Fintech innovations and transparency of finance: world practices and Ukrainian realities

MONOGRAPH

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INTRODUCTION

The field of digital finance is a financial platform where information and communication technologies and artificial intelligence make it easier to solve many problems. Thanks to artificial intelligence, financial and insurance companies, banks, and other financial market players reduce the influence of the human factor on decision-making, analyze large amounts of data faster and more thoroughly, reduce costs and automate the process of communicating with consumers.

Transparency of finances is currently a key factor in deterring and combating corruption the G-20 actively promotes greater transparency in budget processes, the conclusion of public contracts, public involvement in the budget process, the use of open data and joint coordination. The exponential growth of digital technologies opens significant potential for increasing the amount of open data, their quality and accessibility to create the right information environment and the necessary tools to fight corruption.

The relevance of the study is due to the spread of financial technology in all aspects of public, corporate and personal finance and the growing rate of their use due to the Covid-19 pandemic.

The rapid growth of the role of digital technologies in the financial sector and the emergence of innovative ways to implement them are the reasons for the increased attention of financial regulators to the development of new tools for faster, safer and more transparent payments. As a result of the digital transformation, economic activity is changing, the role of cash is declining, which stimulates the emergence of digital forms of money. Currently, the idea of issuing the digital currencies by central banks deserves the most attention and determines the relevance of this study, not only in the domestic space, but also around the world.

The monograph was prepared by a team of authors:

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1 DEVELOPMENT OF FINANCIAL TECHNOLOGIES AND THEIR IMPACT ON THE CURRENT STATE OF THE FINANCIAL SYSTEM

1.1 Theoretical aspects of the use of financial technologies in the financial system, their essence and classification

The development of technology has served as a driver of macroeconomic transformation. A key factor in the development of the financial system has been the introduction of new financial technologies that emerge as a result of conservative financial management in the use of digital technologies. In recent years, the financial technology industry is developing rapidly [135].

Fintech (financial technologies) is a line of business that uses new technologies and innovations in the financial services market.

Today, fintech is often considered as a unique segment of financial services and information technology, and there are several interpretations [135]:

– a new sector of the economy, consisting of young companies that provide improved products and services in the financial market;

– companies of the newest technologies which on the basis of own means develop mechanisms of introduction of innovative technologies in a traditional financial sector of economy;

– the use of software to meet the demand for financial market products.

It should be noted that the emergence of fintech was provoked by the global financial crisis of 2008 and caused by the transition of financial market participants to low-capital business models, modernized in accordance with modern market realities. Subsequently, the leveling of market conditions contributed to the emergence of innovative participants in the

financial services market, fintech companies. The current state of fintech is characterized by rapid digital transformations based on the spread of artificial intelligence, robotics and other innovative technologies.

Thus, we can say that fintech has evolved from the introduction of technology exclusively in traditional sectors of the economy in a unique segment of financial services and information technology that can meet the expectations of users. In turn, fintech service providers are professionally managed companies with a wide range of operational capabilities, a wide range of products and an international presence.

Fintech is changing the way the traditional financial market operates and is one of the fastest growing segments at the intersection of financial services and innovative technologies. In this segment, technology startups and new market participants apply innovative approaches to creating products and services, creating the preconditions for the effective development of fintech [131].

The development of financial technologies to a greater extent consists in the modernization of traditional financial services and products, which can be classified as follows:

– cash operations, clearing: P2P-payments; mobile wallet; cryptocurrency;

– loans, deposits and capital raising: consumer lending and business lending P2P; mobile banking; crowdfunding;

– capital management: robo-consulting; programs for financial planning, social trading, algorithmic exchange trading; money saving services.

The development of financial technologies has a significant positive impact on the financial market in various aspects, in particular [140]:

– increasing the competitiveness of financial companies, their products and services, which leads to empowerment of consumers, democratization of access to financial services,

especially in developing countries, and, as a consequence, stimulating further innovation.

– creation of new investment opportunities for existing financial companies. Banks and insurance companies are increasingly investing and buying out fintech companies as part of their (broader) investment portfolio.

– increasing the efficiency of financial services by upgrading the infrastructure.

– optimization of risk management.

– improvement of financial supervision.

Assessment of the impact of new technologies on the financial market has recently become particularly important 2 factors:

– the level of acceptance of basic technologies by society.

– the degree and prevalence of technological know-how among the general population.

Fintech today offers the following technological trends [127]:

– cloud technologies and big data. Cloud technologies provide access to data without installing special applications on the device, which allows banks to offer their products anywhere in the world, centralizing services online. Big data, in turn, provides customers with personalized targeted proposals based on the analysis of heterogeneous and rapidly changing digital information, the sources of which are the Internet, archives of corporate documents, readings of sensors, devices, etc.;

– API (Application Programming Interface - application programming interface), integrated into customer interaction systems. API - a set of definitions of routines, interaction protocols and tools for creating software provided by an application, service or operating system for use in external software products.

– social media and mobile communication with the help of special applications. The integration of the banking business with social networks allows to obtain information about

customer preferences in order to use it in offering new financial products, establishing a relationship of trust with each bank's customer, accelerating the introduction of blockchain technologies in customer relations. Examples of successful implementation of such relations in retail are Amazon, in banking - Deutsche Bank.

The development of financial technologies in the financial sector, especially noticeable over the past five years, has been caused by the following circumstances [84, 56]:

– loss of customer confidence in the traditional banking sector during the global financial crisis of 2008 and tightening of regulation. Trust is an absolutely necessary category for the successful functioning of the financial system, and its loss has accelerated the process of development of financial technologies, which is inevitable in any case. Against this background, there is a demand for services provided by startups, as well as for the optimization of services caused by the decline in their profitability due to stricter regulation;

– raising the level of expectations regarding the provided services, including financial ones. The consumer is becoming more and more focused on constant updating and acceleration of processes, greater availability of technology and greater convenience of services in the conditions of obsolescence and limitations of traditional financial services both in form and in essence. The development of information processing technologies has determined the development of such fintech segments as P2P lending, online scoring, algorithmic trading, blockchain, etc;

– the spread of mobile Internet, which leads to the fact that the emphasis of the strategy of attracting customers of the bank shifts from opening another branch to the creation of Internet services and support for the mobile version of the site;

– desire for innovation, increased requirements for ease of use of services, quality and speed of information;

– legislation for which consumer rights should be a priority, and their protection should not hinder the introduction of innovation and adapt the rules to the requirements of the financial sector;

– success of technology companies in other sectors of the economy (retail, entertainment, etc.). The emergence of successful companies that have significantly changed their markets and offered more competitive goods and services has aroused the interest of entrepreneurs, including in the financial sector.

In general, in the financial sector there are various forms of cooperation between classic financial companies and fintech. If some time ago fintech was considered as a potential threat, now the conditions of cooperation and mutual benefit are being discussed.

Fintech companies can support the banking sector by providing specific services and solutions as risk analysis services. Fintech perfectly complements traditional banking, helping, for example, to use available data more wisely and to offer data analysis services, as data is more valuable today than gold and oil [61].

New technologies are changing the way fintech banking and financial services are used. Unlike previous historical episodes of increased competition in the banking market, alternative destinations are now developing too fast.

The banking industry has existed for centuries. And during this time, she was repeatedly predicted the inevitable end. For example, in the middle of the XX century. in the United States in the 1970s, the threat to traditional banking came from alternative lending institutions, mutual funds offered alternatives to deposits, and in the early 2000s, banks faced competition from large commercial and industrial companies that began to obtain banking licenses and offer services. addition to its core business.

But what is happening now is different from the periods of intensification of competition in previous years in scale, speed and global nature. The scale of innovation is unprecedented, it is being implemented with incredible speed and easily spread around the world, ignoring boundaries. This changes not only the models of banking business, but also the principles of financial services.

The impact of technology on financial services is a test not only of the existing business model, but also of the traditional scheme of financial regulation. Regulators need to balance many forces to ensure financial stability, a competitive and efficient environment, and proper data processing. For example, it is not yet clear how financially stable financial stability is. The services traditionally combined by one bank, inherent in the current technological breakthrough, may lead to the formation of a new type of risk. For example, some activities do not fall within the perimeter of prudential regulation and supervision. In addition, financial projects that use wholesale financing may be liquidity vulnerable.

It is also unclear how artificial intelligence and algorithmic financial services based on new types of data will behave during the crisis. At the same time, growing dependence on digital processes and systems increases operational and cyber risks. They are now perceived and regulated as specific, but the digitization of financial services makes them systemic, which may necessitate a revision of the regulatory approach.

Fintech is a complex system that brings together the new technology and financial services sectors, startups, and related infrastructure. The financial services sector is increasingly using new technologies and tools to perform its functions and implement fundamentally new solutions that interest consumers. Today, new financial technologies are penetrating the manufacturing sector, including retail, affecting the segment of lending, accounting services, insurance, asset management,

investing, mass real estate valuation, tax administration and more. The impact of fintech on financial, banking or insurance activities and the impact of fintech on their products and services gives impetus to the further development of the financial market. To compete with fintech projects, companies must either rebuild quickly or benefit from each other's cooperation, as they have accumulated vast experience in dealing with customers and created functional opportunities for the development of the financial sector over the years.

1.2 Advantages and disadvantages of financial technologies for the financial system

Not so long ago, fintech was perceived exclusively as an internal development and process of financial companies, so consumers of financial services did not have direct access to it. But today without fintech it is impossible to imagine money transfers, crediting, payment of utility bills, etc. Today's consumers of financial services need easy online access to financial services, fast lending and free payments - all the innovations that have helped to promote fintech, according to a report by Deloitte at the World Economic Forum.

Even though today fintech does not have a dominant position in the financial world, some companies have achieved significant success in this area, which has allowed fintech to become an important link in the process of providing financial services.

Fintech has had a significant impact on insurance and investment. For example, in the United States, car insurance based on "telematics" is quite common, when the cost of insurance depends on driving time, on the principle - you pay when you use, which is tracked using data collected through a smartphone or "black box" installed in the car. Fintech has a number of obvious advantages over traditional financial

services, which can be considered opportunities for its rapid development [124, 43, 60]:

Speed and convenience.

Fintech services are provided on the Internet, so consumers can use the services without leaving home.

A wide range of services.

Due to the lack of borders on the Internet, consumers have more options to choose from.

Favorable conditions for services.

Fintech companies do not invest in physical infrastructure, so they attract consumers with more favorable conditions for providing their services in contrast to traditional financial companies.

More personalized products.

Thanks to technological development, fintech companies collect and store more information about customers to provide consumers with more personalized products or services.

Fintech also has some disadvantages that can be potential risks for its misfire [124, 43, 60]:

Fuzzy regulation.

Fintech companies are new to the financial industry and use business models that are not like traditional financial companies. This leads to more complex legal regulation, which may limit or level the rights of consumers and their protection.

Spontaneous decisions.

Consumers of online services generally do not have enough information about the terms of service, so they may make ineffective decisions.

Technological risks.

Fintech companies receive a lot of private information about consumers online, which can lead to misuse of personal data or cybercrime.

"Not for everyone"

Although financial services are becoming simpler and more accessible thanks to fintech, a significant proportion of the population will not be able to use electronic devices for online transactions for various reasons.

Over time, an increasing proportion of the population will be annoyed by visiting the physical branches of banking or any other non-banking financial companies for financial transactions. Traditional financial companies with physical branches, such as banks, will find it more difficult to rely solely on servicing current accounts, deposits and loans as their main sources of income. Fintech is changing the entire sector of financial and banking services in particular: changing the methods, time and place of financial services and products, creating new conditions for the interaction of banks and fintech companies with their customers.

The future of the financial sector, including banking, depends on the analysis of consumer information and available digital technologies for the provision of services, which already make it easier for consumers to control their finances. Fintech companies show a broader view of the banking business, offering both banking and non-banking services, and speed and convenience, variety of choices, more personalized products and more favorable service conditions only improve their financial market position relative to traditional financial companies. In general, the development of fintech leads to a large number of business models that can cause problems for both market participants and supervisors and regulators, designed to ensure the right balance between financial stability and consumer protection, leaving room for innovation. Therefore, the elimination of fintech risks will help strengthen the position of the new financial industry.

1.3 Current state and trends in the development of financial technologies in the financial system of Ukraine

Ukrainian business has long since moved into the digital space. The business has realized that it is not only convenient and fast, but also safe. And tokenization confirms this. Card data has been replaced by tokens, which allow online merchants to increase the security of online transactions and improve consumer preferences. The use of different devices for calculations is therefore a strong confirmation. Now you can pay with a watch, glasses, and other products [50].

Fintech is a promising market for profitable investments and a free niche for startups that want to radically change our usual financial, in particular banking. Of course, Ukraine is not so widely represented on the international market now, but Ukrainians have something to be proud of on the domestic market.

Thanks to strong IT specialists, Ukraine will soon be able to become a reliable foundation for the growth of fintech startups. In addition, Ukrainians have all the prerequisites for this: a strong IT team, which by the way is highly valued in the European market, a high level of Internet coverage, as well as a huge desire of individuals and companies to remotely manage their finances [76].

Today in Ukraine the most popular destinations are mobile payments and mobile wallets. More than 100 companies offer their services not only in the domestic market, but also internationally. If you look at the fintech of Ukraine in numbers, namely the indicators demonstrated by Klynveld Peat Marwick Goerdeler in the study of the fintech market in 2019, you can immediately understand in which direction the country is moving [128]:

– 4th place in the number of contactless payments in the world;

– 79.5% of payment terminals that support contactless payment;
– 59.4 million payment cards, 62% of which are used regularly;
– 63% of the population constantly use the Internet;
– 45% of the population uses smartphones.

Given that European and international banks are constantly innovating and attracting startups to solve their problems through their own acceleration programs, Ukrainian fintech can express itself [59].

Ukraine is not yet represented in the global financial services market, but the domestic market has long been undermined by a team known today as the fintech band, and their product - monobank is growing at a staggering pace. Despite the transfer of fintech band co-founder Dmytro Dubilet to the Cabinet of Ministers in the civil service, the project has maintained its growth rate and continues to delight with new services. The same team launched the koto project on the UK market, which resembles a monobank, but is completely different.

According to the report on fintech companies submitted to UNIT.city in 2019, the largest segment of fintech in Ukraine is the segment of electronic payments and money transfers, in second place - technology and infrastructure, in third place - online lending, then online insurance, non-banking, etc. [25]. Consider the market of payment cards in Ukraine, namely the volume of payment cards, the data on which are given in Table 1.1 [115, 116, 117, 118, 136].

Table 1.1. Volumes of payment cards in Ukraine in 2016-2020

Article	Years				
	2016	2017	2018	2019	2020
Issued payment cards, million pcs.	57,63	59,87	59,4	68,9	73,4
Active payment cards, million pcs.	32,39	34,86	37	42,2	40,4
Contactless payment cards, million pcs.	1,99	2,7	4	8,6	13,2
Tokenized payment cards, million pcs.	0,054		1,1	2,5	3,9

According to Table 1.1, the number of issued payment cards during 2016-2020 increased from 57.63 to 73.4 million units, ie by 15.77 million units. or by 27.36%, having experienced the largest growth in 2019 by 9.5 million units. or 15.99%, the number of active payment cards during 2016-2020 increased from 32.39 to 40.4 million units, ie by 8.01 million units. or by 24.73%, having experienced the largest growth in 2019 by 5.2 million units. or 14.05%, but having decreased in 2020 to 40.4 million units, ie by 1.8 million units. or 4.27%, the number of contactless payment cards during 2016-2020 increased from 1.99 to 13.2 million units, ie by 11.21 million units. or more than 5.6 times, having experienced the largest growth in 2019 by 4.6 million units. or 115%, and the number of tokenized payment cards during 2016-2020 increased from 0.054 to 3.9 million units, ie by 3.846 million units. or more than 71 times.

Let's analyze the volume of transactions performed using payment cards, presented in Table 1.2 [115, 116, 117, 118, 136].

Table 1.2. Total volumes of transactions made using payment cards in 2016-2020

Article	Years				
	2016	2017	2018	2019	2020
Number of operations, million units	2513	3135	3900	5057,3	5997,1
Amount of transactions, UAH billion	1610,3	2125	2877	3576,7	3957,3

According to Table 2, the number of transactions made using payment cards during 2016-2020 increased from 2513 to 5997.1 million units, ie by 3434.1 million units. or 138.64%, having experienced the largest growth in 2019 by 1157.3 million units. or 29.67%, and the amount of transactions made using payment cards during 2016-2020 increased from 1610.3 to 3957.3 billion UAH, ie by 2347 billion UAH or 145.75%, having experienced the largest growth in 2018 by UAH 752 billion or 35.39%.

Consider the volume of transactions for cash withdrawals and non-cash payments, presented in table 1.3 [115, 116, 117, 118, 136].

Table 1.3. Volumes of transactions using payment cards in 2016-2020

Article		Years				
		2016	2017	2018	2019	2020
Cash withdrawal	quantity, million pieces	738	750	800	890,2	786
	amount, billion UAH	1038,9	1290	1580	1778,4	1748,6
Cashless payments	quantity, million pieces	1775	2300	3100	4167,1	5211,2
	amount, billion UAH	571,3	835	1297	1798,3	2208,7

According to Table 1.3, the number of cash withdrawals carried out using payment cards during 2016-2019 increased from 738 to 890.2 million units, by 152.2 million units. or by 20.62%, but in 2020 decreased to 786 million units, by 104.2 million units. or 11.71%, and the amount of cash withdrawals carried out using payment cards during 2016-2019 increased from 1038.9 to 1778.4 billion UAH, by 739.5 billion UAH or 71.18%, however, already in 2020 it decreased to UAH 1,748.6 billion, by UAH 29.8 billion or 1.68%, the number of non-cash payments made using payment cards during 2016-2020 increased from 1,775 to 5,211.2 million pcs., ie 3436.2 million pcs. or by 193.59%, and the amount of non-cash payments made using payment cards during 2016-2020 increased from 571.3 to 2208.7 billion UAH, by 1637.4 billion UAH or 286.61%.

Next, consider the structure of transactions in terms of cash withdrawals and non-cash payments made using payment cards during 2016-2020, presented in table 1.4 [136, 115, 116, 117, 118].

Table 1.4. Structure of volumes of transactions using payment cards in 2016-2020

Articles		Years				
		2016	2017	2018	2019	2020
Cash withdrawal	quantity, million pieces	29,37	24,59	20,51	17,60	13,11
	amount, billion UAH	64,52	60,71	54,92	49,72	44,19
Cashless payments	quantity, million pieces	70,63	75,41	79,49	82,40	86,89
	amount, billion UAH	35,48	39,29	45,08	50,28	55,81

According to Table 1.4, the share of the number of cash withdrawals carried out using payment cards during 2016-2019 decreased from 29.37% to 13.11%, the share of the amount of

cash withdrawals carried out using payment cards during 2016 - 2019, decreased from 64.52% to 44.19%, while the share of the number of non-cash payments made using payment cards during 2016-2019 increased from 70.63% to 86.89%, and the share of non-cash payments, made using payment cards during 2016-2019, increased from 35.48% to 55.81%.

Let's plot and compare the amounts of cash withdrawals and non-cash payments in 2016-2020, as shown in Figure 1.1 [136, 115, 116, 117, 118].

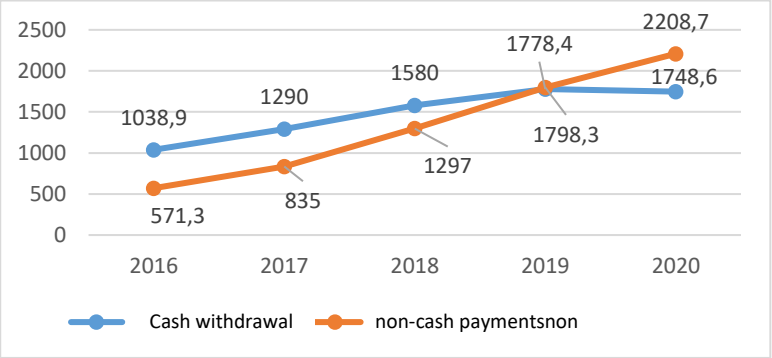


Figure 1.1 - Comparative characteristics of transactions made using payment cards in 2016-2020

According to the data in Figure 1.1, during 2016-2018, the amount of cash withdrawals from payment cards exceeded the amount of non-cash payments, and in 2019-2020 the amount of non-cash payments was higher than the amount of cash withdrawn. As for the payment infrastructure, it is represented by several "monsters" – it's Privat 24, which belongs to Privatbank (and from which came the "fintech gang"), Wayforpay and Portmone. Until Paypal or Stripe enters the Ukrainian market, these companies will feel very well [140].

