an unfair advantage for the new technological providers of financial products compared to the increasingly strictly regulated traditional financial institutions. In the opposite situation, with the alignment of the supervisory requirements for all participants in the system, the resources of small fintech companies to ensure regulatory compliance would be sufficient in most cases. The entry of BigTechs into the financial sphere further complicates this process. Relying on their huge customer bases and technological superiority, they also generate new levels of information and technological asymmetry¹⁸.

The emerging new partnerships and relationships between individual old and new participants, based on diverse platform solutions, technology sharing and customer segments, should not be overlooked. Regulators should therefore continually commit to a growing number of responsibilities, including a comprehensive sustainable finance agenda, regulation of cryptoassets, AI and cloud technologies, etc. It should be noted here that the supervisory agencies also experience other problems such as limited resources and difficulty retaining or replacing their existing staff (Deloitte 2022, p.17). Perhaps this is one of the incentives for their growing activity in deploying proprietary supervisory technologies (SupTech) developed within regulatory sandboxes and accelerators where they partner with fintech and RegTech companies. From this point of view, Auer’s concept of embedded supervision, based on the sharing of databases between regulated entities, government and supervisory authorities, based on DLT, should not be considered only as a theoretical possibility¹⁹. A prominent example of development in this direction is the cross-border

¹⁷ An example in this regard is the situation with China, which dominated the world market of online alternative financing until 2018. However, the regulatory changes in the country have caused a significant decline in volumes and global market shares of the Chinese market, which amounted in 2019 to 48% of the global volume, and in 2020 it shrank to 1%. Logically, this also leads to a contraction of the global volume in this segment by 42% in 2019 and by another 35% in 2020 – from \$304.5 billion in 2018 to \$176 billion in 2019 and \$114 billion in 2020 (Ziegler et. al. 2021).

¹⁸ They also fill market niches, such as provision of access to basic financial services for people without access to the traditional financial system. For example, the M-PESA platform owned by Vodafone provides access to financial services (transfer operations, microcredits and microinsurance) through a mobile application to over 51 million Africans.

¹⁹ For more detail see: Auer (2019).

DLT financial network Global Trade Connectivity Network (GTCN), operated by the monetary authorities of Hong Kong and Singapore (Hong Kong Monetary Authority, 2022).

It is evident that the contemporary landscape in which financial regulators operate is characterized by blurring of the clear lines between the types of individual financial product providers. There are also the first dedicated legislative initiatives to regulate operations with virtual assets. More specifically, the recently adopted European Markets in Crypto-assets Directive (MiCA) can be mentioned here. In parallel, in 2022 the Council of the EU and the European Parliament announced the agreement on the Digital Operations Resilience Act (DORA) – creating a regulatory framework to ensure the operational resilience of digital technologies used in the EU. Counteraction to a wide range of cyber risks is part of its scope. The unified European supervisory authorities (EBA, ESMA and EIOPA) are to develop their own technical standards that will become mandatory for all financial services institutions, including those operating in the alternative finance segment (Council of the EU, 2022).

Conclusion

To the extent that the integration of the traditional financial sector with the sector of information technology requires a combined study of the possible consequences of this form of interaction, it is insufficient to use only traditional qualitative and quantitative indicators to measure size, profitability, stability, competitiveness and other characteristics of the modern financial system. These indicators should be supplemented with an analysis of the interdependence between the traditional financial system, fintech and BigTech, and the comprehensive study of the interrelationships between them could be perceived as a necessary addition to the traditional research tools in this field. The possible comprehensive approach suggested above to the different risk categories can be considered as an option in this direction that could be further developed and integrated within the model for testing the sustainability of the alternative finance segment.

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