

The Analysis of Blockchain Technologies Usage in Global Financial Markets

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Abstract. This article considers the evolution of the blockchain financial technology, approaches to its regulation and verification, conceptual approaches to verifying new high-tech solutions related to financial instruments and practical recommendations based on the prospect of integrating blockchain financial technology into national payment systems and international clearing and calculations. The following questions are analysed in the article: practical applications of the blockchain technology in global financial markets; the digital currencies introduction in different countries; current and modern blockchain projects; assessing the financial effectiveness of modern blockchain projects; fintech risk in the financial era. In addition, the author analysed the modern trends in the global financial market digitalization through the introduction of decentralized blockchain database networks into financial services as well as identified ways to improve them.

1 Introduction

Blockchain is considered as a significant disruptive innovation. Researchers have high hopes for blockchain and its application outside the financial sector since this technology will greatly simplify transactions. The blockchain technology can cause important and profitable changes to financial markets in case if it is applied correctly.

Companies investing in crypto economics are currently split between cryptocurrencies and blockchain technology. For instance, the leaders of the main American online store Overstock enthusiastically support Bitcoin. Internet services holding Alphabet and financial services holding JP Morgan Chase are blockchain enthusiasts. However, it is important to note that cryptocurrency enthusiasts are also transferring their investments from cryptocurrencies to technologies.

Most sources represent the approaches and interpret blockchain technology as a decentralized database which stocks are not connected only to a joint server but decentralized. The database stores a growing list of ordered records called blocks. Each block is connected in a chain by a unique number and each block contains all the data in the

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chain starting from the first block. Blockchain allows to send any data or events from any spot to the blockchain using a key generated by the cryptographic algorithm [1, 2].

Blockchain is a virtually distributed ledger that allows to register transactions without the need to attract financial partners or intermediaries.

Blockchain technology has the potential to transform not only financial markets, payments, financial services and finance but also education, healthcare, logistics, land registration, state and corporate document management [3]. Blockchain technology facilitates all human interactions coordination and helps to organize joint interaction and work with obviously less effort, however with the greater efficiency and in significantly increased pace. The authors see great potential in the blockchain development and application in areas where work can be greatly simplified.

2 Materials and Methods

The author used methods of comparative analysis and synthesis, classification, categorization and expert assessment, clustering and empirical research, comparative methods and content analysis, economic statistics and econometric methods. The theoretical basis of the study is the provisions of scientific publications by foreign and local scientists devoted to the development of blockchain technologies for decentralized accounting in the financial market, scientific articles, materials, collections of articles and conference reports on the financial technology development based on digital technologies and legal understanding of blockchain networks operating in the financial market.

3 Results and Discussions

According to ResearchAndMarket, the global blockchain technology (BAAS) market reached 420.5 billion euros in 2021.

Analysts do not point a tendency comparing to 2020 but note that the cost of this decision will grow. The limitations of the BaaS model in terms of the analytics market development are explained by the fact that cloud blockchain technology effectively implements a certain degree of general centralization since executable blockchain transactions are managed in escrow mode. However, it is more appropriate for many companies to reduce the cost of building their own omni-channel technology in order to offer cloud services. If a company already has a blockchain-based solution which is right for its business, there is no need to change anything. Unless this company can rely on the other ones to manage the network.

According to the market research, BaaS solutions are changing, transforming the financial sector as banking organizations and other financial institutions are actively searching for practical blockchain application.

The BaaS market is the fastest growing in the Asia-Pacific region only due to blockchain projects in the public sphere.

Analysts name the number of corporations such as Microsoft, Apple, HPE (Hewlett Packard Enterprise), IBM, SAP (SAP SE), Stratis, Amazon Web Services, Oracle, Huawei, Blockchain and Pay Stand as leaders on the blockchain-as-a-service market.

BaaS is a solution that allows users to initiate, host and run their own blockchain applications called smart contracts and blockchain functionality on a cloud platform. The cloud provider directly monitors all tasks and activities necessary to maintain and operate the infrastructure. It is noted that in the middle of October in 2020 PwC published a new analysis due to which it is seen that blockchain technology will contribute to the growth of the global economy by \$1.7 trillion by 2030. This analysis is part of a series of PwC studies

that look at scenarios for the introduction of new technologies and their economic impact. PwC believes that the blockchain solution has the potential to help many organizations transform and rethink themselves in the new environment. [4].