Another segment that is actively developing is "cloud cash registers" and systems for POS terminals. Mention should be

made of Poster POS, POSJam and SkyservicePOS, which help businesses serve customers.

If we talk about the development of cryptocurrency in Ukraine, the only exchange is Kuna, which is a "bridge" between cryptocurrency and hryvnia, which allows both to buy cryptocurrency for the national currency and receive the hryvnia for the sale of cryptocurrency. At the same time, the news repeatedly mentioned the creation or testing of electronic UAH both under the auspices of the National Bank and with the participation of other drivers of the process. At the same time, basic technology (blockchain / DLT) remains a hot topic for Ukrainian fintech startups. Although the hype around this term is no longer what it was a couple of years ago, so no one seriously plans to create an "alternative bitcoin". It should be noted that the assessment of the importance of the blockchain by banks and fintech companies is very different (banks consider the introduction of technology much more critical than fintech companies would like).

According to global experts, the implementation of DLT infrastructure by financial service providers can reduce 30-70% of their costs in areas such as financial reporting, compliance, and business operations. DLT solutions provide the ability to increase transparency, data validation, internal control, reduce the need for data reconciliation, and open unlimited opportunities for data exchange.

In general, fintech is clearly a "hot" topic for the Ukrainian market, but views on the priorities and development of this market and its various participants differ (from minor changes to radically opposite views, for example, the system of remote customer identification is the number one priority for fintech companies, but not even included in the top 10 priorities for banks). At the same time, public authorities have their own interests, which are often manifested in the desire to collect as many taxes as possible.

1.4 Foreign experience in the use of financial technologies

Consumer behavior has changed, and many existing financial companies in some markets simply do not keep pace with societal change, allowing new players to enter the market [57].

Technological advances are changing our daily lives. Innovations such as IoT (Internet of Things), AI (artificial intelligence), blockchain and cloud storage are the main drivers of fintech companies [46].

Greater access to information through analytics, artificial intelligence and cloud computing allows companies to more quickly see trends and adapt to them [54].

Investment in this sector is huge and continues to grow rapidly, ensuring that we will see much more success soon.

Fintech has changed the way people think about exchanging money and value in real time. Cashless businesses are appearing everywhere, forcing reluctant consumers to get used to digital transactions, and governments to discuss whether it is discriminatory or just progress. Requiring consumers to pay for goods and services electronically instead of using cash is only the first step.

Fintech equips the banking sector with tools that make it more efficient than ever. Banks use tools such as chatbots to improve customer interaction, mobile apps to help customers view their bank accounts in real time, and machine learning to protect against fraud.

Mobile banking is flexible, simple and saves time. Some banks go beyond offering virtual assistants to make the mobile experience even easier. From text and voice payments to fraudulent warnings and credit score notifications, virtual assistants are already perfecting the relatively new world of mobile banking. Consider some of the world's most famous fintech startups, which have achieved significant success in their segments [52, 58].

Revolut is an English financial technology company that offers accounts with debit and virtual cards, Apple Pay, interest "repositories", currency exchange, commission-free stock trading, cryptocurrency, goods, and other services.

Ally Assist is a virtual assistant in the Ally Bank mobile banking program. Ally Assist supports both text and voice, meaning users can simply speak or write to an assistant to take care of their banking needs. Some of the tasks that Ally Assist performs include payments, deposits, transfers, and requests for detailed information. The assistant learns from users, anticipating needs and recommending the best solutions.

Google Pay and Apple Pay are digital wallet and online payment systems designed to make contactless purchases in apps, online, and in person on mobile devices, allowing users to make payments using smartphones, tablets, or watches.

PayPal, an American company that operates an online payment system in most countries that support online money transfers, is an electronic alternative to traditional paper methods such as money transfers and checks. The company works as a payment processor for online sellers, auction sites and many other commercial companies. PayPal charges in exchange for benefits such as one-click transactions and authorization data storage.

Technology giant Amazon is leading the way in combining an online account with the traditional experience of retail in stores without checkouts to test the new concept. Customers simply take the goods they need, and when you leave the store, their account is automatically charged for them. This concept is likely to shape the future of shopping.

Insurify is an online company that has a software platform that specializes in car insurance. Its software platform uses artificial intelligence, speech processing and chatbots, and it provides personalized guidance to help users make car insurance decisions.

Cosmose is the developer of a data analysis platform for predicting consumer behavior when shopping offline. The platform helps retailers sell most of their products by combining offline stores with online advertising to predict where, when and who will go shopping, allowing retailers to track and target their offline audience through online advertising and measure the impact of their online marketing campaign.

Today, there are thousands of fintech companies in the world, working in various industries. Their activities by species in relative terms are shown in Figure 1.2. According to Figure 1.2, the least popular areas of fintech are neobanks, ancillary service startups and remittances with shares of 0.4%, 1.9% and 2.3% respectively, and the most popular are lending, investment platforms and payments of 10,7%, 11.2% and 19.1%, respectively [60].

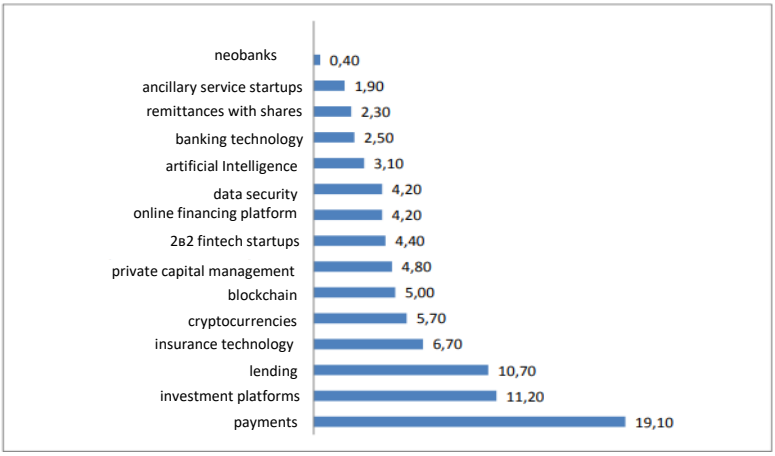


Figure 1.2 - Activities of fintech companies by areas, %

In recent years, investment in fintech has been growing at an incredible rate, which is not surprising. And the share of investments by type in relative terms is presented in Figure 1.3. According to Figure 1.3, today the least attractive for investment

fintech areas are crowdfunding and consulting with shares of 1% and 2%, respectively, and the most attractive - banking technology, payments and lending with shares of 10%, 17% and 31%, respectively [60].

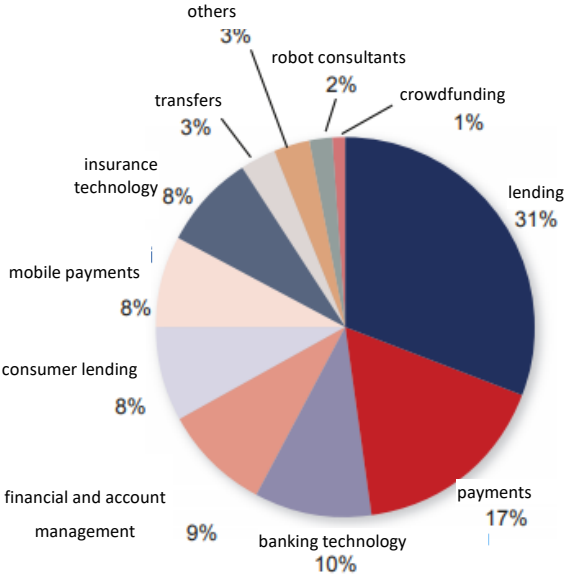


Figure 1.3 - Global investment in fintech companies by areas, %

Despite the fact that the fintech market has received significant investment in recent years, and a sufficient share of fintech startups are developed, launched and operate at their own expense, a significant share of fintech startups (49%) seek funding from external investors, as shown in Figure 1.4.

Consider the division of the fintech market into segments, information on which is shown in Figure 1.5. According to Figure 1.5, 56% of fintech providers provide services in the B2B segment (of which 62.5% are corporate clients, and 37.5% - small and medium-sized businesses), 22.5% - in the B2C segment (with

which 100% - mass segment), and 21.5% - simultaneously in both segments (of which 92% - mass segment) [60].

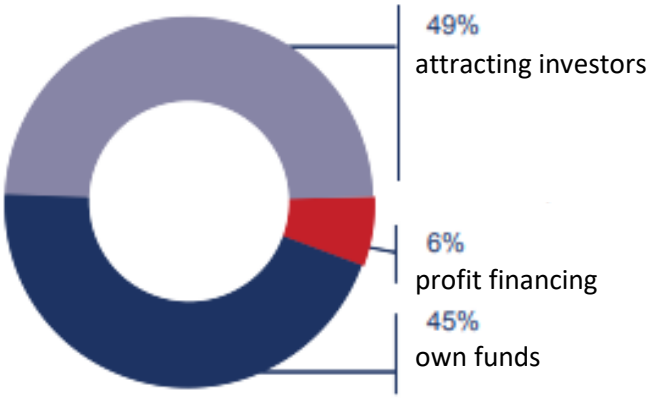


Figure 1.4 - Sources of funding for fintech startups,%

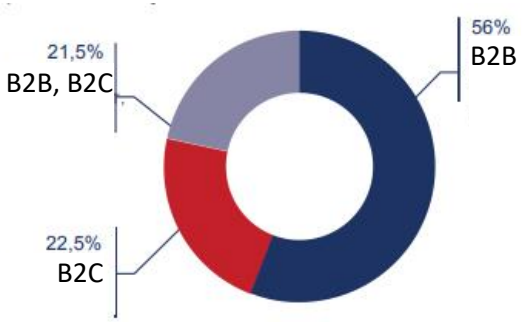


Figure 1.5 - Distribution of fintech companies by segments,%

According to a survey conducted by Ernst & Young, which was attended by more than 22,000 consumers who actively use digital services, the average penetration rate of fintech services

is 33%. Figure 1.6 shows the share of fintech users in the total population that actively uses digital technologies.

According to Figure 1.6, the largest share of fintech users in the world in the total population that actively uses digital technologies, in the UK, India and China, namely 42%, 52% and 69% respectively [60].

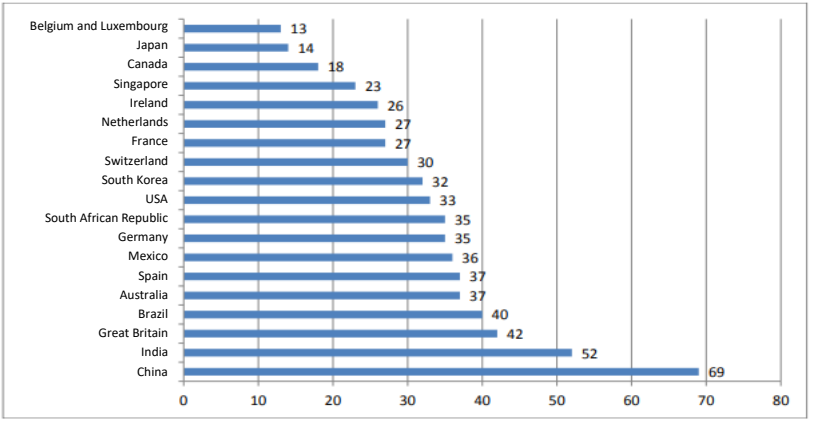


Figure 1.6 - The share of users of fintech services in the total population that actively uses digital technologies, %

As a result, here are some fintech statistics for recent years:

– as of February 2021, there were 10,605 fintech startups in America, 9,311 such startups in the EMEA region (Europe, the Middle East and Africa) and 6,129 in the Asia-Pacific region;

– according to the Global Fintech Acceptance Index 2019, 96% of consumers worldwide know about at least one fintech service, and 64% of consumers have used at least one or more fintech platforms;

The most common reasons for using fintech, according to respondents, are:

– functionality and functions (66% of respondents), availability of services 24 hours a day, 7 days a week (55%), ease of setting up and using services (53%);

– in 2018, about 61% of Americans used digital banking, which by 2022, according to Statista.com, should grow to 65.3%;

– one of the largest segments of fintech is digital payments, which occupy 25% of the fintech market.

According to Business of Apps, last year (2020) 1.3 billion users made at least one online payment using a mobile device, and the most popular mobile application for online payments was Aliapp (China).

These statistics show that the number of people who manage their finances on the Internet is already huge, and is projected to grow steadily in the coming years.

Fintech enables financial service providers to explore new markets and allows consumers in regions where there have been few opportunities to access services that were previously unavailable via mobile devices. Fintech companies are able to cover and reap the benefits of markets that are currently underfunded, especially in Asia and the Southern Hemisphere.

Due to the reluctance of some traditional financial service providers to change, Western markets are slower to use new technologies than other parts of the world. China, India and some other Asian countries may be ahead of their Western competitors. Banks and businesses in these markets began building infrastructure in the late 1990s and 2000s, and now they are reaping the benefits. For example, China's mobile payments already exceed cash payments.

Economies in the southern hemisphere, such as the Philippines, Indonesia, parts of Latin America, and sub-Saharan Africa, have been largely non-banking for decades, but this is changing as innovation in mobile payments and e-wallets grows. Thanks to telecommunications networks, most consumers in

these markets now have easy access to smartphones, which allows them to make digital transactions. Mobile phone sales in these regions are expected to grow significantly soon.

Although advances in fintech have been happening at lightning speed, we are only now beginning to scratch the surface of what is possible and what may happen in the next few years. It is no exaggeration to say that fintech is literally changing our lives and habits by simplifying trade, banking, and exchanging money without the need for physical interaction. However, the financial sector faces several challenges that need to be addressed, especially in data regulation and protection, in order to gain consumer confidence and to make fintech truly ahead of the traditional financial services market.

With large amounts of data, artificial intelligence, blockchain, and many other technological advances already in use or on the horizon, business leaders are encouraged to look for opportunities and use fintech applications in their own business models to win over tomorrow's consumers.

2 DIGITAL CURRENCIES: POSSIBILITIES AND RISKS OF APPLICATION

2.1 Theoretical bases of functioning of digital currency of the central bank

Over the centuries, payment technologies have adapted to societal requirements. Coins, banknotes, checks, and credit cards were innovations of their time. Currently, a new payment technology is being increasingly discussed: central bank digital currencies (CBDC) [15, 39].

Although the concept of retail CBDC was proposed decades ago by Nobel Laureate James Tobin in 1987, the idea was that central banks should create a public payment instrument "with the convenience of deposits and currency security." However, the perception of whether central banks should issue them has changed significantly in recent years.

In particular, an important point in the development of central currency projects of central banks was the presentation by Facebook of the cryptocurrency "Libra" and the corresponding reaction of the public sector. At the end of 2019, central banks, representing one-fifth of the world's population, announced that they would most likely release the Central Securities Depository soon. Thus, in 2019, the share of central banks that can issue retail CECs in the medium term, namely from one to six years, has doubled to 20%. Meanwhile, as many as 80% of surveyed central banks participate in research, experiments or developments of the Central Securities Depository [154, 138].

During the Covid-19 pandemic, social distancing measures, public concern that cash could carry the virus, and new intergovernmental payment schemes further accelerated the transition to digital payments and could give another impetus to the CEC.

The Bank for International Settlements treats the Central Securities Depository as a liability of the central bank, expressed in available units of value and acts as a means of circulation and a means of preserving value [36].

According to the definition of the International Monetary Fund, the Central Securities Depository is a form of existing fiat money that is issued by the central bank and can act as a legal tender [27].

In turn, the European Central Bank also considers this phenomenon as a kind of publicly available form of fiat money issued by the state and has the status of legal tender [41].

As we can see, the CEC is not a clearly defined term. However, the vast majority of experts suggest that this is a new form of central bank money. Thus, the digital currencies of the central bank are a liability of the central bank denominated in the national currency, which has a digital expression and is able to act as a means of payment, measure and preservation of value [48]. To better understand the mechanism of using the digital currency of the central bank, we propose to consider the existing structure of the payment system.

As you know, the traditional payment system is a public-private partnership that operates on two levels. The balance sheet of the state central bank includes cash and deposits of commercial banks. The private sector provides commercial banks with money that users can access through bank transfers, checks, credit or debit cards, and ATMs. More details are shown in Figure 1.1.

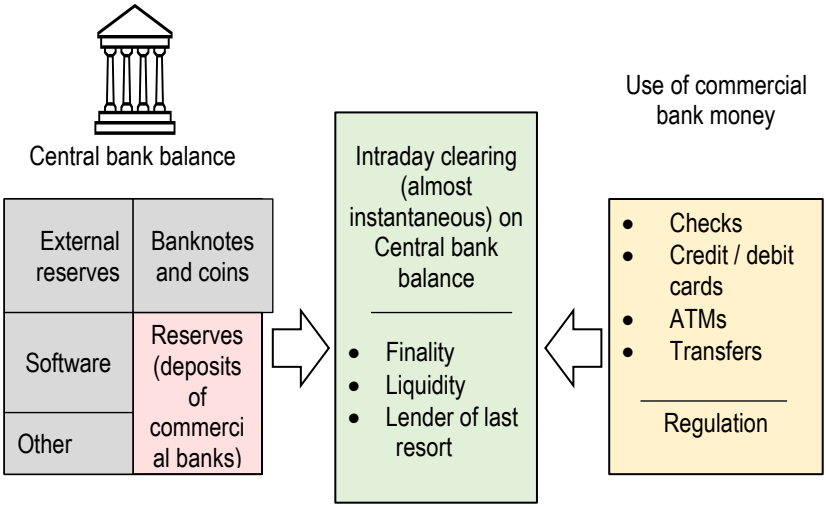


Figure 2.1 - The structure of the traditional payment system

There are constant settlements on the balance sheet of the central bank between the public and private sectors. Thus, central bank money has several characteristics.

First, the central bank provides the final settlement, thus eliminating the residual risk associated with making payments.

Second, the creation of this means of settlement on demand (ie, forming the liquidity of intraday settlements, usually secured), the central bank manages the payment system.

Third, he can act as a lender of last resort in the event of an emergency. These features - finality, intraday liquidity, and lender of last resort - are key contributions of central banks to the payment system. They ensure its safety, reliability, and operational efficiency. Another important feature of central bank money is neutrality. As a non-profit institution, it plays a trusted role in the basis of the payment system [139].

A review of the literature shows that there is no single specification of the CBDC, and its main characteristics are: conditions of access (for the general public or only for financial institutions), the order of issue (on a balance sheet or as a token), the degree of anonymity and interest income.

Based on the scope of use of the CBDC distinguish the following options for their implementation [31]:

– retail / general CBDC is digital currency available for general use, including legal entities and individuals; complements and (or) replaces cash, acts as an alternative to traditional bank deposits; interest income, as a rule, is not provided;

– wholesale CBDC is a digital currency available to a limited number of users, such as financial institutions that hold money in central bank accounts, or professional financial market participants; the scope of distribution is usually limited to interbank settlements.

Comparing the Central Securities Depository with the existing components of the payment system, bank reserves can be considered as the Central Securities Depository for exclusive use by commercial banks. Financial institutions maintain reserves with the central bank and use them for interbank settlements in the payment system. Figure 2.2 shows the green color as they exist today.

However, central banks are also currently studying wholesale token based CBDC as a new way for financial institutions to directly access and pay central bank money.

Instead, retail CBDC are attracting more attention. This would give the public digital means of accessing central bank money. They can be a new form of “digital cash” in addition to physical cash.

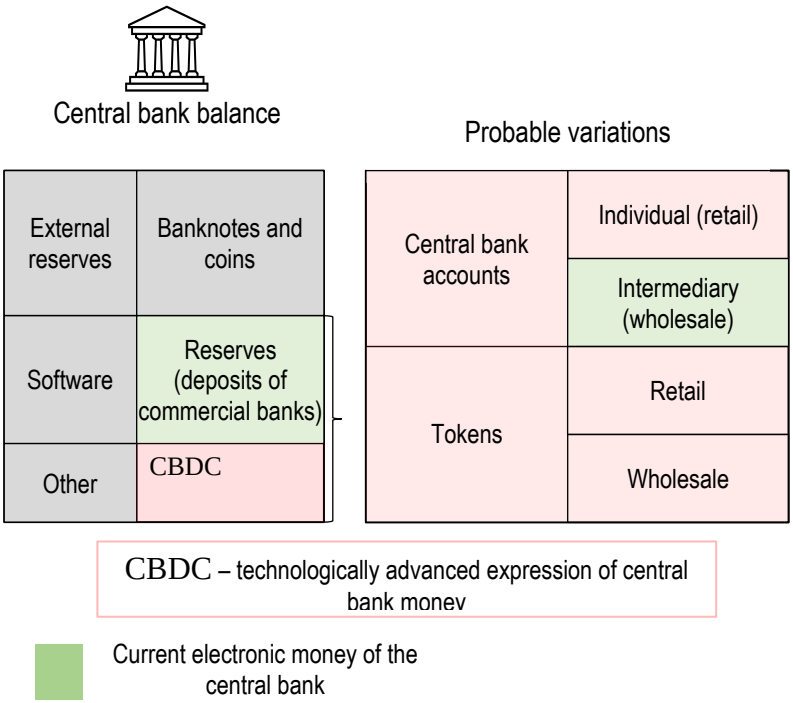


Figure 2.2 - CBDC as a new type of central bank liabilities

From the point of view of issue, there are two basic concepts of digital currencies of central banks, which differ in the process of payment verification:

1. Account-based (balanced): the creation of the CBDC is through the opening of personal accounts in the central bank to all economic agents. In this case, the transaction will be similar to the transaction between bank customers, except that the accounts will be opened with the central bank. Access to the account is provided through a web page or application on a portable device. Features of this concept are the high cost of maintaining accounts and the risks of disintermediation (reduction of the role) of traditional financial intermediaries.

