DIGITAL FINANCING INSTRUMENTS FOR THE ECONOMY IN WARTIME AS A GUARANTEE OF FINANCIAL SECURITY

ЦИФРОВІ ІНСТРУМЕНТИ ФІНАНСУВАННЯ ЕКОНОМІКИ В УМОВАХ ВІЙНИ, ЯК ЗАПОРУКА ФІНАНСОВОЇ БЕЗПЕКИ

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The study highlights the importance of ensuring Ukraine's financial security during wartime, when digital tools are vital for resource mobilization, transparency, and financial infrastructure transformation. It analyzes the role of digital financial instruments in Ukraine's wartime economy, identifying their strengths, weaknesses, opportunities, and threats. Using a comprehensive methodology – including terminological analysis, comparative approaches, Ukrainian experience, and SWOT analysis – the study shows how tools like UNITED24 and fintech solutions supported financial access and transparency. Despite lacking a unified definition, these instruments span technological, financial, legal, and institutional aspects. Key benefits (speed, flexibility), risks (cyberthreats, volatility), and policy recommendations (cybersecurity, financial literacy, public platforms) are outlined. Digitalization is essential for stabilizing and modernizing Ukraine's financial system.

Keywords: digital financial instrument, wartime economy, digital technologies, financing, electronic bonds, cryptocurrency, online banking.

Актуальність теми дослідження зумовлена необхідністю забезпечення фінансової безпеки України в умовах воєнного випробування, коли цифрові інструменти відіграють ключову роль у мобілізації ресурсів, підвищенні прозорості використання коштів і трансформації фінансової інфраструктури. Мета дослідження полягає в аналізі ролі цифрових фінансових інструментів в економіці України під час війни, визначенні їхніх переваг, недоліків, можливостей і викликів. У статті використано комплексний методологічний підхід, зокрема термінологічний аналіз, порівняння різних наукових підходів, аналіз українського досвіду, а також SWOT-аналіз. У статті проаналізовано роль цифрових фінансових інструментів у підтримці економіки України в умовах війни. Встановлено, що, попри відсутність усталеного визначення терміна, цифрові фінансові інструменти охоплюють технологічний, фінансовий, правовий та інституційний аспекти. Визначено їх ключові типи, такі як краудфандинг, криптовалюти, смарт-контракти, електронні облігації, цифрові платіжні сервіси. Доведено, що завдяки платформі UNITED24, використанню криптовалют, цифрових облігацій та фінтех-сервісів, Україна встигла адаптувати свою фінансову систему до умов війни, зберігаючи доступ громадян до коштів, спрощуючи отримання пожертв та підвищуючи прозорість. Було окреслено головні переваги (швидкість, гнучкість, зниження витрат), недоліки (кіберризики, недостатня регуляція, волатильність криптоактивів) і також загрози (інформаційні атаки, відтік капіталу). У дослідженні запропоновано заходи щодо використання цифрового потенціалу, зокрема посилення кіберзахисту, розвиток фінансової грамотності, створення державних прозорих платформ, розвиток міжнародного партнерства. Областю подальшого застосування результатів є державне фінансове управління, банківський сектор, волонтерські й громадські ініціативи. Зроблено висновок, що діджитал-технології є необхідною умовою стабілізації та інноваційного оновлення фінансової екосистеми України. Ключові слова: цифровий фінансовий інструмент, військова економіка, цифрові технології, фінансування, електронні облігації, криптовалюта, онлайн-банкінг.

Formulation of the problem. In the context of ongoing military aggression against Ukraine, the issue of financial security has become critically important. The national economy is experiencing significant losses, manifested in the destruction of production capacities, disruption of supply chains, and a marked decline in investment activity. At the same time, modern digital technologies provide opportunities to sustain and revitalize economic activity under extremely adverse conditions. Digital financial instruments-such as electronic payment systems, crowdfunding platforms, digital currencies, and blockchain technologies-are playing an increasingly vital role in mobilizing resources, supporting businesses, and securing funds for defense and post-war recovery needs. Consequently, the search for effective financial instruments has become a matter of strategic importance for the survival of both the economy and the state as a whole.