PwC identified five key applications for blockchain and assessed its potential for value creation through financial analysis and industry research. These key areas are payment monitoring, financial sector payments and services, identity management, contracting and dispute resolution and customer user interaction process [5].

The PwC report also noted that blockchain technology could be applied in industries ranging from base industry, mechanical engineering to fashion brands. Analysts note that blockchain is especially useful in such industries as finance, government, education and healthcare where, according to PwC estimates, revenues will increase by \$28.5 billion by 2030 which will benefit a wide range of companies including wholesale and retail, telecommunications and media, business services [6].

Blockchain technology is currently quite widespread in many countries around the world (Table 1).

Table 1. The digital currencies and blockchain application in different countries

№	Country	Characteristics
	Australia	The state completely adapted the local legislation for registration of ICO acceleration. The government of Australia took necessary steps for legalization of digital currencies. It became one of the first countries which passed official rules for primary token offers.
	Estonia	Cryptocurrencies are considered alternative currencies in this country; it is one of the few European countries that welcomes ICO. The country has created favourable opportunities and conditions with a flexible tax regime for international IPO. The authorities provide benefits and incentives for these projects' implementation - ICO registration in Estonia is not under VAT.
	Argentina	One of the most favourable environments for cryptocurrency companies. Blockchain companies are registered in this country with the full government support and the approval process is relatively fast.
	Spain	It is quite an interesting opportunity for cryptocurrency entrepreneurs who are looking for a better jurisdiction. Registering an ICO in Spain in 2021 will not only allow cryptocurrency companies to launch relatively quickly but will also give them the opportunity to take the advantage of governmental incentives created for fintech companies. All cryptocurrency transactions are free from VAT in Spain.
	Belarus	As well as Argentina, this country welcomes the initial coin offering industry development. ICO registration will allow cryptocurrency exchanges to operate in 2023. Local fintech companies will also be able to register as operators of digital currency exchanges and mining. The main regulator with jurisdiction is the Law on the Development of the Digital Economy.
	New Zealand	Registering an ICO in New Zealand in 2021 is an ideal opportunity for the local government to amend legislation to accelerate the cryptocurrencies accepting and create a favourable environment. FinTech companies will receive official legal status, fiscal benefits and special conditions and incentives for development in this country. Licenses for cryptocurrencies are issued by the FMA (Financial Market Authority of the State of New Zealand).
	Czech Republic	The Law on the Development of the Digital Economy.
	Singapore	In addition to well-established regulators and a favourable tax regime, there is the number of local crypto companies in Singapore. The following is needed to register an ICO company in Singapore.
	Switzerland	The jurisdiction has developed a very liberal regulatory regime for this type of activity and has the largest ICO regulatory centre. A number of blockchain companies are currently developing the technology for initial token offerings. As well as in Spain, compliance with anti-money laundering and KYC regulations is required.
1	Illegal	The list of countries where digital currency and blockchain are prohibited includes Nigeria; Indonesia; Vietnam; Saudi Arabia; Bolivia; Pakistan; Qatar; Algeria; Afghanistan; Bangladesh; Macedonia; Vanuatu.

Source: compiled by the author on the TADVISER basis, 2022

Currently, the fintech market is considered the fastest growing segment of the Russian financial market as it is evidenced by EY's estimates of financial and technological services penetration (banking and non-banking sectors) to Russia [7].

China and India are the obvious leaders in the penetration of fintech. They are followed by Russia with a very solid 82% share in the top three. Russia and the EU are the biggest players in the top three with Europe having most financial service providers followed by the second and the third largest players in the world. It indicates a good environment for fintech in the country. The dynamics of fintech penetration to the world shows that almost all markets are growing rapidly. This growth is mainly due to pressure to launch online products and services in the context of COVID-19.

Compared to 2019, Russia reached 82% of fintech penetration in 2020 ranking third among the world's largest markets (China - 87%, India - 87%) (Figure 1).