2. The concept of value / tokenbased provides for the issuance of cash in digital form (token), which can partially or completely replace cash, more in line with the traditional architecture of the banking system.

Based on the above architecture, CBDC may differ in their operating configuration and how the private and public sectors work together to support the payment system [7].

The combination of emission methods and implementation options allows to form a set of non-mutually exclusive CBDC sub models. Most the world's central banks are building their own CBDC architecture, based on the scheme proposed by the Bank for International Settlements called "Money flower", which is presented in Figure 2.3.

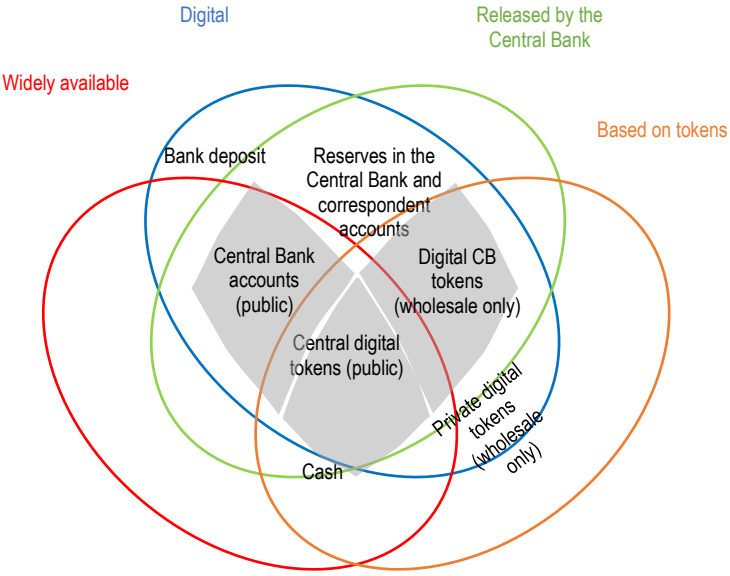


Figure 2.3 - "Money flower": taxonomy of money

This approach is based on a combination of four key properties of electronic money: the issuer (central bank or other); form (digital or physical); availability (wide or limited); and technologies (based on tokens or accounts) [52]. CBDC are at the center of the scheme. Taxonomy distinguishes three forms of CBDC (shaded area). Two forms are based on tokens, and the other - based on accounts in the Central Bank. The two token-based versions differ primarily for those who have access, which in turn depends on the potential use of the CBDC. One of them is a widely available payment instrument, focused mainly on retail transactions, but also available for wholesale transactions. Another is a digital payment token with limited access for wholesale payments and settlement operations [15].

According to the above taxonomy of money, we can conclude that from a functional point of view, the Central Securities Depository can act as an interbank settlement unit, a monetary surrogate, a monetary policy instrument or an analogue of deposits in the central bank [5].

Thus, the digital currency of the central bank is no longer something ephemeral for world finance and for Ukraine in particular, but rather the reality of today and the consequence of digital progress and technological development. The Central Securities Depository is an opportunity for central banks to offer a technologically advanced representation of central bank money for the digital economy. A crucial innovation is that the CBDC offers unique characteristics of central bank money such as security, neutrality, and finality. Central banks around the world will act in accordance with their own powers, reflecting the unique circumstances and goals of their society, creating their own view of the CBDC.

Although CBDC can increase efficiency and stimulate innovative competition in payments, they should not disrupt the current two-tier financial system. Currently, the introduction of the CBDC has a lot of unresolved issues, but the presence of attempts already indicates the possible introduction of this technology in the coming years.

2.2 Architecture of construction of digital currency of the central bank

The question of whether central banks should issue digital currency to the general public is attracting increasing attention. This special feature outlines some key considerations for the technological design of Digital currency of the central bank.

One of the ways to classify approaches to design is the "pyramid of the CBDC" [148]. This approach begins with the needs of consumers that the retail CBDC could meet, identifies related trade-offs with technical design, and then displays design choices. The design selection scheme forms a hierarchy in which the lower, initial layers represent the design solutions that are included in the subsequent higher-level solutions. To display this hierarchy, the selection is displayed as a pyramid, Figure 2.4.

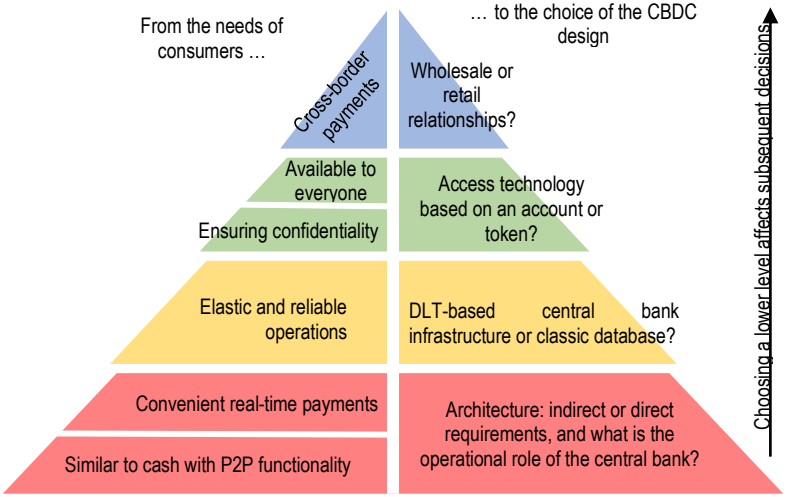


Figure 2.4 - Pyramid of the CBDC

The lower level of the CBDC pyramid is the legal structure of claims and the corresponding operational roles of the central bank and private institutions in payments. Our analysis begins with a review of the possible technical architectures for the CBDC, shown in Figure 2.5, the central bank, by definition, is the only party that issues and repurchases the CBDC. We note that all three architectures can be based on both an account and tokens and can run on different infrastructures.

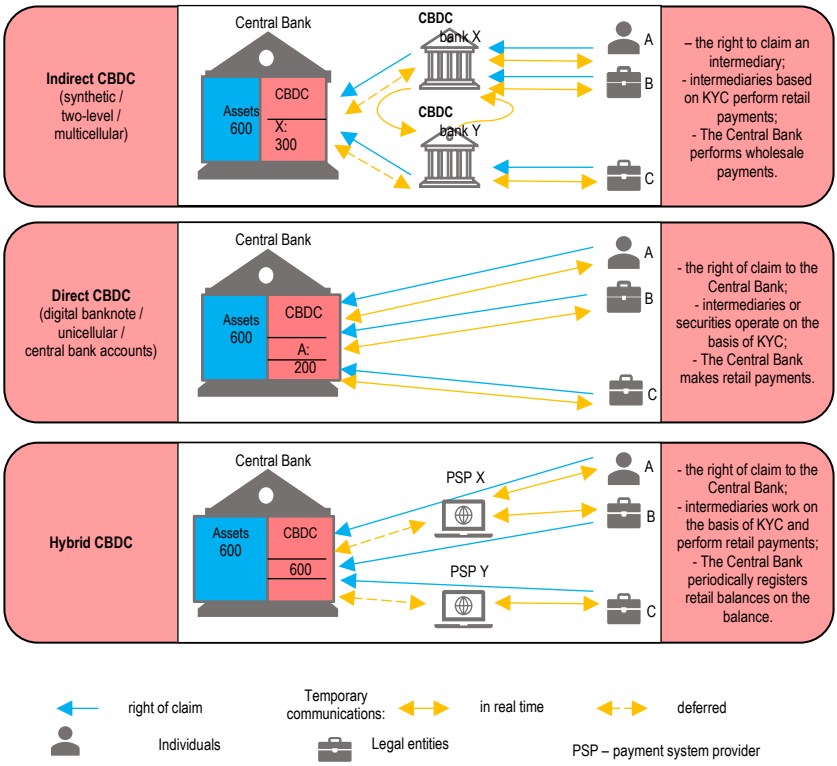


Figure 2.5 - Overview of potential retail CBDC architectures

Direct CBDC is a payment system operated by a central bank that offers retail services. The Central Securities Depository is a direct requirement of the central bank. The central bank keeps a book of all transactions and makes retail payments.

Direct CBDC attracts with its simplicity, as it eliminates dependence on intermediaries. However, this entails trade-offs in terms of reliability, speed and efficiency of the payment system. CBDC, created on the basis of the technical capabilities necessary for the consumer, can still yield to the attractiveness of modern retail payment systems.

Hybrid CBDC is an intermediate solution that runs on two engines. Intermediaries make retail payments, but CBDC is a direct requirement for the central bank, which also maintains a central ledger of all transactions and manages the backup technical infrastructure, which allows the payment system to be restarted in the event of an intermediary failure.

An intermediate CBDC is an architecture similar to a hybrid CBDC, but in which the central bank maintains only a wholesale ledger, not a central ledger of all retail transactions. Again, the CBDC is a requirement for the central bank, and private intermediaries make payments. In this case, we can identify this architecture with a hybrid.

In addition to these three generally accepted general-purpose CBDC architectures, another approach is to indirectly provide retail CBDC through financial intermediaries. We note that because this does not allow the consumer to have direct access to central bank money, not all central banks recognize this architecture as a general-purpose Central Securities Depository [37, 30, 130].

Indirect or synthetic CBDC is a payment system operated by intermediaries. Consumers have requirements for these intermediaries, who make all retail payments. These intermediaries need to fully cover all liabilities to retail customers with claims on the central bank [2, 79].

The second choice of technical project concerns infrastructure. The infrastructure can be based on a conventional centralized database or on new distributed registry technology. Based on the research of the CBDC of most central banks, we can say that the technology of distributed registers (DLT) is considered acceptable and optimal.

According to the Bank for International Settlements, DLT is a process and technology that connects network nodes to reliably offer, verify and record changes in the state of the system in accounting [53]. Table 2.1 compares DLT technology and classic databases.

Table 2.1. Comparison of DLT technology and the classic database

DLT	Classic database
Decentralized. There is no single verification center, everyone can verify any operation, which gives the system transparency and significantly reduces transaction time.	Centralized clearly defined number of people (administrators) responsible for the preservation and accuracy of information, which in turn increases the reliability, but the duration of the operation increases.
Stable / secure. Due to the encryption of information (cryptography) it is impossible to change the data, which eliminates the need for protection.	Vulnerable. The urgent need to protect personal data and the entire system.
Unmistakable. A longer period of storage in the registers provides confirmation to more participants. All data is subject to automatic verification.	Risky. A longer period of information storage provokes more risks for its storage.

However, even if you do not use DLT as the main infrastructure of the CBDC, the use of cryptography can still be useful.

The third choice concerns how consumers can access the CBDC. The first option is to follow the usual account model and

link ownership to identity (Figure 2.6, left). Such schemes can be a problem in some countries, thus undermining public access [6, 3].

The second option is for the central bank to meet the requirements only when the user of the Central Securities Depository demonstrates knowledge of the encrypted value - a digital token (Figure 2.6, right) [8].

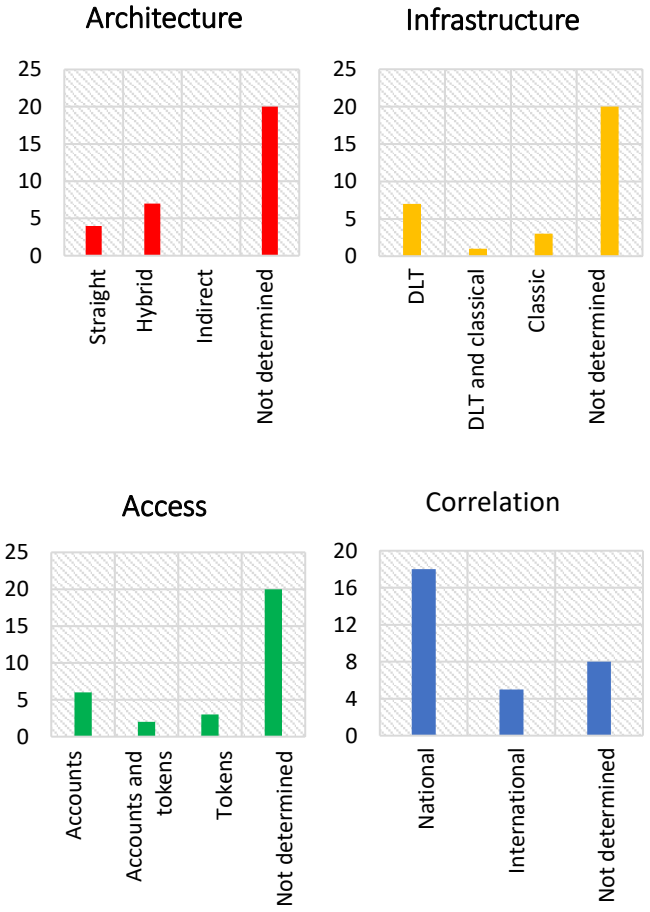


Figure 2.6 - Signs of current retail projects of the CBDC

A token-based system would provide universal access - as anyone can get a digital signature and would provide good privacy by default. It will also allow the CBDC to interact with communication protocols, to be the basis for micro payments.

However, the use of such a database can expand the list of potential risks. One is the high risk of losing money if end users are unable to keep their secret key. Moreover, there will be problems in developing an effective anti-money laundering and anti-terrorist financing system for such a system. Law enforcement agencies may face difficulties in identifying claim holders or tracking cash flows, as well as cash or bearer securities. Thus, retail CBDC need additional safeguards if they follow this path [73].

Once the configuration of the CBDC becomes clear, as well as how resident consumers can access it, the question arises as to whether it can be used only domestically or elsewhere. This is the highest layer of the CBDC pyramid.

Demand for integrated and inexpensive cross-border payments has grown in line with the growth of international e-commerce, remittances, and tourism.

An important aspect is that, depending on the design, the CBDC can facilitate cross-border payments from the outset [35], reducing inefficiencies and commissions by reducing the value chain of payments.

It is important that the extent of such retail relationships and their type depend on the national access system. If the national system is based on digital tokens, it will be available to foreign residents by default. If it is based on accounts, interaction can be a design choice that can also be coordinated internationally. Among the CBDC retail projects in our sample, we find a wide range of approaches to architecture, infrastructure, access, and cross-border (retail or wholesale) interconnections.

In terms of architecture, we find four central banks that consider a direct model (often to enhance financial inclusion). Seven are considering a hybrid or intermediary option (in some cases next to a direct option), and a larger group has not yet specified an architecture. None of the reports examined in this study indicate that the central bank is pursuing an indirect / synthetic architecture.

Figure 2.6 classifies the characteristics of the current retail projects of the Central Securities Depository [10].

In terms of infrastructure, we find seven central banks that use their prototypes on DLT, three with a classic database and one that takes both into account [119]. Among access methods, account-based access seems to be the most common to date: six central banks clearly lean towards accounts, and two more consider access to both accounts and tokens, and 3 central banks consider tokens, but most have not yet been identified.

As central banks play a key role in payment systems, the process of reducing the use of cash and related events in the private sector require them to “intensify” [26, 25].

We have demonstrated the importance of the central bank by examining the choices that may arise at the design stage of the CBDC and how the relevant decision-making process can be structured. In the process of research, we identified how consumer needs can turn into technical trade-offs. The analysis raises some design issues, such as the feasibility of using DLT compared to conventional technical infrastructure, but other options remain less clear at this time. And also, the fact that most central banks use models where the CBDC is a direct requirement for the central bank, but with private intermediaries.

Today, it is important for central banks to gain practical experience based on decision-making. The considered approach to the CBDC architecture examines current variations in technical design. Since most of the projects are still in the early stages, the most important thing is that the central banks

involved around the world are researching a rich set of prototypes covering almost the entire range of possible designs listed in the CBDC pyramid. By announcing the results of these experiments at the international level, a clearer picture will emerge of what technological choice is appropriate for the CBDC, and how the optimal design may depend on the specific circumstances of each country. This, in turn, can help start a debate on how and whether the CBDC should be issued at all.

2.3 Analysis of pilot projects on the example of China and Canada, comparison with the project "E-hryvnia"

In the above analysis, we conducted a study of the factors that affect the CEC. Central banks around the world have been researching the concept and design of digital currencies for several years. Figure 2.7 shows the chronology of pilot projects and reports on the CBDC [10].

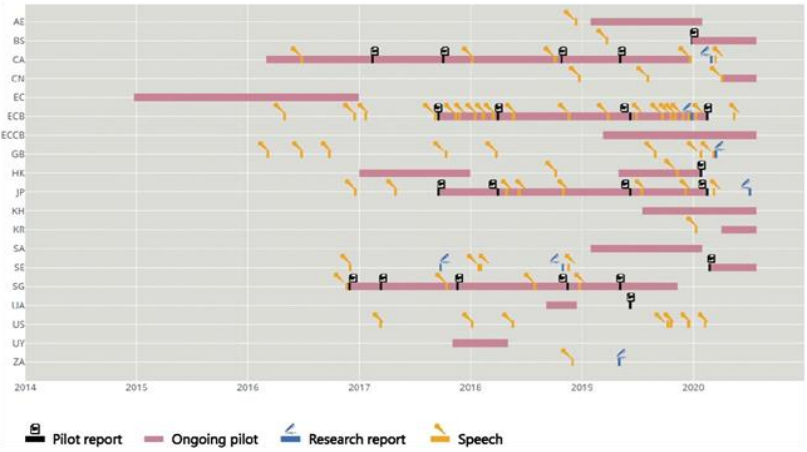


Figure 2.7 - Chronology of pilot projects in the world with the CBDC

As early as 2014, the Central Bank of Ecuador launched a project called Dinero electrónico (electronic money) to allow individuals to make mobile payments through a system managed by the central bank (Valencia (2015)). However, the system failed to attract a significant number of users and was discontinued in 2016. [152]

At the same time, with the growing popularity of bitcoins and distributed registry technologies (DLT), a number of central banks have launched internal projects to better understand DLT and its potential application to currencies.

Since 2016, a number of central banks have launched research projects on digital currencies for specific purposes. Thus, the Bank of Canada launched the Jasper project in early 2016 and published its first performance report the following year. The first publicly announced work on the retail CBDC was carried out by the Swedish Riksbank [137].

As of mid-July 2020, at least 36 central banks had published their surveys on wholesale or retail CBDC. At least three countries (Ecuador, Ukraine, and Uruguay) have completed a retail CBDC pilot project. Six CBDC retail pilot studies are ongoing: in the Bahamas, Cambodia, [22] China, the East Caribbean Monetary Union, Korea, [14] and Sweden.

At the same time, a growing number of central bank executives and board members made public speeches about the CBDC. In 2017 and 2018, many of them had a negative or contemptuous position, especially regarding the retail CBDC. Since the end of 2018, the number of positive mentions of retail and wholesale CBDC in speeches has increased, and today there are more speeches with a positive than a negative position (Figure 2.8) [10].