Analysis of recent research and publications. The nature and classification of digital financial

technologies have been comprehensively examined in the works of Havva V.V., Haponiuk M. [1], and Hrytsai S.O. [2], among others. The practical application of digital financial assets and technologies has been addressed in the research of Marmul L.O., Chornyi B.S., and Penkovskyi V.S. [4], as well as Chunitska I.I. and Bohrinovtseva L.M. [3], who highlight their transformative potential for enhancing the resilience of financial systems. These scholars propose systematic approaches to the modernization of financial infrastructure through digital innovation. Additionally, theoretical and practical issues related to the regulation of digital financial assets in Ukraine and globally are discussed in the studies of Havva V. [1], Sytnyk N.S., and Feliseyeva V.A. [6], which contribute to the institutional development of state financial policy.

Previously unresolved parts of the general problem. Despite significant advancements in the implementation of digital technologies within the financial sector, a range of challenges remains unresolved. These include the lack of a unified definition of the term "digital financial instrument," assessment of the benefits and risks associated with its use in wartime conditions, issues of cybersecurity, the effectiveness of state regulation, the need for alignment of domestic legislation with international standards, and the promotion of active participation by businesses and the public in digital financial platforms aimed at supporting critical economic sectors.

The purpose of the article is to investigate the role of digital financial instruments in sustaining the national economy under wartime conditions, to identify their key advantages and limitations, and to explore opportunities for their application in enhancing Ukraine's financial security.

Presentation of the main material of the study. However, there remains no universally accepted

definition of the term "digital financial instrument" within the academic discourse. Contemporary economic literature employs a range of closely related terms, including "digital financial assets", "digital financial technologies", "digital finance", and "digital technologies in the financial market". This diversity reflects the varying conceptual approaches adopted by scholars, practitioners, and international organizations toward understanding this evolving phenomenon (see Table 1).

The analysis of definitions presented in Table 1 enables the identification of key conceptual approaches to understanding the term "digital financial instrument", which are synthesized and summarized in Table 2.

OECD [7], Hrytsai S.O. [2], and Chunitska I.I. [3] emphasize the technological component, particularly

Table 1

Terminological Analysis of the Concept of "Digital Financial Instruments"

Definition **Author** Digital financial assets are a form of financial assets created using distributed ledger technology Havva V., or similar digital solutions. They exist exclusively in electronic format and may take the form of Haponiuk M. [1] monetary funds, equity instruments, or contractual rights. However, they do not include digital equivalents of fiat currencies, traditional securities, or other classic financial instruments. Digital financial technologies are innovative tools that combine financial, legal, and technological aspects. In financial and economic terms, they are digital assets that are not legal tender but can serve functions of exchange, settlement, value storage, and be used for payments Hrytsai S.O. [2] and investments, particularly in a cross-border context. From a legal perspective, they are intangible objects that may acquire legal status (e.g., "digital goods") and certify property rights. Technologically, they rely on cryptographic algorithms and mostly use decentralized ledgers based on blockchain technology, requiring appropriate digital infrastructure. Digital technologies in the financial market are tools that include neobanking, blockchain, Chunitska I.I., financial ecosystems, cryptocurrencies, and artificial intelligence, all of which contribute to the Bohrinovtseva L.M. [3] development of Ukraine's financial market. Digital financial instruments are any contracts that can be transformed into financial assets; Marmul L., Chornyi B., electronic money; financial market products; and documents of financial relationships in the Penkovskyi V. [4] online sphere. Kazakova N.A., Innovative financing instruments are alternative funding sources such as crowdfunding and P2P Stepanenko V.D. [5] lending, used to financially support small and medium-sized enterprises. Digital finance is an innovative approach to improving the financial services sector that Sytnyk N.S., involves the use of digital technologies to reduce information asymmetry and expand access to Feliseyev V.A. [6] OECD (Organisation Digital financial instruments are technology-driven financial solutions, including digital payment for Economic Co-operation systems, crowdfunding, peer-to-peer lending, and blockchain-based financial mechanisms. and Development) [7] Digital finance is defined as financial services and instruments that use or are based on new European Parliament [8] information and communication technologies (ICT).

Source: systematized by the authors

Table 2
Approaches to Defining the Concept of "Digital Financial Instrument"

Approach	Advantages	Author(s)	
Technological	Highlights the fundamental mechanisms of digital instruments. Important for IT specialists, startups, and investors.	Havva V. [1]; Hrytsai S.O. [2]; OECD [7]	
Financial	Reflects practical value for businesses, investors, and government support programs.	Marmul L., Chornyi B., Penkovskyi V. [4]; Sytnyk N.S., Feliseyev V.A. [6]; Kazakova N.A., Stepanenko V.D. [5]	
Legal	Helps in developing a regulatory framework for digital assets.	Hrytsai S.O. [2]; European Parliament [8]	
Institutional / International	Promotes unification of approaches, and development of policies and regulations on a global scale.	OECD [7]; European Parliament [8]	

Source: systematized by the authors

blockchain, artificial intelligence, and digital ledgers. At the same time, Havva V. [1] identifies distributed ledger technology as the foundation for the existence of digital assets.