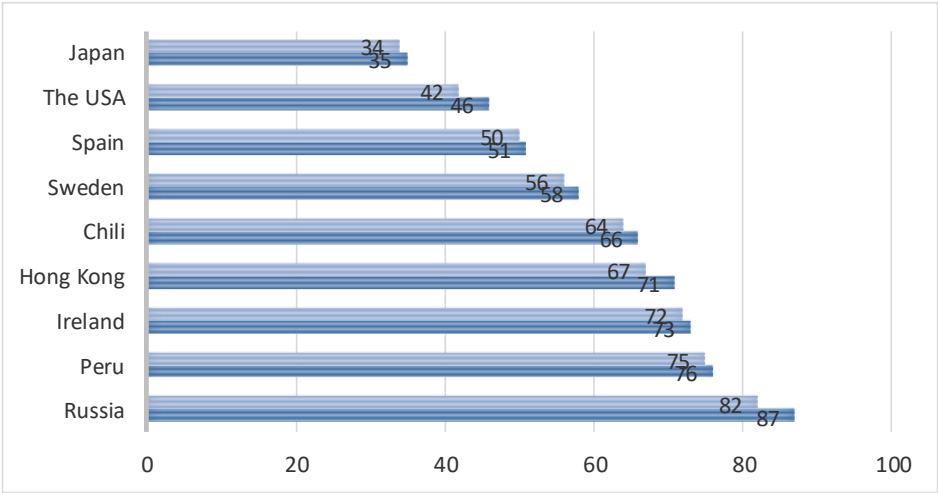


Fig. 1. The fintech penetration to 27 countries in the retrospect of 2020. Source: [Statista, 2020].

The penetration of fintech and blockchain is increasing in the three leading countries by 18 percentage points in China, 35 percentage points in the state of India and with the relative indicator by 39 percentage points in our country [8].

The blockchain technology has demonstrated its transactional potential by 2021 and the high-quality assets proliferation in digital form has become a key factor. The introduction of regulated asset networks accelerates the pace of innovation in digital assets, especially digital currency funds regulated or directly supported by central banks.

The current reaction against private and stable cryptocurrencies is growing in intensity as the public sector seeks to rethink itself accelerating experiments with digital money - currencies (Figure 2).

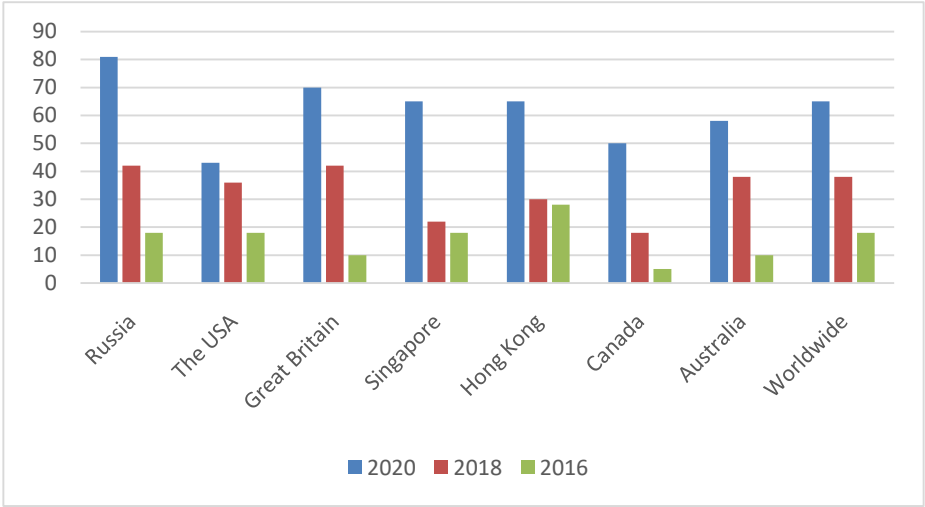


Fig. 2. The distribution of blockchain technologies dynamics from 2016 to 2020. Source: compiled by the author according to [10].

E-commerce has made online money transferso popular that many organizations and companies have stopped using cash at alllike the myth of a paper virus during the pandemic. Moreover, the number of transactions usually grows from year to year so the system should change [9].