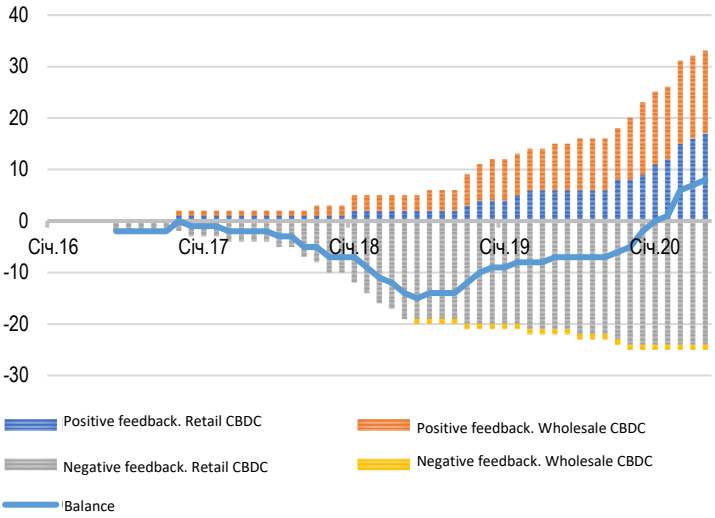


Figure 2.8 - Dynamics of public speaking in relation to the CBDC

According to the above statistics, PricewaterhouseCoopers (PwC) developed an international CBDC index in April 2021. The purpose of this index is to provide an overview of the development of the Central Securities Depository around the world. The main variable is the status of the CBDC project, which indicates the current stage of project development. The more advanced the CBDC project, the higher the score. In addition, bonus points are awarded based on the duration of the respective pilot projects to simulate project progress.

The other two variables capture the central bank's position based on published speeches and public confidence (Google Trends or Baidu Index). This index is independent of architecture: the choice of design of each country (infrastructure, technology, etc.) does not affect the index.

Thus, PwC gives the following ranking of countries, Figure 2.9 and 2.10 [28].

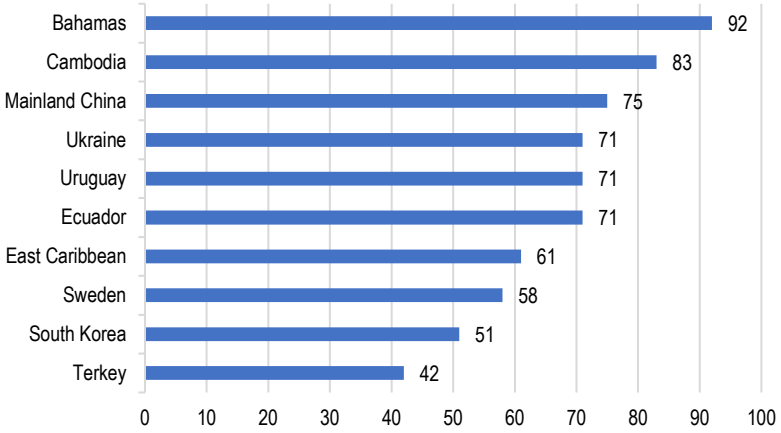


Figure 2.9 - Top 10 retail CBDC projects

As we can see, the top three leaders are led by the Bahamas with the Sand Dollar project and Cambodia by the Bakong project. The Digital Yuan project in mainland China has already reached an advanced level of testing, with transactions worth more than 2 billion yuan (~ $ 300 million) and is reportedly preparing for wider use at the 2022 Beijing Winter Olympics.

CBDC progressive interbank / wholesale projects have, on average, a shorter research phase than retail programs, but a longer pilot phase.

It should be noted that currently there are no real projects, at the same time, there are very advanced pilot initiatives in countries such as Thailand, China and Singapore.

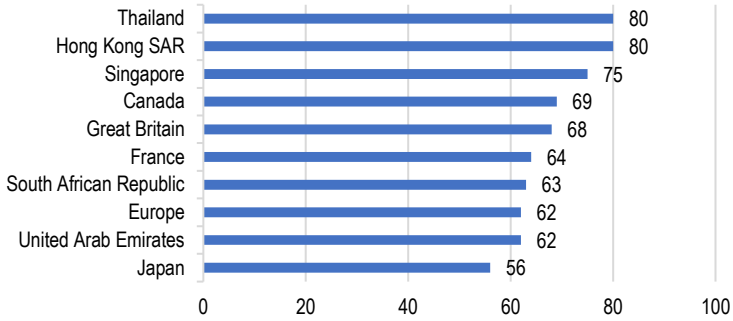


Figure 2.10 - Top 10 wholesale projects CBDC

In addition, we propose to consider in more detail three approaches to the CBDC, one each in Asia, North America and Europe, namely the project of the People's Bank of China on digital currency electronic payments (DC / EP); the Bank of Canada's work on the Central Securities Depository as a contingency plan, and a pilot project of the National Bank of Ukraine to issue e-hryvnia.

Among all current CBDC projects, the People's Bank of China (NSC) project is considered the most modern. [33].

In China, the introduction of the CBDC is provoked by the country's high-digital economy and the widespread use of private digital payment services among residents. The introduction of the CBDC in the most populous country and the second largest economy can have far-reaching consequences. In addition to providing a convenient addition to cash for online transactions, the CBDC will also add more diversity to the current mobile payment duopoly of Alipay and WeChat Pay, which together control 94% of the mobile payments market. If it is decided to go beyond the current pilot phase, DC / EP will complement M0, which includes banknotes and coins, as well as central bank deposit accounts. It is not intended to completely replace physical cash.

Figure 2.11 describes the main design characteristics of DC / EP, according to the pyramid of the Central Bank. The architecture of the current DC / EP pilot project is a "hybrid CBDC" model: the is a direct requirement for UAH, but real-time commissioning and payment services are provided by intermediaries (called "authorized operators"). The central bank periodically receives and stores a copy of retail payments and transactions.

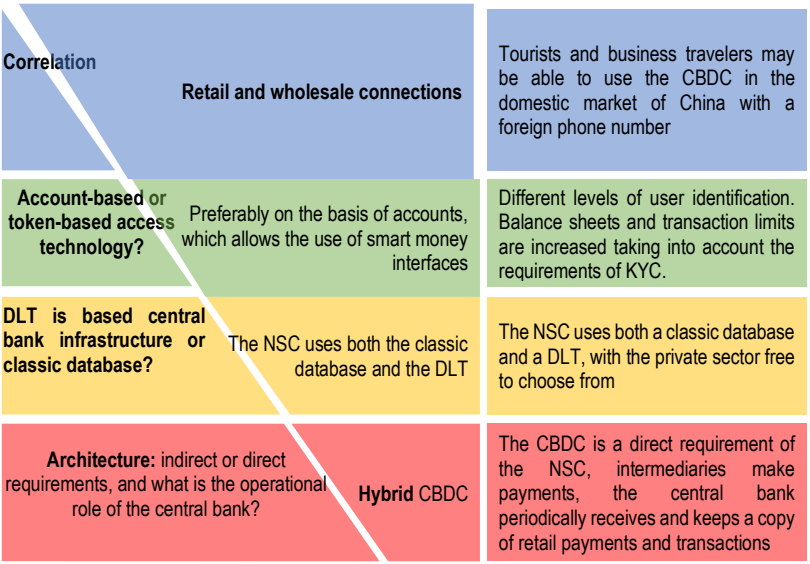


Figure 2.11 - Characteristics of the DC / EP pilot project of the People's Bank of China

The basis of the DC / EP infrastructure will be a mixed system with a regular database and DLT. However, the DLT-based database is still underdeveloped for use in this field. To make transactions, any system must be able to accept 300,000 transactions per second to service retail operations in China.

Regarding access, the NSC decided to use a hybrid payment instrument based on value, on the basis of half-accounts and

invoices. The identity will be based in such a way that users can use DC / EP anonymously, but "operating agencies must timely submit transaction data to the central bank through asynchronous transmission". This will ensure anonymity to each other but will allow the central bank to "keep track of the data needed to reasonably regulate and combat money laundering and other criminal offenses, as well as reduce the burden on commercial banks" [55].

Wallets are based on various forms of identification, not all of which must contain a name and other personal information. To provide different levels of anonymity and user access, there are several classes of digital wallets based on the strength of KYC levels, with more stringent requirements for higher transaction limits. Restrictions are usually related to existing rules for the use of banknotes and coins; details, however, have not yet been established.

Finally, in terms of international interconnections, DC / EP will be connected to existing retail and wholesale systems, including the RTGS system. The main purpose of DC / EP is internal retail use. However, if an agreement can be reached with foreign jurisdictions, non-residents (such as tourists and business travelers) can access the DC / EP with a foreign entry-level cell phone number.

The exact launch date remains unclear. Intergovernmental coordination can be useful in ensuring harmonized standards abroad.

The Bank of Canada has conducted significant research and public speaking on digital currencies. Carolyn A. Wilkins [153], Senior Deputy of the Bank of Canada, was one of the first to express a positive view of the CBDC.

Despite its early start, the Bank of Canada did not report that it was developing a retail CBDC pilot project or proof of concept. Instead, he outlined a comprehensive plan for the conditions under which Canada should develop the CBDC. He

also identified potential architectures and accumulated relevant technical knowledge through several new payment technology projects, also in collaboration with other central banks [108].

In particular, the Bank of Canada considered: first, a scenario in which the use of physical cash is completely reduced or stopped altogether, and second, a scenario in which private cryptocurrency or stablecoin begins to be actively used as a means of payment. To prepare for such cases, the Bank of Canada conducts stakeholder discussions by working with universities and firms to develop CBDC.

If the CBDC needs to be developed, the overall goal of the project will be a direct requirement to the Bank of Canada that mimics the properties of physical cash as accurately as possible. The CBDC will not replace cash but is designed as a digital addition with beneficial features of sustainability and affordability.

As the overall goal of the project is quite clear, the Bank of Canada has also identified architectural element.

First, the CBDC will be a "Canadian dollar requirement for the Bank of Canada" [119], no indirect / synthetic approach. The scrapbook presents three potential architectures corresponding to the "direct CBDC" (Bank of Canada, which provides the entire CBDC payment system) and the "hybrid CBDC" (only the Bank of Canada issues and repurchases the CBDC, with private sector intermediaries providing services to end users) or "intermediate CBDC"(identical to the hybrid model when the Bank of Canada does not have access to the full transaction book).

Details of the infrastructure have not yet been spelled out. The Bank of Canada has experience with several new DLT-based payment projects. However, he notes that while DLT may be possible as an infrastructure solution, it is by no means necessary.

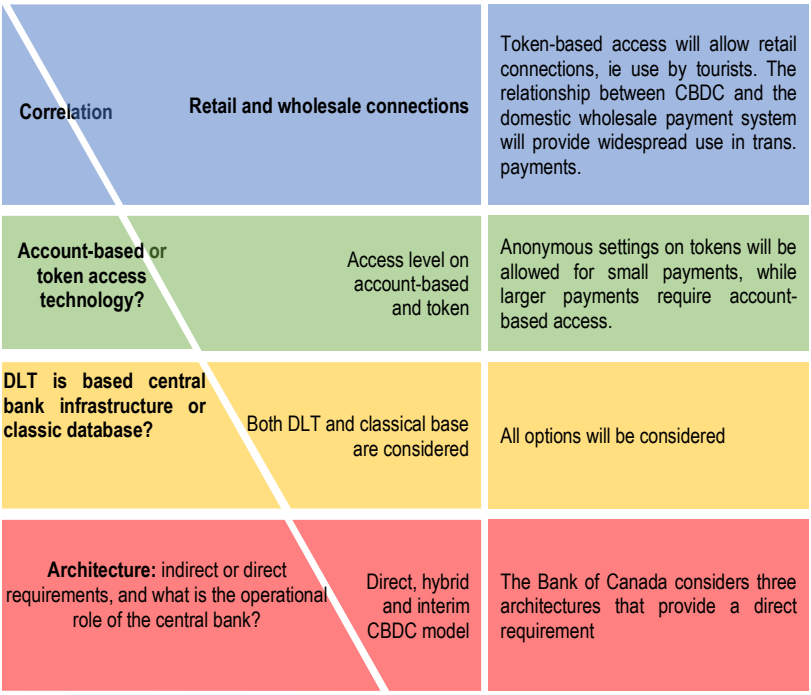


Figure 2.12 - Characteristics of the Bank of Canada pilot project

Solutions for access to both accounts and tokens will be considered, possibly with levels: anonymous token-based options will be acceptable for lower payments. This can be achieved with an inexpensive special universal access device (UAD) [49], which will allow users without a smartphone to use the CBDC. Larger purchases require account-based access. The levels will be chosen so that the fight against money laundering and related problems are not more serious than today. Given the new opportunities for illicit use opened up by programmed money, achieving the same level of enforcement may require reducing the definition of "large" payment [3].

With regard to retail relationships, while the focus of the CBDC will be on the domestic market, the possibility of using a CBDC based on tokens naturally makes the system available to tourists and other non-residents for retail payments. Again, the overall design of the system will be such that the issues of international use and control over foreign capital will not be more serious than in the current system based on money.

The pilot project of the National Bank of Ukraine "E-hryvnia" on the possibility of issuing its own digital currency based on blockchain technology has been running since 2016. Its practical part was completed in late 2018. A prerequisite for the development of the project was to increase the volume of payments through payment systems and the spread of the use of non-cash payment methods among Ukrainians [5].

As part of a pilot project, the regulator explored how the electronic UAH could complement Ukraine's payment landscape and help increase the share of non-cash payments and reduce their value.

CBDC was considered as an alternative means of making electronic payments for small payments, in particular by individuals, ie as a retail CBDC.

Prior to the final decision on the design, the Central Bank of the NBU conducted a study of possible options. The structural elements of the E-hryvnia project are shown in Figure 2.13.

The architecture chosen by the NBU is the "hybrid CBDC", which assumes that the issuer of the electronic hryvnia is the National Bank. Electronic wallets are registered in one centralized register of the Platform, the owner and operator of which is exclusively the National Bank. The decision to enter any transaction in the register (transaction verification) is made only in the information resources of the National Bank of Ukraine.

However, other banks and non-bank financial institutions under this scheme are agents of clearing and distribution of

electronic UAH, provide users with access to the Platform through their Internet resources, provide customers with other services: secure key storage, shared access to mobile applications, convenient information on customer transactions.

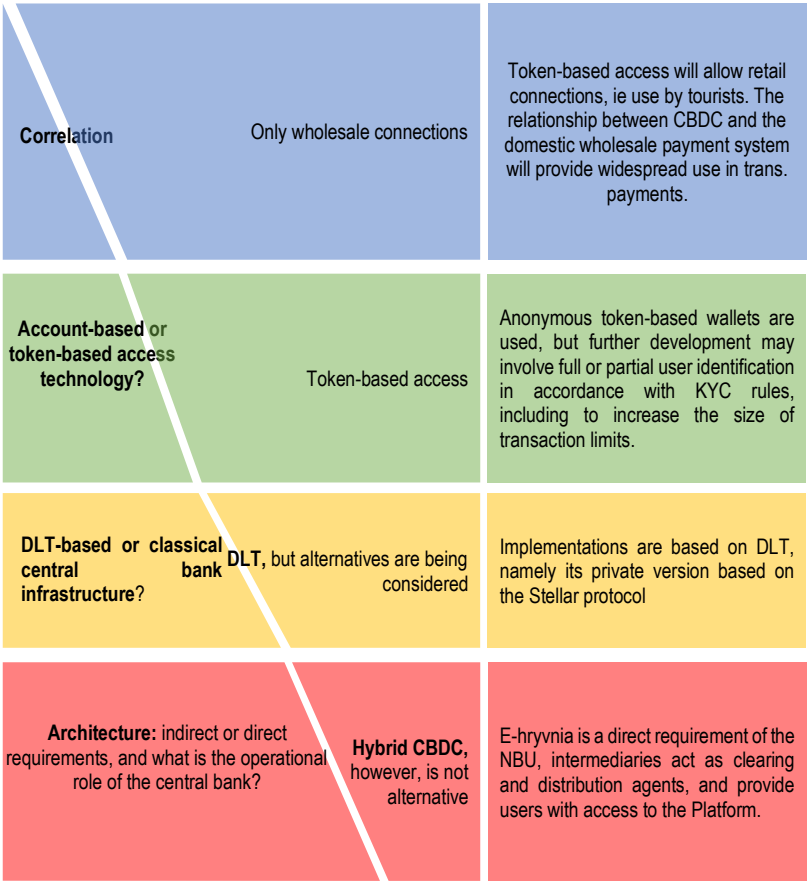


Figure 2.13 - Characteristics of the NBU E-hryvnia pilot project

The infrastructure and technical implementation are based on DLT, namely its private version based on the Stellar protocol, but was not recognized as mandatory. With regard to access technology, the Central Bank of the NBU pilot project used anonymous e-wallets based on tokens, but further development of e-hryvnia may involve full or partial identification of the user in accordance with KYC rules, including to increase transaction limits. Further introduction of the e-hryvnia should consider the requirements of the AML / FATF regarding the restrictions on the balance of the e-wallet and the volume of transactions.

In terms of interconnections, the main purpose of using the e-hryvnia is internal functioning, but if the NBU introduces the Central Bank based on tokens, it will automatically expand its boundaries.

Based on the analysis, we found that the CBDC has been potentially considered by central banks since 2014. During this period, the number of countries has grown to 36, and the negative attitude is declining every year and today there are many more positive responses.

It is also important to note that CBDC projects vary from country to country in terms of motivation as well as economic and technical design. To better understand these differences, we focused on three advanced cases, namely the National Bank of China, the Bank of Canada and the NBU's domestic study.

Approaches will differ according to economic conditions and user priorities. In countries where digital payments are already highly developed and cash use is declining, central banks can respond to the provision of public sector always means of payment. In countries with lower digital penetration rates, financial inclusion can be an important factor. The choice of architectures, infrastructure, access, and connections will be adapted to local conditions.

However, our review also showed some key commonalities. None of the projects we have considered is intended to replace

cash; all designed to complement it. Most of them still have a strong role of intermediaries with the possibility of providing some services in parallel by central banks. None of the projects uses an indirect model where the CBDC is a requirement for intermediaries rather than central banks. We believe that by exchanging information on drivers, approaches and technologies, central banks can learn from each other, thus complementing international policy work in this area.

In the future, events such as the Covid-19 pandemic emphasize the value of access to a variety of means of payment and the need for any method of payment to be both accessible and resistant to a wide range of threats. Although it is difficult to predict the range of future risks, central banks will continue to take a long-term view and carefully consider the role of the CEC in several potential future scenarios.

As for comparing the NBU pilot project with others, we can obviously say that Ukraine is moving in the right direction, but the scale of the study does not yet allow us to fully assess the situation in the financial market in the future. However, the full implementation of the project requires both a significant amount of investment and changes, including legislation.

2.4 Potential opportunities and risks of using CBDC, ways to minimize risks

There is a large and diverse number of opportunities that determine the interest of central banks in the Central Securities Depository. For central banks that are currently developing pilot projects, the primary motivation for research is the use of the CEC as a means of payment, although there are secondary reasons (for example, the strengthening of monetary policy instruments).

One of the potential uses of the CBDC is uninterrupted access to central bank money. In countries where the use of cash is

declining, there is a danger that households and businesses will no longer have access to risk-free central bank money. Some central banks consider it an obligation to provide public access, and that this access can be crucial to the credibility of the currency. The CBDC can be used as a “digital cash equivalent” and can fulfill this obligation.

With the help of the CBDC it is possible to increase the variety of payments. Payment systems, like other infrastructures, benefit from strong network effects that can lead to concentration and monopoly or, conversely, to fragmentation. Payment service providers have an incentive to organize their platforms as closed systems. In this case, if a small number of systems dominate, there may be high barriers to entry and high commissions (especially for merchants). Where there are more systems, fragmentation occurs. Fragmentation of payment systems means that users and sellers may face additional costs and difficulties in paying users of other systems [39] This is inconvenient and socially inefficient. The CBDC can provide a common method of transfer between fragmented closed loop systems (although an available fast payment system can also achieve the same effect).

The CBDC is an opportunity to improve financial inclusion [21]. For project-developing central banks, most of the adult population has easy access to electronic payments. However, increasing digitalization may leave some segments of society behind, as potential barriers to trust, digital literacy, access to IT, and data privacy issues create a digital divide.

Given the complexity of the issue and the possible major barriers to digital inclusion (illiteracy), any CBDC initiative is likely to require a broader set of reforms [105]. Another advantage is the improvement of cross-border payments. Cross-border payments are inherently more complex than purely domestic ones. They cover more users, different time zones, countries, and conditions. As a result, they are often slow,

opaque, and expensive. A universal CBDC (one that is essentially compatible with others) can play a role in improving cross-border payments.

Supporting public privacy. A key feature of cash is that there are no centralized records of account balances or transactions. Some argue that the main benefit that the CBDC can bring will be a certain level of anonymity of electronic payments [15].

Complete anonymity is unlikely. Although the fight against money laundering and the fight against terrorist financing (AML / CFT) is not the main goal and motivation for issuing CBDC, central banks are expected to develop a CBDC that meets these requirements (with any other regulatory expectations or disclosure laws).

Payment data will be available for the Central Bank Digital Currency (CBDC) and its system, and a key national policy issue will be to decide who can access the database, which parts of it and under what circumstances, and reducing illegal activity will require clear coordination with relevant domestic authorities (e.g. tax authorities).