Kazakova N.A. and Stepanenko V.D. [5], as well as Sytnyk N.S. and Feliseyev V.A. [6], consider digital instruments from the perspective of business financing and alternative forms of fundraising. Marmul L. et al. provide a more applied and broader definition, which includes electronic money, contracts, and online financial documents.

Hrytsai S.O. [2] is the only one who clearly outlines the legal status of digital finance, viewing it as intangible objects that may acquire characteristics of a "digital thing".

The institutional aspect is present in the definitions of OECD [7] and the European Parliament [8], which provide systematized definitions oriented toward policy and regulation, with a focus on information and communication technologies and innovative platforms.

Despite the diversity of perspectives, several limitations within existing definitions can be observed:

- Havva V. [1] provides a definition that is overly narrow, excluding commonly used tools such as electronic bonds or digitalized versions of traditional securities from the scope of digital assets;
- in contrast, Marmul et al. [4] offer a definition that is excessively broad and insufficiently specific, lacking technical clarity and failing to distinguish digital financial instruments from general financial tools;
- the approach proposed by Kazakova N.A.
 and Stepanenko V.D. [5] focuses more on alternative financing mechanisms rather than specifically addressing the digital nature of the instruments in question;
- Chunitska I.I. and Bohrinovtseva L.M. [3] merely enumerate individual technologies without providing a synthesized or coherent definition of the concept;
- Hrytsai S.O. [2] presents a comprehensive and detailed definition; however, its complexity may hinder its applicability in practical contexts.

Therefore, the concept of "digital financial instruments" should be recognized as inherently

multidisciplinary, integrating technological, financial, legal, and regulatory dimensions. While this multidimensionality complicates the formulation of a universally accepted definition, it also allows for flexibility and adaptability depending on the field of application – be it finance, law, information technology, or public administration. The most robust definitions, such as those offered by Hrytsai S.O. or the OECD, adopt an integrated approach that considers these various dimensions concurrently.

Based on the foregoing analysis, digital financial instruments may be defined as financial assets and services that are created, managed, or delivered through the use of digital technologies—including blockchain, artificial intelligence, distributed ledger technologies, and information and communication technologies (ICTs). These instruments are capable of performing key financial functions such as exchange, value storage, settlement, and investment. They encompass a wide range of tools, including digital assets, electronic money, smart contracts, crowdfunding mechanisms, peer-to-peer (P2P) lending platforms, and other innovative solutions that can attain legal status and operate within both domestic and international financial systems.

The main types of digital financial instruments include [1–6]: electronic payment systems (PayPal, LiqPay, Apple Pay, etc.); crowdfunding platforms (UNITED24, GoFundMe); cryptocurrencies and tokens (Bitcoin, Ethe-reum, CBDC – central bank digital currencies); blockchain technologies for financing (smart contracts, asset tokenization); online banking and fintech solutions (Revolut, Monobank); electronic bonds and digital securities.

Use of digital instruments in Ukraine during wartime. During the war, Ukraine actively uses digital financial instruments to finance state needs:

- Creation of the UNITED24 platform, which combines crowdfunding for the Armed Forces, medical aid, and national recovery;
- Use of cryptocurrencies to quickly receive international donations without banking restrictions;
- Development of online banking and mobile services to ensure uninterrupted access to financial services;

Table 3

Key Facts about the UNITED24 Initiative

Category	Description
Purpose	Fundraising in support of Ukraine in the areas of defense, medical aid, reconstruction, education, and humanitarian assistance.
Operational Mechanism	Funds are transferred to the accounts of the National Bank of Ukraine and allocated by the respective ministries according to the directions specified by donors.
Transparency	Reports on the use of funds are updated weekly; audits are conducted by Deloitte and BDO.
Achievements	As of February 2025, over \$1.4 billion has been raised from donors in 110 countries worldwide.
Partners and Ambassadors	Andriy Shevchenko, Elina Svitolina, Imagine Dragons, Barbra Streisand, Mark Hamill, among others.