However, financial and investment activity replacing credit decreased by 35% in 2020 due to a drop in the purchasingpower (Figure 3).

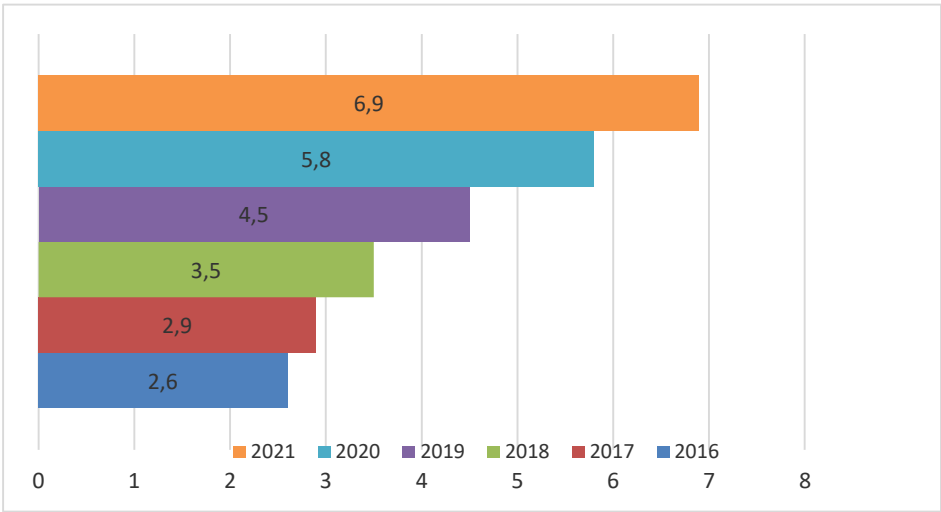


Fig. 3. The dynamics of global transactions (trillion dollars). Source: compiled by the author [10].

4 Conclusions

It should be noted that the fintech market in the digital age is difficult to assess objectively since not all information is available, the data is uncertain and surprisingly diverse. However, various sectors, especially payments and remittances, as well as corporate and

personal finance show significant growth of 20% per year. Sustainable growth policies in these sectors are currently being successfully implemented. Moreover, it should be noted that the growth rate of payment projects reached more than \$12 billion even in the difficult year of 2020.

Thus, the results of the analysis suggest that fintech and blockchain trends can be confirmed in a global rate (Table 2).

Table 2. Global Financial Technology and Blockchain Trends for 2022

Worldwide financial technologies and blockchain tendencies	Integration of banking services into non-banking applications. The importance of integrating financial products such as payments, credit and debit cards into non-banking applications is growing every year. Competition for purchase reaches new levels. For instance, it is possible to apply for a credit online without much effort now.
	Information is received in real time. Obviously, owners of the data have more power. Waiting long for an extract on the financial situation of the client organization from a banking authority is no longer sensible since the information about the client is already outdated. Therefore, it is extremely important now to develop analytical resources that can quickly analyse the necessary information.
	2020 was the year when countries announced the creation of their own digital currencies. It was accompanied by the introduction of cryptocurrencies and crypto services/solutions as a result.
	New aspects of insurance and lending. The traditional financial products will have to be left behind in the era of competition for customers. Insurance will also be included in the financing sector.
	Payments will be made without intermediaries. This mainly applies to online payments in e-commerce: the huge popularity of COVID19 shows the need for change in an environment where there is moving away from the method market goods and services are paid by.

Source: compiled by the author

The following disadvantages are highlighted among the characteristics of the fintech sector:

- Difficulties while funding accessing
- Long return on investment period
- Cybersecurity commitment
- Lack of experience in the sector
- Conservative nature of the market
- Reduced incomes of firms due to COVID-19
- Firms are not ready to implement fintech.

In conclusion, it should be noted that the fintech sector offers many advantages and preferences for business development even despite some problems. Money transfers, electronic banking, insurance activities and asset management are especially important areas for fintech. Artificial intelligence and big data will be in the increasing demand. These innovations will allow companies to reach a new level of efficiency, outperform competitors and increase profits. However, the fintech implementing should be thought over well. For example, some SME (small and medium-sized business) may not need fintech in terms of investment and payback.

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