Regarding monetary policy opportunities, the CPMI-MC [40] provided a detailed overview of the conceptual possibilities of using the CBDC as a monetary policy tool. Theoretically, such a CBDC can immediately notify changes in interest rates to owners. However, outside of theory, there are problems and dangers. In order to use the CBDC effectively, it is necessary to accrue interest and allow the population to keep large sums. This may increase the risks to financial stability associated with withdrawals from banks and increased volatility in cash flows.

In addition to the interest rate, there was also a public discussion on the use of the CBDC to stimulate aggregate demand through direct transfers to society (so-called helicopter drops), possibly combined with a programmed monetary policy (e.g. transfers with an expiration date). or subject to the cost of

certain goods). However, the key issue for these transfers is the identification of recipients and their accounts.

Despite the fact that CBDC (depending on its design) provides a number of opportunities for monetary policy, it will not be the main motivation for the issuance of the CBDC.

Although it is widely acknowledged that retail and / or wholesale trade will bring efficiency and benefits to the economy, it is still a new concept that raises many open questions and risks. Particular attention should be paid to regulatory aspects before moving forward with the development of digital currencies.

We have summarized the various risks as follows:

Data Confidentiality: Private data can potentially be exposed to individuals with digital money, especially in the case of retail tokens. Thus, the storage of large amounts of data in a centralized system is always questionable. For example, depending on the country, will some central banks be allowed to share transaction data with other government agencies? And will the CBDC be used as a tracking tool to monitor the consumption habits of a certain part of the population?

Cybersecurity: Given the growing prevalence of cyber attacks over the past few years, security should be a key component of the CBDC system. And while cyber threats are already part of the risk for current payment, clearing and settlement systems, the introduction of a retail CBDC will pose a completely different challenge to cyber resilience, especially since such a CBDC model is likely to be open to a very large number of participants. Which in turn can make the system more vulnerable as it provides many points of attack. Therefore, a sound risk mitigation mechanism will be a prerequisite for any central bank wishing to issue a foreign CBDC.

Much academic research has been conducted on the risks of disintermediation, from the flow of money from the banking system to the central bank. In this case, the central bank must

have reliable means to mitigate any risks to financial stability prior to the issuance of any CBDC.

Adoption of a foreign CBDC also has significant risks and challenges for the national financial system. Significant acceptance of money not denominated in the sovereign currency may limit the impact of monetary policy or the ability to maintain financial stability. The risk of stable coins, so-called cryptocurrencies and foreign CBDCs, is that domestic users accept them in large quantities, and the use of the national sovereign currency decreases. In extreme cases, with such digital dollarization the national currency can be replaced by another, and the domestic central bank gradually loses control over monetary issues [24; 70]. By offering an efficient and convenient national foreign CBDC, the central bank can reduce the risk of dominance of alternative account units. Alternatively, the central bank may cooperate with domestic private payment service providers to ensure maximum efficiency and suitability of the internal payment system for its purpose.

Legal and regulatory risks should also not be underestimated. In this context, two key issues have been identified:

– Is the central bank allowed to issue CBDC? If so, what are the other legal implications of issuing this type of currency? In the EU, the ECB currently relies on its mandate on price stability in the issuance of banknotes and coins. However, it can be argued that the CBDC issue will not be a significant technological improvement, as it may provide central banks with new instruments in terms of negative interest rates or wider access to transaction data.

– The issuance of a retail CBDC may add new levels of legal complexity arising from possible banking intermediation. Indeed, if central banks issued CBDC to households, deposits in commercial banks would decrease, which would lead to a decrease in the issuance of commercial loans. Ultimately, the central bank would centralize credit, giving the public access to

its balance sheet. In this case, the legal consequences are significant, especially in the EU, as such centralization would be significantly contrary to an open market economy with free competition, a key principle of the Treaty on the Functioning of the European Union, which the ECB must adhere to.

It is especially important to understand that the adaptation of current payment systems or the construction of a new system from scratch will significantly affect the current operating model. Even small changes in what underlies the day-to-day economic activities of banks and individuals can have a significant impact on the reliability and availability of payment systems. The technological and operational model based on the CBDC should not be misunderstood, as the ultimate goal should be to provide a reliable and constantly available payment system in real time with the involvement of stakeholders from different jurisdictions.

To prevent the above risks from the issuance of the Central Securities Depository, the National Bank of Ukraine proposes the following actions [5]:

– first, an important role is played by the CBDC model, which will correspond to the ultimate goal of the central bank and its strategic goals;

– secondly, CEC should meet consumer expectations and evoke only positive associations, which can be achieved through harmonization with fiat money;

– thirdly, the development and implementation of CBDC is a rather complex and resource-intensive process, and therefore involves a joint effort between participants in the financial and banking markets, but not only at the national level but also internationally.

3 TRANSPARENCY OF FINANCIAL RELATIONS IN THE CONDITIONS OF DIGITALIZATION

3.1 Digital preconditions for transparency of financial services in Ukraine and the world

The digitalization of financial services helps to fill gaps in the work of traditional financial institutions and significantly increase their efficiency. Traditional financial institutions tend to provide services through conventional institutions and rely on outdated technologies that are expensive to operate and even more expensive to upgrade and adapt to the rapid development of technology.

As for financial services, digitalization has changed the business model of most organizations working in all areas of the industry. So let's consider which innovations are most popular in the following financial services:

- **trade in currency values**

The era of cryptocurrencies began with bitcoin, which provided the basis for cryptocurrencies and the current implementation of the blockchain. Digitalization of markets now goes far beyond the primary idea of sing bitcoins. As is often the case with new technologies, the full scale of market influence is associated with the development of blockchain technology, cryptography and smart contracts.

The acceptance of cryptocurrency is growing worldwide. As of 2021, global cryptocurrency ownership averages 3.9%, with more than 300 million cryptocurrency users worldwide. And more than 18,000 companies are already accepting payments for cryptocurrency [143].

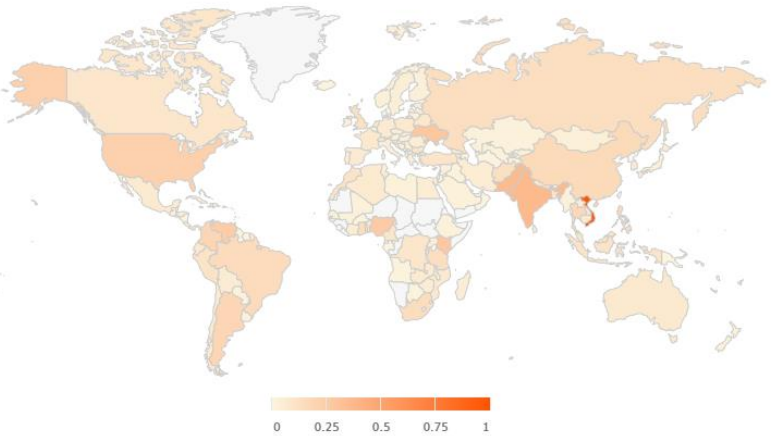


Figure 3.1 – Global cryptocurrency acceptance index (period from July 2020 to June 2021) [32]

Of the 154 countries analyzed, less than 20 have a rating of zero or close to it (Fig. 1 [32]). It indicates the excitement surrounding cryptocurrencies as an investment, especially in developing countries, as a means of storing value and a means of exchange.

Table 3.1 – Leading countries in the number of owners of cryptocurrencies [143].

№	Country	Crypto owners	% people
1	Ukraine	5 565 881	12,73%
2	Russia	17 379 175	11,91%
3	Venezuela	2 941 502	10,34%
4	Singapore	549 903	9,40%
5	Kenya	4 580 760	8,52%
6	USA	27 491 810	8,31%
7	India	100 740 320	7,30%
8	South Africa	4 215 944	7,11%
9	Nigeria	13 016 341	6,31%
10	Colombia	3 122 449	6,14%

We can conclude that developing countries have a high level of public awareness about cryptocurrencies. This can be explained by the presence of economic stability in some regions, which encourages the population to seek alternatives to save their savings. Others in these areas use cryptocurrency to make international transactions, both for individual remittances and for commercial uses, such as buying goods for import and sale.

Ukraine is the leader in the number of cryptocurrency holders per unit of population, so the percentage of cryptocurrency holders is 12.73% [143]. We can conclude that Ukrainians are very open to working with cryptocurrencies. And if we talk about global statistics, as of September 2021, the total market capitalization of cryptocurrencies is about 2.2 trillion dollars [42].

- **attraction of financial assets with the obligation to return them later; lending, including on the terms of a financial loan**

A new stage that has increased the level of interaction between the financial sector and the ecosystem and the client was digital lending - online lending using remote identification using digital technologies. The use of digital lending has significantly improved the quality of decision-making, reduced execution time and saved the cost of loan applications and approval. On average, applications for corporate loans for small and medium enterprises are processed within a few working days with digital lending instead of 3-4 weeks without it. For example, in the pre-war 2019 period, the volume of loans issued amounted to UAH 77.2 billion, and in 2020, creditors have already received UAH 88.7 billion [4].

- **financial leasing**

The use of big data by financial and leasing companies can lead to a better and more complete understanding of customers, competitors, markets, products, services and channels. In addition, big data analysis allows for more efficient decision-

making because it provides transparency through the analysis and transmission of critical data across networks that can provide a deeper understanding of the organization.

Big data can allow financial and leasing companies to assess potential new market opportunities, develop new products and services, increase customer satisfaction and, therefore, maintain customer retention.

- **financial payment services**

Digital payments are still the most common tool for expanding access to financial services and can be expected to accelerate in the post-COVID pandemic.

Mobile transfers have become one of the first solutions in the field of financial technologies for payments and still occupy a leading position in terms of their popularity in developing countries. Digital online payments are more common in developed economies and some emerging markets.

According to global research and Ukrainian statistics, the increase in the number of mobile device users and the strong growth of e-commerce contribute to the rapid adaptation of digital payments around the world and in Ukraine.

WORLD The total volume of digital payments in 2020 amounted to 5.2 trillion dollars. In 2023, the figure is projected at 6.7 trillion dollars [51].

EUROPE The European digital payments market will reach a record $ 802 billion and will grow by 9.9% compared to the previous year. By 2023, the market will reach $ 1 trillion [72].

UKRAINE The total number of transactions (non-cash and cash) using payment cards issued by Ukrainian banks in the first half of 2021 amounted to 3,598.3 million units, and their amount – UAH 2,305.9 billion. Compared to the same period last year, the number and amount of these transactions increased by a third (31.2% and 29.2% respectively) [133].

- **in the field of insurance**

In the insurance industry, computers can automate post-incident data collection, analyze accident photos, and perform many other functions that reduce the time and money insurers need to settle claims. In insurance, AI technologies have the potential to make almost everything from customer service and fraud prevention more effective. Modern insurance companies use AI to better analyze data and provide more personalized services based on them. With this technology, a company can access customer data through smart devices, location sensors, site sensors and geographic information systems. In this way, insurance companies can consider the characteristics of each individual client and enter into flexible contracts that meet the needs of the client. AI is expected to save the industry $2.3 billion by 2024 [67].

Another technology for solving insurance problems is the blockchain, a tool that can help insurers reduce the administrative costs associated with handling claims and verifying payments made by third parties. Blockchain provides data exchange and at the same time reliable protection against fraud. All information in the distributed book is registered as interconnected blocks. This provides tracking, which simplifies verification. Cryptographic protection methods make the technology highly reliable for data storage and transmission. Its benefits, such as transparency, security and consistency, make it attractive to many industries.

- **activity in the system of accumulative pension provision**

The digitalization of the pension system is mostly done through the development and promotion of digital applications with a system of education for retirees and special training to work with them.

Electronic applications and virtual services help to overcome the human factor, queues, corruption. To this end, the Pension

Fund of Ukraine in recent years has launched several important services of its own web portal for all, without exception, the categories of people it serves. The electronic platform is constantly being upgraded. Another important step was the development of a mobile application Pension Fund, in which you can access information on pension insurance and benefits.

- **banking and other financial services provided in accordance with the Law of Ukraine "On Banks and Banking"**

The digitalization of banks can lead to a wide range of benefits, such as increased business efficiency, increased accuracy, reduced costs, increased security and competitive advantage. One of the areas of digitalization of the banking system, which has become almost mandatory with the development of technology, is mobile banking. Access to the mobile application provides security, convenience and ease of access. Its main advantages are the speed of money transactions, the ability to remotely conduct financial transactions 24/7, a wide range of services, automatic payment functions and a minimum fee for financial transactions.

Mobile banking also provides certain benefits for the banking industry itself, such as lower costs, greater return on investment, increased security and the ability to more easily collect customer analytics.

Statistics of mobile banking applications show that the mobile applications market is projected to earn $ 693 billion from downloading in 2021. Mobile applications have become an integral part of the lives of generations who own technology. Online finance statistics show that in 2020, 244.2 billion applications were downloaded. In the European market, the UK is a leader in mobile payments, and 74% of its population uses mobile devices to manage their finances. If we talk about Ukraine, the most popular mobile applications are Privat24 with 13 million active users and Monobank with 3.5 million [71].

The difficulties of recent years have led to many changes in the processes of digitalization of banks. Tasks related to remote work and remote services came to the fore. In addition, other areas are developing more and more popular in banks are AI-based solutions and the need for data analysis is growing.

One of the main opportunities for AI for the development of the banking sector is the development of chatbots, which are projected to help save on operating costs in financial services, processing customer requests automatically up to $ 7.3 billion. until 2023 [13].

Also, banking leaders are paying more and more attention to the introduction of cloud technologies to stimulate innovation and find new opportunities to optimize the organization, reduce infrastructure costs, increase business efficiency and increase shareholder profits. In the coming years, banks will implement hybrid and multi-cloud models to support their business strategy and meet their specific requirements. The cloud influences key trends that can be used to solve some tasks, such as:

- increase of operational stability;
- expanding the capacity of financial institutions to ensure data security;
- improving the connection of software infrastructure in financial services institutions;
- support for new products and services.

Today, according to a Harris Poll survey of the 1,300 financial services leaders in the United States, Germany, the United Kingdom, France, Canada, Australia, Japan and Singapore, the majority (83%) are already implementing cloud technologies as part of their core computing infrastructure [156].

3.2 Transparency of the budget process: world best practices

Guided by the need to improve budget openness, Ukraine should make full use of available materials in this area. Leading international organizations: the International Monetary Fund, the World Bank, the Organization for Economic Cooperation and Development, and the Organization for International Budget Partnership are working to increase the transparency of the budget process. The methodological materials developed by these organizations are in the nature of recommendations and are implemented by countries voluntarily in order to improve fiscal policy.

Significant developments in the formation of a transparent financial system have international financial institutions that analyze the current state of functioning of economic systems, summarize best practices and form general recommendations.

The studies of the International Monetary Fund are essentially substantial. The organization notes that transparency is one of the most important elements of fiscal management and accountability of the state. A sufficient level of transparency makes it more likely that the government will monitor the current state of the budget system, considering long-term prospects as well as potential fiscal risks that may prevent them from being achieved. Another important point is to provide citizens with a sufficient level of information about the use of budget funds. The IMF's work is part of efforts to increase fiscal oversight, support the chosen transparency course, and improve financial reporting.

Transparency in the fiscal sphere is a key component of good governance, which plays a significant role in achieving macroeconomic stability and long-term growth. In general, transparency involves the provision of comprehensive and reliable information on the previous, current and future state of

public authorities, and the openness of this information contributes to its analysis and consideration in making informed and quality management economic decisions. Improving the transparency of the fiscal sphere is an important goal for all countries, regardless of the level of economic development.

Among the main reasons for the need to increase the level of transparency, the IMF identifies the following [69]:

– the possibility of more informative discussions between the public and the authorities on the structure of the budget, the results of its implementation, budget policy measures;

– identification of the area of responsibility for the implementation of budget policy;

– the possibility of early detection of potential risks of the fiscal sphere and the corresponding possibility of making early adjustments to the policy in accordance with changes in economic conditions, which potentially reduces the frequency and severity of crisis situations;

– strengthening confidence in the budget contributes to the growth of stability in the financial market;

– the possibility for public authorities to gain access to international capital markets on more favorable terms.

The main tasks of the IMF, as an international financial organization, are to ensure the stability of the international financial system and promote the sustainable development of individual regions and national economies. The IMF also provides assistance to countries with balance of payments deficits and provides comprehensive support in the areas of fiscal capacity growth and anticipation of potential financial problems.

Regular systematic assessment of budget transparency is a relatively recent phenomenon. As a result of the Asian financial crisis of 1997-1998, the IMF published for the first time a “Code of Good Practice for Ensuring Transparency in the Fiscal Sphere”. In the following years, it was revised 3 times: in 2001,

2007 and 2014 [69]. This code is a global standard for public disclosure. In general, there are four basic principles of the budget and tax sphere: clarity of functions and responsibilities, openness of budget processes, availability of information to the public and guarantees of reliability.

In addition to the proposed basics of the Code of Good Practice for Fiscal Transparency, the IMF has issued a more detailed manual on the rules for assessing financial transparency [83], which initiated the IMF's assessment of countries' financial transparency through ROSC compliance reports. As part of these studies, IMF experts assess the degree of compliance with the principles of transparency. To date, more than 100 countries have requested an assessment in the framework of a policy dialogue with the IMF to identify transparency efforts.

According to the IMF criteria, the availability of a sufficient level of transparency in public finances makes it possible to ensure that the government's economic decisions are based on an accurate picture of the state of finances, considering the possible economic consequences. Also, a sufficient level of transparency enables various entities (public administration bodies, citizens, business entities) to receive a sufficient level of information to control the activities of government bodies. Increasing the level of openness provides opportunities to strengthen confidence in the state budget in the process of meeting the needs of the population.

The assessment of transparency according to the IMF methodology is a certain international standard for disclosure of information on the state of public finances, which is summarized in the document Fiscal Transparency Code. The Code includes 4 key "pillars" of transparency: financial reporting; planning and forecasting; analysis and management of financial risks; management of revenues from natural resources. The first 3 elements (financial reporting; planning and forecasting;

financial risk analysis and management) were developed by the IMF in 2014, and the element of natural resource income management was included in the methodology in 2019 after public discussions and field trials. The latter is especially relevant for countries that are rich in natural resources and are an additional way to reveal the level of transparency. Let's summarize the characteristics of the existing "pillars" of transparency for the IMF in the form of table 3.2.

Table 3.2 – Characteristics of the "pillars" of transparency for the IMF [62]

Group	Characteristics
1. Financial Statements	Financial statements should include a comprehensive, up-to-date, timely and reliable overview of the financial condition and performance of government.
2. Planning and forecasting	Planning and forecasting of budget indicators should meet clearly defined goals of the government, as well as be carried out in a timely manner and in full to obtain a promising state of public finance.
3. Analysis and management of financial risks	Anticipation, analysis and risk management of public finances should be the basis of an effective mechanism for managing public financial resources
4. Management of income from natural resources	State revenues from exploration, extraction and transfer of rights to extract natural resources should be collected and managed in a transparent manner.

The considered "pillars" of transparency are evaluated in accordance with the existing principles of openness. Each of the proposed principles of transparency has a characteristic in accordance with 3 levels, which characterizes it: basic, good, developed. This division provides countries with clear guidelines on how to work to ensure full coverage of the principles of transparency. Summarize the existing principles of IMF openness for assessment in the form of Figure 3.2 and a detailed description in Table 3.3.

The basic principles of IMF transparency have been developed on the basis of generalized experience and broad participation of partner countries, international organizations, and civil society organizations.

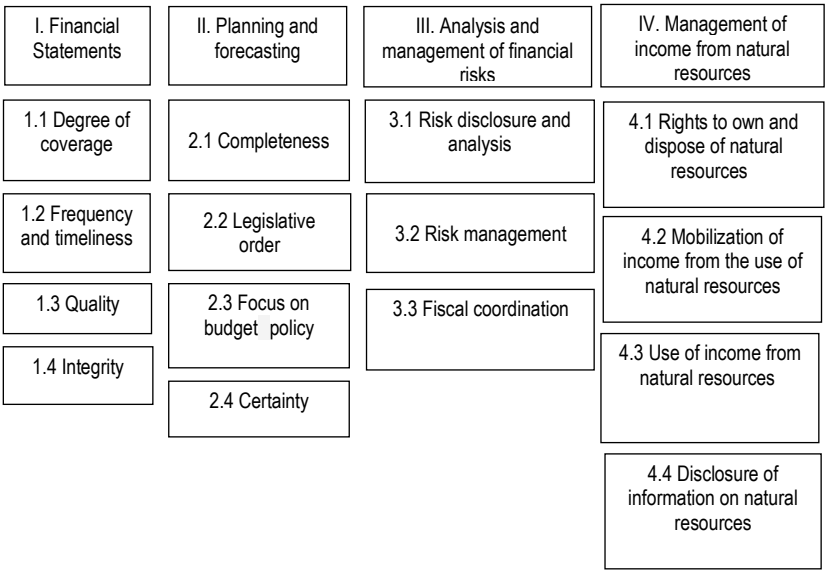


Figure 3.2 - IMF financial transparency pillars [62]

Table 3.3 – Additional IMF tools for assessing individual areas of transparency [68, 112, 111, 132]

Tool	Characteristic
Handbook of Government Finance Statistics (GFSM)	International recommendations on standards for maintaining, collecting and summarizing public finance statistics.
Evaluation of public investment management (PIMA)	A tool for evaluating the activities of decision-making institutions in the process of working with public investment at the stages of planning, distribution and redistribution by areas, implementation of investment

	projects in compliance with deadlines and budget.
Model of assessment of financial risks of public-private partnership (PFRAM)	Analytical tool for assessing the potential financial costs and risks associated with public-private partnerships.
Diagnostic tool for assessing the tax service (TADAT)	A tool for assessing the objective condition of key components of the tax administration system.

At present, the transparency assessment reports published by the IMF cover countries that have requested an assessment. The assessment provides an opportunity to identify weaknesses in budget transparency and find capacity building points, considering the identified recommendations and the possibility of obtaining IMF technical assistance. To date, IMF transparency has been assessed in more than 30 countries with different regions and income levels.

Analysis of compliance with IMF principles provides an opportunity to monitor the state of the country's achievements in the direction of international standards, taking into account important factors in the quality of published budget information, compliance with fiscal risks, taking into account the potential of a particular country.

In addition, the IMF has developed a list of additional diagnostic tools in the fiscal sphere to assess fiscal transparency in specific areas [96].

Another international organization that deals with a wide range of areas for improving economic development policies is the OECD, whose main goal is to ensure the well-being of citizens, inclusive development and increase confidence in the state. In the field of public finance management, the organization has developed several key standards and recommendations: "Best practices for budget transparency" (2002) [95] and OECD Budget Management Recommendations (2015) [113].

One of the OECD's initiatives to improve transparency is the "Best Practices on Budget Transparency", developed in 2002 [95]. This document provides a list of recommended practices, the timely implementation of which will help increase the level of budget transparency, both in OECD countries and in other countries interested in improving the level of transparency. Different countries have their own budget reporting regimes and emphasis on budget disclosure, but the proposed practices are based on the real experience of OECD member countries.

Budget transparency in OECD practices is first and foremost a timely, systematic full disclosure of all necessary fiscal information. These practices use a tripartite approach to assessing budget transparency based on the following parts: the first – with a list of key budget reports with the recommended content; the second – a list of specific principles of financial disclosure; third – methods of ensuring the quality and integrity of reports, including the processes of internal, public and parliamentary control, accounting methods.

Among the budget documents recommended for publication, the OECD identifies the following: state budget, draft state budget, monthly reports, semi-annual report, annual report, election report, long-term budget. Within the framework of the general concept of financial transparency according to the OECD, the main characteristics of the types of transparent budget data to be disclosed in the reports have been identified.

If the key principles of transparency are observed, the national economy will gain many competitive advantages that will potentially affect the quality of the budget process, the efficiency of the use of public cats and will lead to increased socio-economic development. Let us summarize the benefits of adhering to the principles of budget transparency in line with the OECD [17].

Table 3.4 – Benefits of OECD budget transparency [95]

Advantage	Characteristic
1. Accountability	Transparency in the use of state budget funds is necessary for the growth of public control over the effectiveness of their use by public authorities.
2. Inclusiveness	Budget decisions have a wide degree of impact on the lives of different segments of the population. Transparency involves the creation of a comprehensive discussion on the implications of budget decisions by the general public, which will potentially increase the overall level of satisfaction of society's needs as a whole.
3. Honesty	Adherence to high standards of openness is an obstacle to corruption, abuse of office, waste in public finances.
4. Quality	Transparency of the budget is the key to better use of public funds due to the rapid response to changes and openness of measures.
5. Trust	The open budget process contributes to the consolidation of public opinion on the consideration and respect for the interests of society in the use of state budget funds.

In 2015, the existing "Best Practices for OECD Countries to Ensure State Budget Transparency" were refined to meet the needs of the time and "OECD Budget Management Recommendations" were developed [113]. This document includes a full list of recommendations for budgeting, management and administration based on best practices of public administration transparency. These recommendations are regulated in OECD member countries. The recommendations are based on 10 principles of good budget management, which provide an understanding of best practices in the development, implementation and improvement of budgetary tasks, based on the best practices of OECD experts and the international budget society as a whole. The general purpose of this document is to summarize the information in a systematic reference tool for public officials to improve performance for citizens in the process of planning, management and use of budget resources. Summing up the review of theoretical provisions of transparency according to the OECD, we summarize the results in Figure 3.3.

OECD transparency system
I. Principles of good budget management
1. Budgeting considering tax conditions; 2. Comparability with medium-term budget plans; 3. Observance of national interests; 4. Transparency, openness and accessibility; 5. Collectivity, inclusiveness, realism of budget discussion; 6. Comprehensive, budget accounting; 7. Efficiency of budget execution; 8. Evaluation of effectiveness; 9. Assessment of sustainability and budgetary risks; 10. Qualitative, reliable, independent audit.
II. Budget documents recommended for publication
1. The state budget, 2. Draft state budget, 3. Monthly reports, 4. Semi-annual report; 5. Annual report; 6. Election report; 7. Long-term budget.
III. Types of transparent budget data
1. Economic assumptions; 2. Tax losses; 3. Financial assets and liabilities; 4. Non-financial assets; 5. Pension liabilities; 6. Contingent liabilities.
IV. Methods of ensuring the quality and integrity of reports
1. Accounting policy; 2. Systematic and responsible; 3. Audit; 4. Public and parliamentary control.

Figure 3.3 – Theoretical foundations of OECD transparency

The generalized system of ensuring transparency according to the OECD is conditionally divided into four functional blocks. The principles of good budget management regulate the basic provisions, compliance with which potentially leads to an increase in the level of transparency of the budget system. At the budget planning stage, the principles of considering tax conditions and comparability of medium-term budget plans are relevant. Most of the principles should be followed during the budget cycle to continuously monitor the current situation, adjust and improve efficiency.

The focus on the principles of transparency, openness and accessibility must be constant.

The second functional block is a list of budget documents that reveal budget indicators in a certain area at the level of generalization. The publication of the election report and the long-term budget is situational in nature and not regulated in many countries and is therefore recommended. In addition, the national specifics, the territorial organization may make features of the disclosure of budget data.

The third functional block includes a list of types of transparent data, the disclosure of which is important in terms of ensuring the principles of a transparent budget environment. This list shows the types of data, the disclosure of which is not always included in the basic budget reporting. Because the main focus of budget reporting is on the correct reflection of sources of revenue and areas of expenditure. At the same time, as certain types of liabilities (pension, debt, contingent), basic economic assumptions, the risks of potential tax losses remain undisclosed, but in some way affect the overall state of the budget system.

The fourth block of the transparency system outlines potential methods for ensuring the transparency of budget documentation. In particular, compliance with accounting policies will make it possible to compare financial statements with each other and to reflect significant changes that justify changes in certain

indicators. Systematization, responsibility and audit provide opportunities to ensure the integrity of information for the formation of which are responsible for certain officials. Responsibility for the audit of the data presented in the reporting should be multilevel: internal, external institution of financial control and, if possible, an independent audit body. In addition, elements of public control should be present at all stages of the budget process and stimulated by public administration.

PEFA (Public Expenditure and Financial Accountability) is distinguished by significant developments in the field of budget transparency. It is a joint project to improve the evaluation of public financial management, formed in 2001 at the initiative of international partners: the European Commission, the IMF, the World Bank, the governments of France, Norway, Switzerland and the United Kingdom[151].

The main goal of the project is to provide a basis for creating a standardized methodology for evaluating the public financial management system, based on a consolidated evaluation system of 31 performance indicators, each of which is designed to measure certain aspects of the public finance system. The obtained assessments can be used to ensure a constructive dialogue on the strategy of reforming the current system of public financial management, dialogue on strategies and priorities, monitoring of existing progress.

Table 3.5 – Components of public finance management efficiency according to PEFA [110]

Component	Feature
1. Reliability of the budget	The state budget must be realistic and executed in accordance with the approved plan. This indicator is measured by the ratio of actual budget revenues and expenditures to the approved plan.
2. Transparency of public finances	Information on public financial management is complete, consistent and accessible to the public. This condition can be achieved through a comprehensive classification of the budget, transparency of revenues, expenditures and inter-budgetary transfers, publication of information on the efficiency of service provision and free access to budget and tax information.
3. Asset and liability management	The efficiency of asset and liability management ensures the optimal ratio of price and quality of public investment, identification of budget and tax risks, accounting and asset management, sound planning, approval and monitoring of debt and guarantees.
4. Basing budget policy on the national strategy	The budget strategy and budget are drawn up taking into account the priorities of national strategic plans and relevant macroeconomic and fiscal forecasts.
5. Predictability and control of budget execution	Execution of the state budget is based on a system of effective standards, processes and internal control, taking into account the proper receipt and use of budget resources.
6. Accounting and accountability	Budget accounting is accurate and reliable, the preparation and dissemination of information is timely in order to effectively fulfill the need for decision-making, management and preparation of decisions.
7. External control and audit	An independent assessment of the public finance system is carried out, and there are external mechanisms for monitoring the activities of executive bodies in the field of implementing budgetary goals to improve the results of their work.

The results include a system for assessing transparency and accountability in terms of assessing the degree of availability of budget information, reporting and auditing. Both national

economies and subnational units (regions, oblasts, cities) use mechanisms to control the effectiveness of the public financial management system. Transparent and systematized public financial management system is one of the elements that contributes to the achievement of 3 desired results of budget execution [110]:

1) ***General budget and tax discipline***: requires effective control of performance indicators of budget execution and management of budget and tax risks;

2) ***Strategic allocation of resources***: includes budget planning and execution in accordance with national and regional priorities in order to achieve the defined goals;

3) ***Efficiency of service provision:*** planned budget resources should be used with the greatest efficiency to provide the necessary services to society.

The evaluation of the public financial management system is based on the seven components of efficiency that are critical to achieving the desired results:

The considered components in some way resonate with the previously considered principles of good budget management according to the OECD, which accordingly confirms a certain stability of views on the conditions for ensuring transparency in the public sector. Let us summarize the interaction between the components of the efficiency of public financial management in accordance with the stages of the budget process, which is shown in the form of Figure 3.4.

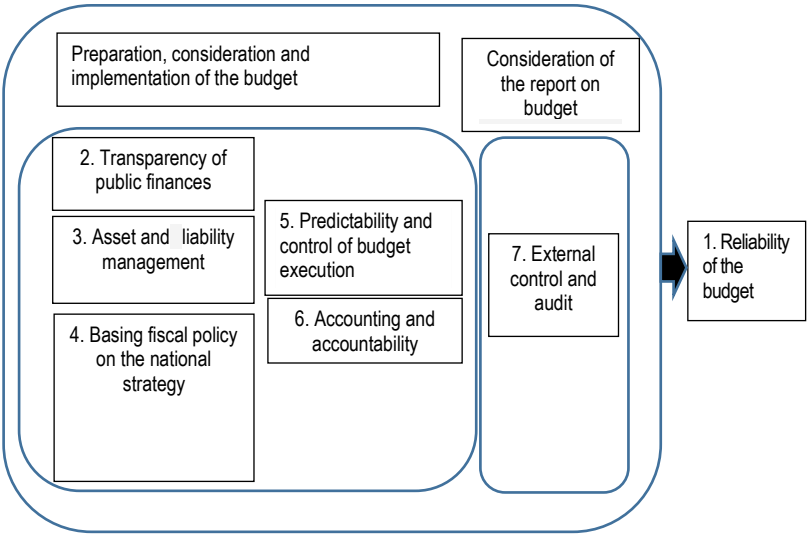


Figure 3.4 – Interaction of components of efficiency of public financial management at stages of budgetary process on PEFA [110]

Thus, in general, the methodology for assessing the public financial management system under PEFA is based on the principles of transparency, transparency and accountability for budget information. The methodology takes into account the actual performance of the budget, the existing regulatory framework, the interaction of institutions to provide comprehensive recommendations in the areas of budget control efficiency, timeliness and transparency of reporting, overall budget execution and audit recommendations.

As part of its own global mission to reduce global poverty and promote global development through financial assistance and good governance advice, the World Bank Group also strongly encourages the implementation of financial transparency principles at the global and regional levels. The importance of adhering to the basics of financial transparency is

explained by the benefits for increasing macroeconomic stability, increasing the efficiency and fairness of fiscal policy and increasing public confidence in government [96].

Through a number of domestic programs and projects, the World Bank Group develops and supports international initiatives to support countries' financial transparency reforms and improve fiscal governance. In addition to domestic programs, the World Bank Group is actively working with partner organizations to identify and engage with best international practices to further assist countries in reaping the benefits of increased transparency. One of the main institutional partners of the organization is PEFA, a detailed description of the principles of operation of this organization is discussed above. Let's summarize other initiatives of the World Bank group in the form of table 3.6.

The Global Fiscal Transparency Initiative (GIFT) was established in 2011 to improve fiscal transparency, participation and accountability in the countries concerned. Founded with the participation of the World Bank, the IMF, the International Budget Partnership (IBP) and the budget departments of Brazil and the Philippines. The main purpose of the organization is to unite joint efforts to achieve some progress in increasing the level of transparency of the fiscal sphere. The coordinated work of GIFT in the framework of increasing global transparency is directed in 4 areas: strengthening incentives, promoting global standards, technical assistance and capacity building, the use of new technologies.

Table 3.6 – World Bank Group Initiatives for Transparency and Compliance [96]

Program	Feature
BOOST (Public Expenditure Database) [23]	BOOST is a joint initiative of the World Bank launched in 2010 to facilitate access to and efficient use of budget data to improve decision-making, transparency and accountability. The program helps governments to publish and systematize budget information in a convenient form.
OpenGov Global Solutions Group (GSG) [101]	The efforts of this initiative are aimed at improving the coordination of the World Bank's efforts to form an open government, which includes transparency practices in relation to the disclosure of information, its accessibility. The initiative also researches, develops, evaluates and implements open government reforms.
Open Contracting [100]	The goal of the program is to support norms, practices and methodologies for transparent disclosure of information on budget contracts. The program focuses on improving the effectiveness of monitoring and accountability of taxpayers.
Public Expenditure Reviews (PER)	An initiative to publish reports on the structure of public expenditure in a particular area to assess the efficiency and fairness of public expenditure, to identify bottlenecks, which is an obstacle to improving efficiency.

First of all, the basic principles of budget and tax transparency have been developed, which are above the existing international standards, norms and tools for assessing transparency in order to increase coordination and develop new tools with identified weaknesses.

Visually available characteristics of the global fiscal transparency initiative are shown in the figure 3.5.

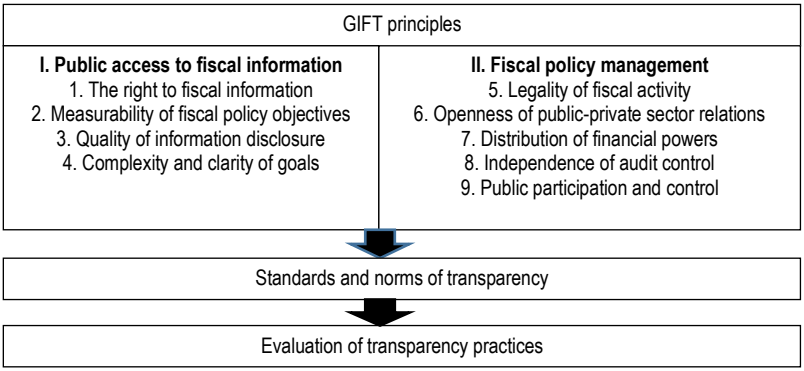


Figure 3.5 – Interaction of principles, international standards, norms and assessment tools for GIFT [134]

The theory of growth of the current level of socio-economic development is based on several basic principles of transparency, compliance with which contributes to overall growth.

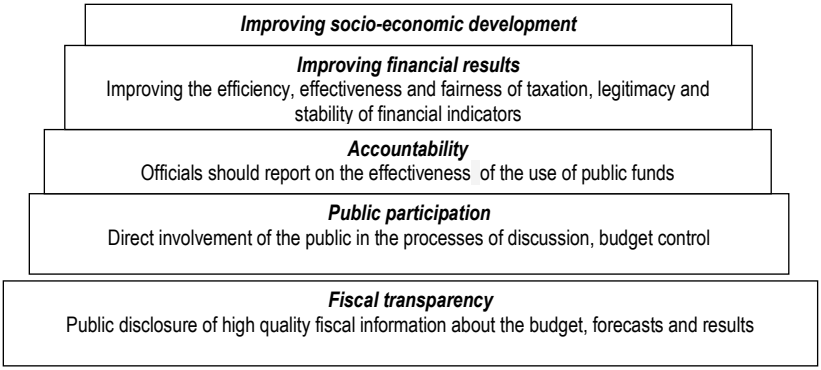


Figure 3.6 – Theory of socio-economic change based on the principles of transparency [134]

Given the theory of socio-economic change, the focus of action to achieve results should be focused on:

– promoting convergence and expanding coverage of international standards and norms in the field of fiscal transparency, including the right of access to information and public participation;

– creating a platform for the exchange of best practices in the field of transparency between governments, the public, experts, and international organizations;

– stimulating the reform of budget and tax transparency through the provision of relevant experience, practical advice and recommendations;

– use of modern technologies to increase the availability of budget and tax data, facilitate feedback mechanisms with stakeholders.

Note that the principles of fiscal transparency, participation and accountability under GIFT are universal and applicable in most countries, not considering the specifics of governance structure, organizational mechanisms, level of development and capacity. The general principles do not detail specific institutional changes, as the diversity of internal conditions requires the gradation of selected practical tools. Thus, in general,

GIFT considers the concept of transparency more broadly than the transparency of the budget system alone. This is a holistic system aimed at increasing socio-economic development as a result of adherence to the foundations of transparency. The system aims to identify problematic aspects of transparency, paying special attention to access to information on public funds and direct participation in the budget process, considering public interests, problems and priorities.

Another source of fiscal transparency assessment is the US Department of State's Fiscal Transparency Report [145], which assesses minimum transparency requirements based on US internal standards. The annual reviews are designed to assess the

potential effectiveness and transparency of the use of funds provided by the US government to support programs in recipient countries of financial support. That is, ensuring a sufficient level of transparency in this report is one of the prerequisites for the targeted use of US taxpayers' funds by governments in other countries.

Principles of transparency of budget information:

– public availability: budget reporting, including the draft budget, the adopted budget and the implementation report, should be made widely available. The draft budget must be made public at least one month before the beginning of the financial year or approved by the relevant authority. The approved budget shall be published no more than 3 months after its adoption. Report on budget execution within 12 months from the end of the financial year, respectively. Public debt information should also be made public at least once a year.

– completeness of disclosure: budget reporting should provide a complete picture of budget revenues and expenditures. The revenue part of the budget should contain a complete list of sources of formation, including revenues from state-owned enterprises. The expenditure part of the budget should include item-by-item information on the use of funds, including information on managers. Information on the receipt of financial assistance or non-financial assets from other countries should also be available. Budget documentation should include official accounts and funds formed at the expense of budget funds, and therefore should be subject to public control.

– reliability: actual indicators of state revenues and budget expenditures must correspond to the approved ones. Significant discrepancies between planned and actual data need to be further explained.

In addition, the transparency report also includes the principle of openness in terms of licensing the extraction of natural resources in terms of disclosure of information on the extracted

area of the license, the term of the license, the conditions of obtaining and the company that received the license.

The Forum of the world's 20 largest economies was initiated in 1999 to discuss key issues of global economic cooperation and good governance. One of the key tasks is to develop joint actions to make progress on infrastructure issues, open data and the fight against corruption.

Transparency is a key factor in deterring and combating corruption, so the G-20s actively promote greater transparency in budget processes, the conclusion of government contracts, the involvement of citizens in the budget process, the use of open data and joint coordination. The Anti-Corruption Working Group (ACWG) is responsible for implementing the benefits of budget transparency to support anti-corruption measures.

In 2018, the G-20 Anti-Corruption Action Plan for 2019-2021 was issued [65], aimed at fulfilling the previously committed commitments to improve the global level of transparency by strengthening the integrity and transparency of the public sector, combating financial crime related to corruption (laundering and legalization of illegally obtained funds, return of stolen assets), to continue the fight against corruption in the areas (public infrastructure, sports, etc.).

The G-20 publishes advisory tools to meet desirable standards in the fight against corruption and improve transparency. In particular, the "G20 Anti-Corruption Principles of Open Data" [66], were published in 2014, which should become the basis for access, disclosure, use of open government data and strengthening the fight against corruption. The Principles note that data openness provides a platform for expanding social participation and spreading responsibility in the areas of public procurement, policy financing, and fiscal transparency. Let's summarize the basic principles of public sector transparency and anti-corruption in the form of Figure 3.7.

Principles of transparency and anti-corruption under the G-20	
1. Basic openness	4. Involvement of citizens
2. Timeliness and comprehensiveness	5. Inclusive development and innovation
3. Availability and convenience	6. Interaction and comparability

Figure 3.7 – Basic principles of transparency and anti-corruption in the G-20

Thus, in general, the exponential growth of digital technologies opens up a significant potential for increasing the amount of open data, their quality and accessibility to create the right information environment and the necessary tools to fight corruption.

Let's try to visually summarize in Figure 3.8 the tools for assessing transparency in terms of their categorization: reviews and indices, standards and norms, initiatives.

Categories of transparency assessment tools
1. Reviews and indices - Open Budget Index; - IMF Fiscal Transparency Review (IMF ROSC); - Evaluation of the effectiveness of public financial management (PEFA); - Global Integrity Index.
2. Initiatives - Global Fiscal Transparency Initiative (GIFT); - Open government partnership (OGP).
3. Standards and norms - Code of good practice for ensuring transparency in the fiscal sphere (МВФ); - Best practices of budget transparency (OECD).

Figure 3.8 – Distribution of transparency assessment tools by category

Thus, the relationship between good governance and better socio-economic performance is confirmed by scientific work, methodological developments and empirical experience of countries that adhere to the practices of openness. Transparency

enables economies to function better and provides opportunities to be less vulnerable in crisis situations. Adequate level of budget transparency contributes to public involvement in the budget process, increases trust in government and the efficient use of budget funds. The introduction and adherence to best practices and principles of transparency at all stages of the budget process should contribute to a better degree of meeting the needs of societies, providing conditions for socio-economic development and improving methods of social reform.

3.3 Transparency of corporate finance in the system of cost-oriented business management

Transparency of corporate financial management is a guarantee and a decisive factor in the effectiveness and efficiency of the business, a condition for its sustainable growth in value in the long run. Evolutionary processes and technological development in recent decades have contributed to the emergence of such resources, which today have become dominant – knowledge and information. Without these dominants, gaining transparency in corporate finance is a difficult goal.

Bilotska I.A., Deriy Zh. and Zavgorodnya N. [18, 48] propose to understand the concept of transparency as information openness, transparency and accessibility of the environment in which the subject carries out its activities, and from whom all willing and interested persons can freely receive information that will be open, understandable and received in a timely manner and in full. Although the completeness of the information received by the business entity increases the maneuverability of the manager in making decisions, such decisions may not always be objective and beneficial to the business.

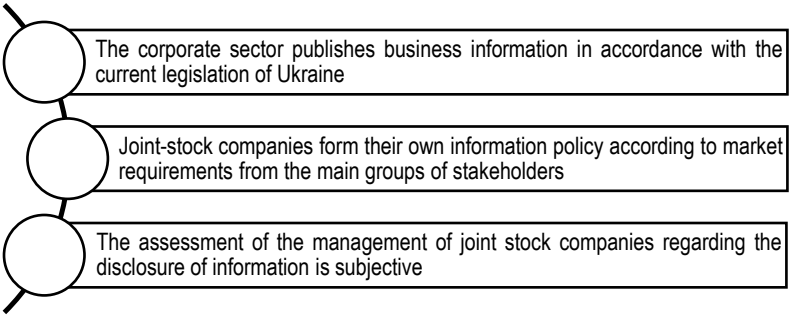
Referring to the current legislation, it should be noted that companies in the process of business activity and corporate financial management are guided by such regulations as:

→ Law of Ukraine "On Joint Stock Companies" [1];

→ Law of Ukraine "On Securities and Stock Market" [99];

→ Regulation "On disclosure of information by issuers of securities" [98].

Corporate finance is inherently a complex concept and contains many internal and external components. Corporate finance involves the management of all processes that take place in the enterprise by the management staff, on whose decisions depend on the ways of directing financial resources and sources of their involvement for business needs.



Source: [18]

Figure 3.9 – Framework for the functioning of the corporate sector in Ukraine

Modern information technologies for business process management are closely related to management approaches to doing business. Such information technologies include information analytical applications and simulation, the use of which affects the overall decision-making system, increases the transparency of management, more accurately build business forecasts, track its cash flows, increase the value of the company by increasing its financial stability and competitiveness [75].

Compliance with the transparency of corporate finance requires businesses to provide open financial information to all stakeholders. Stakeholders, and especially investors, will not be able to objectively assess the state of affairs of the company, in particular the profitability of its activities on the basis of calculated ratios, if the financial statements have unclear, opaque, and questionable content. Such an incomprehensible process of corporate process management at the enterprise creates risks for its further activity, one of the basic risks can be called undermining investor confidence in such an enterprise. [80.

Table 3.7 – Volumes of foreign direct investment in Ukraine and from Ukraine, mln. USA

Year	Foreign direct investment in Ukraine	Increase / decrease for the year	Foreign direct investment from Ukraine	Increase / decrease for the year	Balance
2005	7808	6093	275	271	7533
2006	5604	-2204	-133	-408	5737
2007	9891	4287	673	806	9218
2008	10913	1022	1010	337	9903
2009	4816	-6097	162	-848	4654
2010	6495	1679	736	574	5759
2011	7207	712	192	-544	7015
2012	8401	1194	1206	1014	7195
2013	4499	-3902	420	-786	4079
2014	410	-4089	111	-309	299
2015	-458	-868	-51	-162	-407
2016	3810	4268	16	67	3794
2017	3692	-118	8	-8	3684
2018	4455	763	-5	-13	4460
2019	5860	1405	648	653	5212
2020	-868	-6728	82	-566	-950
II quarter, 2021	2836	3704	41	-41	2795

Source: [63]

Analytical data from Table 3.7 show the unevenness and lack of a constant trend of attracting foreign direct investment to Ukraine. This was mainly due to the company's internal processes related to the low quality and non-transparency of business processes and corporate governance. The macroeconomic processes that have taken place and are still ongoing have also had no less of an impact.

During the study period, from 2005 to 2021, we can distinguish between 2008 and 2012, during which we managed to attract 10913 and 8401 million dollars to the economy. investment. On the contrary, during 2015 and 2020 they proved to be the most financially depressed in terms of investment activity, there was even an outflow of investments of $ 458 and 868 million. in accordance. This is mainly due to socio-political and economic instability due to the ongoing Russian aggression and the Covid-19 pandemic in Ukraine.

According to Mamontova N.A. [105], in the conditions of economic transformations, where the most pronounced features are institutional underdevelopment and lack of favorable conditions and opportunities for investment activity, the main marker of efficiency can still be a transparent financial management system that will promote more dynamic, compared to similar companies, the growth of business value.

According to Tsaruk V. Yu. [144], one of the ways to increase information support and transparency of corporate finance management to increase business efficiency and increase its value is additional disclosure of accounting information where the activities of corporations can be disclosed in more detail and fully. Management decisions, methodologies, models and policies are elements of corporate management and aspects that may be subject to additional disclosure of accounting information.

Additional disclosure has its advantages, which are more productive interaction with stakeholders, who find it easier to make decisions about interaction with the company. Capital markets also benefit from better risk awareness and understanding. For their part, the public and internal users of information, namely employees and management staff, will have a better understanding of the company's policy and business processes.

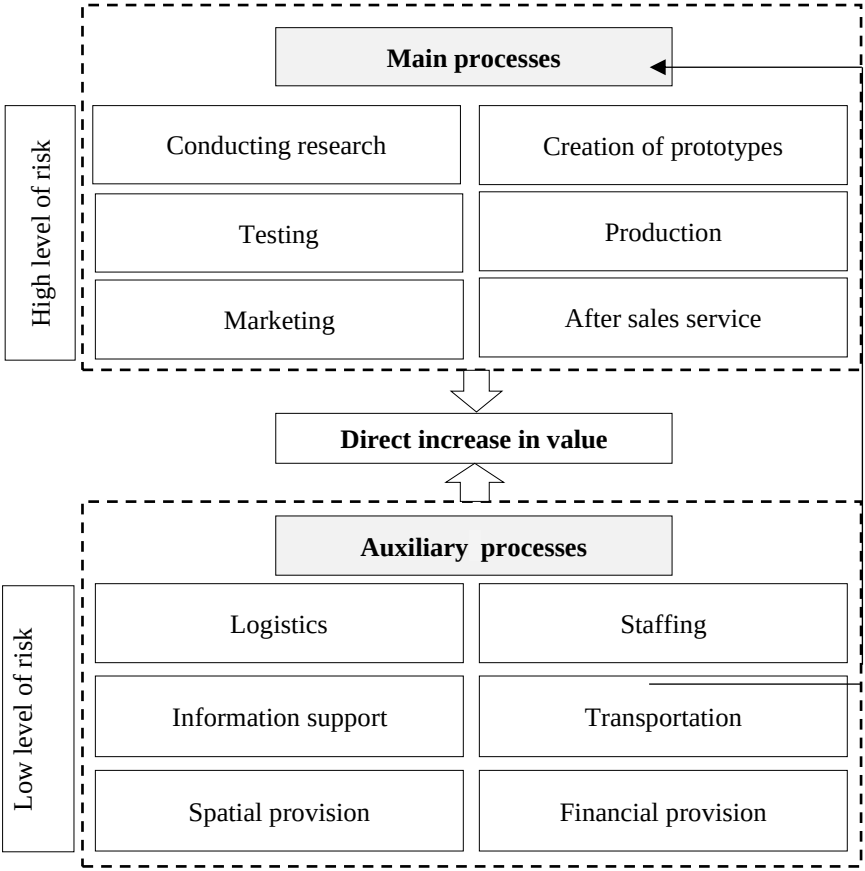
It is worth noting the existence of problems that exist in the way of additional disclosure, i.e. the need for continuous information to all stakeholders, increased procedural detail of such a process.

Conversely, if information is not disclosed sufficiently to be considered transparent, there is a likelihood of negative consequences associated with less responsible management of their responsibilities, higher cost of raising financial capital and general market inefficiency.

It is the strategic potential of the enterprise, according to Musienko V.D. [90], is necessary to increase its strategic value, and the process of evaluating the business of enterprises is the basis for developing its strategy. Among these, the researcher identifies the production potential, which manifests itself in production processes, income levels, cost of resources used and labor, it is also important to note the innovative, innovative, technical, marketing and financial potential. The actual value of the enterprise depends on the degree of efficiency of such components of its strategic potential. He identifies alternative approaches and determines which of them will provide the company with maximum efficiency and, consequently, a higher market price.

The innovativeness of the production process is also noted by Yefimova G.V. [155], who concludes that for the modern industrial or consumer market such competitive advantages are new products (goods or services). In his research, the author

notes process and allocation innovations that contribute to the improvement of product innovations through technological and methodological improvements, as well as qualitative transformation of the life cycle of all production processes at the enterprise, which will increase its market value.



Source: [155, 97]

Figure 3.10 – Basic and auxiliary processes of business value management

The release of a new product is proprietary or, if that is not possible, barriers to entry. The object of innovation can be any type of economic activity of the enterprise (operational, financial, investment) and any stage of the economic cycle. But regardless of the object of innovation, it will be carried out in four stages: research, development, implementation and use. As a result, innovation processes are key to the company's activities, increasing its corporate transparency and value [155].

In the process of value management, first of all, it should be realized that in modern conditions, a company where staff are interested in increasing their market value, there must be a transparent system of income and expenditure management, which can be interpreted as a certain financial philosophy. Stakeholders and employees must understand a philosophy that is consistent with the company's strategic plans to maximize its value and meets the established parameters of its activities.

According to Novikova I.V. [94], cost-oriented management of the enterprise is a system of functions, provisions and methods through which the subject of financial and economic activities implements its investment policy as one of the mechanisms of value growth based on sound management decisions where in the developed model of management the leading place is occupied by interests of owners of the capital.

In addition to such principles of increasing the value of business as transparency, responsibility, efficiency, continuity and others, the researcher suggests paying attention to:

→ the principle of priority of value creation, which means choosing among investment alternatives one that can ensure long-term business growth;

→ the principle of cost coordination, which is to evaluate investment decisions and their ranking based on a system of cost criteria;

→ the principle of continuity of investment decisions, which means the impact of previous investments on managerial

decisions on the preparation and implementation of business projects today [94].

As noted by Bagatska K.V. [11], in the decision-making process it is important to take into account and analyze the impact of the following key elements in the financial model of corporate governance, among such elements are:

→ the amount of expected future cash flows that will be generated by current and future assets of the company;

→ time of occurrence of these flows;

→ the level of risk inherent in the company's investment, which ensures the creation of these flows.

During the analysis of business efficiency, considerable attention should be paid to the indicators of its evaluation. To build a strategy of enterprise financial management and the quality of general management, the choice of a specific cost indicator among their existing set has a significant role and influence.

Table 3.8 – Characteristics of the main indicators of business value management

Indicator	Characteristic	Calculation formula
EVA (Economic Value Added)	It provides an assessment of the investment activity of the enterprise and shows how much its value has changed since the decision-making management. Shows how justified the risk of investing in the company was compared to alternative investment opportunities.	EVA = NOPAT –WACC *IC where: NOPAT – net operating income, after payment of income tax, but before interest; WACC – weighted average cost of capital; IC – investment capital. NOPAT = EBIT x (1 – T), where: EBIT – income before interest and taxes; T – income tax rate.
MVA (Market	It is a continuation of the model of economic value	MVA = MVD + MC – TC

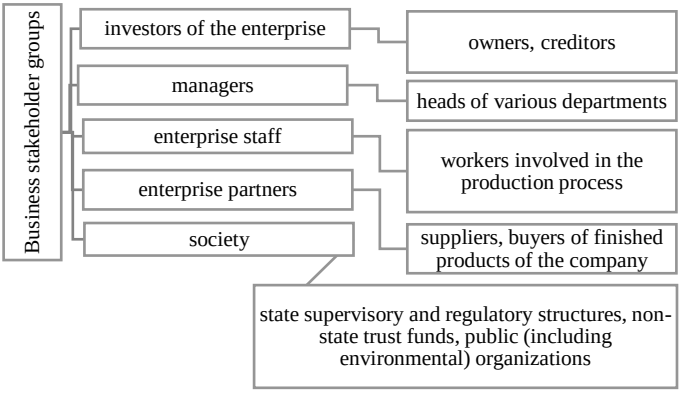
Value Added)	added. Is the relationship between the market value of equity and debt capital and investment. Shows the benefits that a company can get from the market, in addition to using the investment.	where: MVD – market value of debt; MC – market capitalization; TC – total amount of capital.
SVA (Shareholder Value Added)	Ensuring shareholders' claims in the growth of business value by increasing the value of their securities and financial benefits in the form of dividends.	SV = SVf – SVb, where: SVf – estimated value of share capital; SVb – book value of share capital.
CVA (Cash Value Added)	Calculation of generated cash flows as a return on investment, considering the variability of the value of money over time.	CVAj = CBIj – NA0 x WACC, where: CVAj – net cash flow to interest payments; Nao – net assets at cost. CBIj = EBIj + Depj – Edj where: CBIj – net cash flow to interest payments; EBIj - net operating profit; Depj - accounting depreciation; Edj - economic depreciation.

Source: [78, 44, 109]

Having a large number of stakeholders in the business implies that each of them has different goals in business and has their own interests. This is the cause of corporate conflicts, which are studied by scientists as a separate component of corporate finance in the enterprise. The most prominent stakeholders between whom potential conflicts may arise are hired managers who are interested in making a large profit from the implementation of a business project, which in the future may not have financial benefits and be unprofitable. Shareholders, on the other hand, are interested in the stability and growth of the

value of their business in the long run, even if profits are not too high now.

Davydov I.O. [44], explains the importance of business value as an abstraction, which materializes under the influence of socio-economic processes in a particular enterprise operating in a market environment. Summarizing the analyzed literature, we highlight the following groups of stakeholders of the enterprise, which are presented in Figure 3.11.



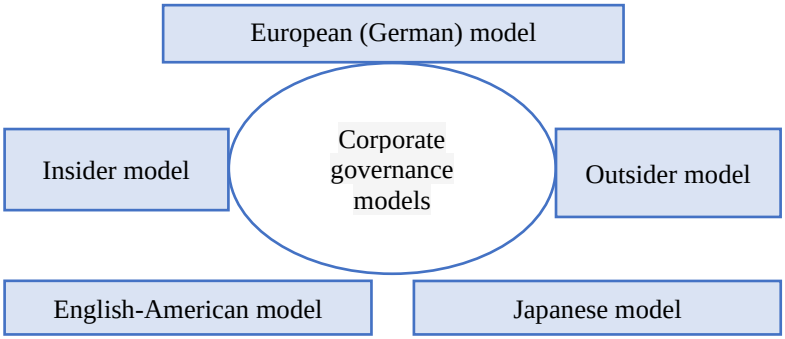
Source: [44]

Figure 3.11 – Business stakeholder groups

Among those interested in the transparency of corporate finance, according to the author [44], it is first necessary to focus on capital owners who are interested in long-term operation, value growth, increasing the competitiveness of business.

If management considered, it expects to maintain remuneration and professional growth. In turn, employees expect that the company will work for the future and expect to save jobs and wages by expanding production. The interest of creditors and borrowers in the enterprise is to issue new loans and timely and full repayment of existing ones. The society

hopes that the business will comply with the legislation on environmental protection, compliance with environmental standards, will behave in good faith in the payment of taxes and fees to the budget.



Source: [75]

Figure 3.12 – The most common models of corporate governance of business processes

In addition to the already mentioned analytical applications and simulation, corporate finance of business structures involves the use of accounting and management software products that plan the necessary resources for production, automated and reliable programs for storing and processing information, namely object systems for working with databases. It is also worth mentioning software that focuses on interaction with customers, they increase the effectiveness of marketing and sales.

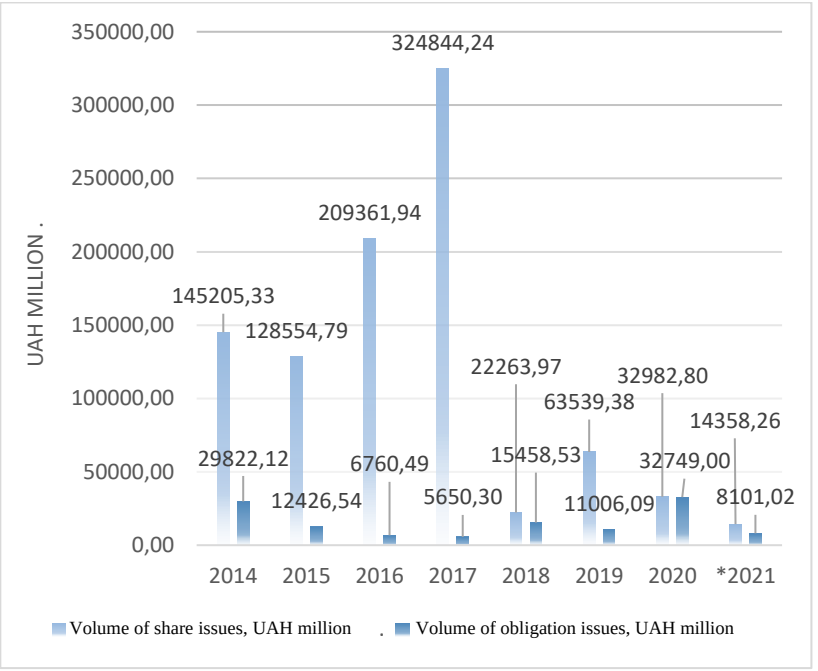
DocFlow and WorkFlow are equally important for improving the transparency of corporate finance, which allow you to manage workflows and document management more effectively. [75].

The main areas of company management that help maximize its value include profit management, cash flow, capital and

investment. Profit management is to ensure its quality by maintaining an optimal balance between the amount of profit and compliance with acceptable risk. Cash flow management, namely the transparency of financial flows, the provision of capital for operating, investment and financial needs, reducing the period of their turnover and cost optimization. Capital management provides opportunities for its timely reinvestment and maximum profitability [47].

Managing the value of a business and increasing its value have certain difficulties in combining these categories. As you know, one of the reasons for the growth of business value is to improve its market position and gain a competitive advantage. In addition to meeting the needs of owners in the form of dividends and capitalization, the priorities of buyers of products, namely the emphasis on innovative ways to meet their needs, should play an important role in the system of relations between participants in economic processes. Given this, consumers are entities that form the value of the company because in the process of purchasing products they have an understanding of the excess of benefits over costs [44, 102].

As we can see in Figure 3.12, the analysis of the securities market is represented by the dynamics of the issue of shares and bonds of Ukrainian companies. The volume of share issues for the entire study period during 2014 – Q2 In 2021 it significantly exceeded the bond issue. The maximum gap between the analyzed indicators is observed for 2017 and amounts to UAH 319193.94 million, while the volume of bonds issued amounted to UAH 324844.24 million. From 2018 to the middle of 2021, the difference between the issue of these indicators decreased significantly and at the end of the analyzed period (Q2 2021) the volume of shares was 14358.26 million UAH, and the volume of bonds – 8101.02 million UAH.



Source: [92]
* - Data as of the second quarter of 2021

Figure 3.13 – Total value of issues of equity and debt securities by Ukrainian companies during 2014-2021

Studies of the features of corporate finance in the business value management system have allowed scientists [19], to identify some management approaches, namely the functional approach, which emphasizes the importance of financial management in the operational management system, asset financing to achieve the overall goal. A systematic approach, according to which financial decisions are based on established principles and methods of business management. This approach, in contrast to the functional, involves more detail of the object of management, consideration of additional issues related to

strategic value growth. Process approach, in which the main role is played by the financial mechanism, using appropriate methods and levers of decision-making.

Achieving the required level of transparency of corporate finance in the system of cost-oriented business management requires all those involved inside and outside, in addition to following the principles and norms of operation, a responsible attitude to their responsibilities in the process of acquiring high professional skills and mutual economic development [19].

3.4 Transparency of securities transactions as a prerequisite for the effective functioning of the stock market

Securities are the main instrument of the stock market. They are a document of strict reporting, showing the property rights of its owner. Any transactions with securities can be carried out only in its presence or confirmation of ownership.

Thus, under operations with securities it is accepted to understand actions by means or with securities in the stock market for achievement of the set purposes. «… Depending on these purposes, all transactions in the securities market can be divided into 3 major groups:

1) Issuance operations – i.e. operations carried out in order to provide financial resources for the economic entity, for example in the formation or increase of equity, as well as borrowing;

2) Investment operations. Their purpose is to invest their own and / or borrowed funds in stock assets on their own behalf. In this case, according to the tax code, the profit received by legal entities from investment transactions with securities is subject to income tax;

3) Customer transactions. Their purpose is to secure the obligations of professional participants in the securities market

to clients in respect of securities or client obligations related to securities [93]».

A review of the modern scientific literature shows a significant interest in various aspects of securities transactions and the financial and economic mechanism for managing this process.

A significant number of scholars dedicate their work to the study of the system of accounting and auditing of securities transactions. Among them are the works of O. Melen, N. Poberezhna, L. Strygul [87]. T. Poleva and I. Porsyurova who consider the audit of securities transactions [107].

The turnover of securities allows you to solve many problems within the national financial market. It helps to concentrate, centralize, and accumulate capital, supporting the needs of the market and individual actors.

The turnover of stock instruments performs the following functions:

1. Attracting external sources of funding for commercial needs. Production needs are covered by internal reserves, but not completely. The required amounts are obtained through loan capital, as well as investing in securities.

2. It allows you to get extra income with free cash. The market of stock instruments becomes attractive for investors if it has profitability properties, an adequate level of taxation, as well as the degree of riskiness of the market and its operations, the level of professional service is analyzed.

Stock markets are classified on various grounds. For example, the primary market serves paper that has just been released and is sold for the first time. Already issued papers are valid on the secondary. There is a constant transfer of ownership from one entity to another. Stock markets can be regulated or unregulated. The first are organized systems, which involve professional participants who have passed the licensing procedure. Here the level of insurance is higher, however, and

the requirements for new participants are quite high. In unorganized markets, any entities can operate, but all interaction is purely on a contractual basis.

Stock markets support securities transactions through the operation of the stock exchange. OTC markets use various informal platforms for financial activities. Markets can be public or traditional, as well as computerized. The latter have become widespread due to the development of the Internet and increasing the level of information security.

Many publications in this area are devoted to the operations of commercial banks with securities. Today, banks are key players in the stock market and participants in investment processes in the field of financial investment.

Theoretical and methodological principles of securities transactions are also given in the works of scientists of Sumy State University [38, 141, 86, 114, 38].

Analyzing the interest of modern scientists in the management of securities, we will use the software product Google Trends. It allows you to analyze the frequency of information searches for the use of certain terms and categories. Such search terms should include various types of securities, such as stocks, bonds, checks, promissory notes (Fig. 3.14).

As shown in Figure 3.13, more attention is paid to finding information on the management of trading operations related to stock trading. This is not surprising, because stocks are one of the main instruments used by investors in financial markets. With regard to other financial instruments, it can be concluded that transactions with bonds and bank checks are also popular.

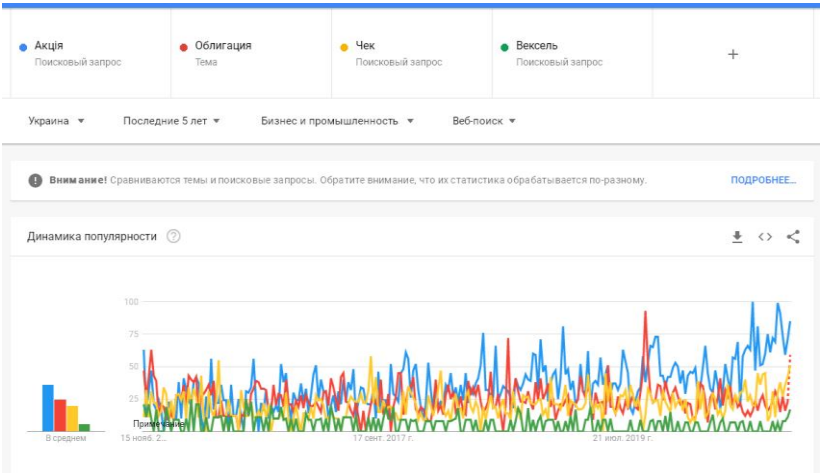


Figure 3.14 – Frequency of use of terms related to securities in Ukraine [author's development].

Analysis of the current state of the securities market of Ukraine revealed a group of problems in the functioning of the securities market. Some of them can be defined as follows:

- a significant number of issued shares remain out of exchange turnover.
- insufficient activity of private domestic investors in the securities market.
- lack of an effective procedure for bankruptcy of enterprises, when joint-stock companies have little interest in maintaining efficient operations and profitability.
- insignificant level of transparency of some joint-stock companies, underdeveloped corporate governance system.
- modest share of participation of institutional investors in the securities market, especially insurance companies.
- lack of experience and skills of the population to work with investment instruments, including securities.

- problematic access of small investors to the securities market, including through the institution of collective investment.

- conditional liquidity of certain groups of securities.

- lack of special platforms for small innovative enterprises.

- the situation that some joint-stock companies have a practice of ignoring payments on shares, which does not contribute to attracting to the securities market portfolio investors interested in obtaining stable expected returns.

One of the reasons for the decline in activity in the secondary market is the shortage of supply in the secondary market of shares of large, financially stable companies with higher liquidity and investment attractiveness. To date, the investment opportunities that the stock market potentially provides to domestic corporations are underutilized. At the same time, today there are favorable conditions for changing the situation for the better.

Today it is necessary to intensify the inflow of investors' funds into the financial market. Such an increase is possible, inter alia, due to an increase in the share of savings in the structure of savings of the population, which are directed to securities; increasing the share of direct and portfolio investments in the structure of foreign investments. Such measures may include a number of areas to stimulate investment in securities, including active tax incentives, the creation of compensation mechanisms, etc. A prerequisite for the stable development of the national financial system is its balance. To determine the possible parameters of the balance of the financial sector, as well as the factors of its achievement in the forecast period is possible on the basis of the use of forecast balance sheets of sectors and financial instruments.

Securities can be managed only by securities traders. But this only applies to equity securities. As you know, in today's market there are also non-equity securities that can belong to any

business entity. Issuance of non-issue securities does not require strict control by the state, so it can be issued without registration. The very concept of "securities management" includes not only the functions of securities management, but also financial contracts, cash, which are invested in financial instruments.

Securities management is a risky activity. The peculiarity of this type is that the installer has great confidence in the manager. This is characterized by the fact that the manager carries out the entire process of transfer of securities, their investment, and considers the strategy of increasing the value of securities. That is why the installer must listen to all the advice of the manager and clearly follow his instructions. In turn, the manager has no right to argue or fail to perform his duties specified in the contract. Most securities transactions are conducted on the over-the-counter market, which means that there is almost no corporate securities market. Consequently, paper management is not functioning well enough, as the over-the-counter market is not for profit. Also, it shows that most companies cannot trade on the stock exchange, due to low performance, which does not meet the conditions of registration on the stock exchange. The capitalization of Ukrainian companies does not reach even 2 billion dollars, when US joint-stock companies have a capitalization of about 20 trillion. dollars. This means that Ukraine cannot establish proper management and regulation of securities, which would increase the operations on the stock market and make a profit from them.

Thus, the peculiarities of securities management in Ukraine are that they can be traded only by an authorized person – a securities trader. Securities management is a risky activity, and a relationship of trust must be established between the founder and the manager. Securities management agreements are regulated by the Law of Ukraine. Securities management is a rather unorganized system, as in Ukraine, compared to other countries, the capitalization of companies is quite low, and most

transactions take place on the over-the-counter market. The number of traders who manage securities decreases every year, and the quality of management decreases accordingly [81].

Investment activities and operations with securities of commercial banks are significant. Investment operations of banks are mainly limited to operations with securities, which can relate both to the intermediary activities of banks and conducted on a commission basis, and to banking operations conducted at their own expense. The bank's work with securities is built in two directions: the bank invests funds (its own and on behalf of the client), as well as issues its own securities – stocks, bonds, certificates of deposit. Banks can buy company shares and often do so to manage them to maximize the value of the shares. In such cases, a controlling stake is purchased.

The issuance of these securities allows commercial banks to:

- increase the size of own investments through the issue of shares;
- to form a credit package by issuing bonds;
- attract deposits during the issuance and sale of certificates of deposit and savings;
- to raise funds and increase the clientele through the issuance of promissory notes.

Modern investors buy securities either to earn extra income or to be able to manage a bank. The main risk in the issue of shares is the risk of non-placement of securities of commercial banks, but this risk is very small. The procedure for issuing shares for commercial banks is quite a time-consuming process, so banks place additional bonds, as well as various money market instruments - placement on deposits, debt obligations. The issue of securities in the form of shares and bonds changes the bank's equity and debt, and the issue of certificates and promissory notes is considered as attracting deposits or irrevocable deposits. When issuing bonds, commercial banks have many advantages:

- the issue of bonds avoids such a requirement as mandatory reserves, as the fund of required reserves has no deductions from them;

- the procedure for issuing bonds is simpler than issuing shares, because you do not need to open a special savings account;

- commercial banks do not need to set the minimum paid share of the bond issue in relation to the initially declared amount, the achievement of which is necessary for the registration of the results of the issue;

- interest paid on bonds reduces the tax base, it reduces taxable income.

The securities market is currently a complex system of relations that requires specific knowledge, skills and experience of all participants, who, as a rule, do not have the appropriate amount. Thus, the involvement of intermediaries for the functioning of this segment of the financial market becomes necessary. This means that it is also subject to the characteristics of the securities market as a mechanism for redistribution of capital between market participants (issuers and investors) through intermediaries. Given the variety of market instruments, as well as the availability of not only the primary but also the secondary market, the coincidence is not the result of chance, but rather a consequence of the provision of specialized services by intermediaries in the securities market.

An organized and well-functioning securities market in the country means many advantages, both for individual entities and for the economy as a whole. To determine the peculiarities of the institutional features of the securities market, to characterize the nature and necessity of intermediaries in it, it is necessary to determine the basis of analysis of existing interpretations of the main characteristics of the securities market and its segments related to the maturity of securities. From the point of view of the interests of securities market participants, the most important factor is the term of investment attraction, as the time factor in

any segment of the financial market is crucial for the formation of risk and consequently is important for offering the appropriate level of profitability.

In the regional securities market, when including individual investors in the market, the size and structure of excess savings is of great importance, which means that private and corporate investors have sufficient funds, which are kept in a relatively liquid form. The most suitable instruments in this case are currency, bank deposits and deposits (including unallocated metal accounts), as well as securities traded on an organized market. When returning funds from investing in these financial assets may be a partial loss of their value, but in general the investor has the opportunity to return the money faster and easier than when selling real estate or shares in a limited liability company or illiquid securities of regional issuers.

It contributes to the development of the financial services market. Financial institutions compete with each other both for one service (for example, competition in the brokerage services market) and for mediation of financial resources as a whole (competition in which investors are offered different investment options depending on the specifics of the financial institution: bank deposits and deposits, unallocated metal accounts, general funds of banking management, brokerage services, dealer services, trust management of securities, agency services for the purchase and sale of investment units). Thus, in the financial market of the region begins the struggle for free funds of the population and enterprises; in this case, the specific form of attraction and mediation of these funds may be limited only to the activities permitted for financial institutions. The function of concentration of investment capital becomes a key regional function of the securities market.

Current trends in the financial markets of different countries indicate the following: if previously the markets were dominated by professional investors, recently the market including the

securities market are actively entering individual investors. Among the positive features of this group are the freedom to choose the object of investment, mobility, the availability of free financial resources for a certain amount of time. The negative features are the huge dependence on public opinion, rather low investment opportunities, the desire and attempt to achieve mandatory investment guarantees.

Due to the fact that the financial market belongs to emerging markets, domestic individual investors especially in the regions do not yet widely use the general principles of financial investment management, taking into account the Western experience, which must be relied on today. Therefore, there is a need to focus our attention on some issues of investment portfolio formation in the regional securities market. We will consider the investment goals that an individual investor sets for himself when investing in financial instruments.

Most of the rules that affect the status of the right of investors who act as participants in the securities market do not have sufficient wording. Thus, the rules do not consider the specific features of this type of activity, and therefore at some points are not used successfully enough.

Summing up the analyzed information, we can draw the following conclusions about the role of RZB in the structure of the financial market. First, today the banking sector occupies a leading position compared to the stock market as capital increases. It is easier for individuals to open a bank deposit than to conduct operations in the securities market. Therefore, the share of operations and income of commercial banks is much higher than the share of income of professional intermediaries. Second, as noted earlier, the number of professional RZB participants is declining and the share of their clients is growing. This is largely due to the tightening of requirements for the regulation of the NBU stock market and competition in the

market. Due to this, a large number of professional participants resort to the integration and consolidation of capital.

The main risks to the development of professional participants include a high degree of public distrust in financial instruments and the securities market in general, in contrast to the banking sector, which mainly offers deposits at low interest rates and the instability of RZB itself, despite ongoing efforts to strengthen it. and development. Third, macroeconomic factors create a situation where private investors prefer to give relatively little money for speculative transactions. Therefore, recently the volume of turnover on customer accounts is not increasing, despite the fact that the number of investors themselves is growing.

Some authors consider current trends in the securities market in view of the digital transformation of the economy. The process of digital transformation of the securities market will promote economic growth in the country by overcoming structural imbalances in the economy. This process will promote the openness and transparency of the securities market, as well as the emergence of reliable issuers and large investors. The era of digitalization significantly transforms the accounting, subject, instrumental and settlement and clearing structures of the securities market. The Ukrainian stock market can be described as quite receptive to new technologies. Thus, the emergence of new Internet technologies abroad began in 1994-1995. Ukrainian companies began to offer their services via the Internet much later, but despite this they became an integral part of the Ukrainian stock market. The Ukrainian market is dominated by speculative transactions, with a small share of long-term investments. For speculative transactions it is important to quickly assess the information, its continuous monitoring, rapid operations and calculations and it is Internet trading that meets all these conditions.

The term "Internet trading" (English Internet - trading, similar names "E-trading" or "I-trading") refers to the method of trading operations related to the purchase or trade of shares and other types of financial instruments in the international financial market, through the services of dealing centers and specialized programs online.

There are 2 types in the Ukrainian Internet trading system:

1. "Mediator" (on-line broker). The broker accesses the trading systems via the Internet, which speeds up and simplifies the whole process, while the broker's client gives orders online.

2. "Independent", direct access (direct access). This is a more promising way for investors to manage their free funds by investing them in securities through an online trading system. The peculiarity of this type is that the investor already plays on the exchange online with a special program. In addition to making a quick deal at the current price, the client also has another option to withdraw the deal. Internet trading is the relationship of 3 components: trading system, Internet trading users and software. Internet trading is a modern way to place free cash by buying or selling securities in real time. The main difference from the real trading on the stock exchange is that the client is provided with a minimum (small) set of services of the broker (acceptance and execution of the application, everything else is additional).

Several hundred online brokers have already received recognition around the world. They can be both newly established companies and divisions of large investment banks, mutual funds, and others. Software is the most important equivalent of the existence of this online trading system. Convenient and clear interface of the program allows you to see quotes online, all transactions that take place in the trading system, which change dynamically, as well as all the information about the limits after each transaction. All useful information, indicators of dynamics, graphs, etc. can be stored in the archives

of these programs for analysis of transactions. Information support and execution time of the application is what the trader pays attention to constantly in the course of his activity. The speed and efficiency of the trader's work depend on the ease of use and capabilities inherent in the software. Accordingly, in the Internet trading system can be divided into three components:

1. The system of delivery of exchange information is that each bidder receives the same information as the broker.
2. The system of delivery of client's orders facilitates direct and more accelerated transfer of the order to the exchange trading system.
3. Tracking systems for the transfer of the application to the exchange system – view the status of the application in real time, it is also possible to cancel the application.

Internet trading has a huge number of advantages, among which the following deserve special attention:

1. The ability to achieve financial independence.
2. The minimum amount of tax fees. Tax fees are deducted when making a profit.
3. Free schedule and freedom of movement. Anytime, anywhere.
4. Choosing tools for the optimal set.
5. Availability of free training programs.

In addition to the advantages, there are weaknesses, among which are the following:

1. The need for a significant amount of free funds. For online trading to bring significant income, you need a capital of $ 1,000.
2. Long learning process.
3. Availability of knowledge and skills.
4. Lack of stable earnings.
5. Development of marginal trade (there may be a situation of excitement in the market).

6. Serious psychological stress. Due to the high probability of damage, the player is in strong emotional stress, which causes significant damage to his overall health.

It can be concluded that currently the online trading system is available to every interested person, which is enough to register with the selected broker and start trading. This factor is the reason for the popularity of trading among people from around the world interested in additional income

CONCLUSIONS

The development of technology has served as a driver of macroeconomic transformation. A key factor in the development of the financial system has been the introduction of new financial technologies that emerge as a result of conservative financial management in the use of digital technologies. In recent years, the financial technology industry is developing rapidly. Technological advances are changing our daily lives. Innovations such as IoT (Internet of Things), AI (artificial intelligence), blockchain and cloud storage are the main drivers of fintech companies.

Greater access to information through analytics, artificial intelligence and cloud computing allows companies to see trends faster and adapt to them.

Fintech (financial technologies) is a line of business that uses new technologies and innovations in the financial services market.

Today, fintech is often seen as a unique segment of financial services and information technology, and there are several interpretations:

– a new sector of the economy, consisting of young companies that provide improved products and services in the financial market;

– a set of companies of the newest technologies which on the basis of own means develop mechanisms of introduction of innovative technologies in a traditional financial sector of economy;

– use of software to meet the demand for financial market products.

Fintech has many obvious advantages over traditional financial services, which can be considered opportunities for its rapid development: speed and convenience; a wide range of

services; more favorable conditions for services; more personalized products. And eliminating some of its risks will only strengthen its position in the market.

With large amounts of data, artificial intelligence, blockchain, and many other technological advances already in use or on the horizon, business leaders are encouraged to look for opportunities and use fintech applications in their own business models to win over tomorrow's consumers.

The potential of digital technologies opens up significant potential for building the right level of financial transparency, enabling economies to function better and be less vulnerable in crisis situations. Thus, a sufficient level of budget transparency contributes to public involvement in the budget process and increases trust in government and the efficient use of budget funds. Transparency of corporate financial management is a guarantee and a decisive factor in the effectiveness and efficiency of the business, a condition for its sustainable growth in value in the long run.

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Fintech innovations and transparency of finance: world practices and Ukrainian realities

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