Source: systematized by the authors

 Electronic bonds like "eSupport" and war bonds to attract funds to the state budget.

The UNITED24 initiative is an official fundraising platform created by President Volodymyr Zelenskyy on May 5, 2022, to centralize donations in support of Ukraine during the war [9]. The platform ensures transparency and targeted use of the collected funds and serves as an effective tool for mobilizing international support (see Table 3).

The use of cryptocurrencies for international donations can be traced through the following initiatives:

- Aid For Ukraine project a joint initiative of Ukraine's Ministry of Digital Transformation, the cryptocurrency exchange FTX (before its shutdown), and the blockchain platform Everstake, which raised over \$60 million in cryptocurrencies to support the Armed Forces of Ukraine, humanitarian projects, and the purchase of equipment [10];
- Official state crypto wallets in February 2022,
 the Ukrainian government launched official cryptocurrency wallets to accept donations in Bitcoin, Ethereum,
 USDT, Polkadot, and other tokens. This allowed the country to bypass traditional banking restrictions, particularly for international transactions [11];
- Crypto fundraising by volunteers many volunteer organizations, such as KOLO and the Serhiy Prytula Foundation, opened cryptocurrency wallets to receive donations from abroad, as this method is convenient for contributions from the U.S., EU, and Asia [11].

The development of online banking and mobile services in Ukraine during the war manifested in the following ways:

 mobile banking apps (Monobank, Privat24, Sense SuperApp) continued to operate stably from the first days of the war, allowing users to pay utility bills, transfer funds, purchase war bonds, open deposits, and pay taxes online; introduction of digital payments and compensation mechanisms – through the "Diia" app, Ukrainians could apply for compensation for destroyed housing, receive aid under the "ePidtrymka" program, apply for unemployment benefits, and register for internally displaced status and corresponding financial support.

"ePidtrymka" electronic bonds are a form of war bonds that can be purchased through the "Diia" mobile application starting from October 2022 (Table 4). They enable citizens to invest their funds, including those received under the "ePidtrymka" program, to support the Armed Forces of Ukraine [12].

From October 2022 to May 2025, Ukrainians purchased over 13 million electronic war bonds via the "Diia" app, totaling 13.5 billion UAH, indicating growing popularity of this financial instrument.

Overall, Ukrainian citizens and businesses actively invest in war bonds, particularly those denominated in U.S. dollars (accounting for 60.6% of all war domestic government bonds in this currency). Non-residents also hold a small share of these bonds, mainly in UAH. In March 2025 alone, significant redemptions were made: over 20 billion UAH, 318 million USD, and nearly 320 million EUR [14]. These figures demonstrate the active involvement of the state, population, and business sector in internally financing the war effort (see Table 5).

Thus, Ukraine was able to adapt its financial infrastructure to the conditions of war thanks to digital technologies and the active use of cryptocurrencies.

To determine the potential and risks of using digital financial instruments during wartime, a SWOT analysis will be used, the results of which are presented in Table 6.

Digital financial instruments during wartime demonstrate significant *strengths*, including the speed of resource mobilization, which allows for rapid fundraising through online platforms. The use of blockchain technology ensures transaction transparency,

Table 4

Terms of Issuance and Circulation of "ePidtrymka" Electronic Bonds

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Parameter	Details				
Name	"ePidtrymka" Electronic Bonds				
Nominal Value	1,000 UAH / 1,000 USD / 1,000 EUR per bond				
Circulation Period	1 – 2.9 years in UAH; 1 year in USD or EUR				
Interest Rate	14.65% – 18.35% annually in UAH; 4.17% – 4.66% annually in USD; 3.22% – 3.24% annually in EUR				
Coupon Period	6 months				
Purchase Method	Via the "Diia" app; no commission for purchase or servicing				
Redemption	Nominal value and accrued interest returned to the "ePidtrymka" card				
Issue Volume	Up to 1 billion UAH to finance defense needs				
Additional Information	Details on available bond series and purchase process provided in "Diia"				
Available Bond Series	"Yevpatoriia," "Simferopol," "Yalta," "Nova Kakhovka," "Sevastopol," "Bakhchysarai," "Makiivka," and others				
Most Popular Series	"Yalta," "Nova Kakhovka," "Simferopol"				

Source: systematized by the authors on [12, 13]

Table 5
General Portfolio of Military Government Bonds (OVDPs) Owned by Residents and Non-residents
of Ukraine as of April 1, 2025

Parameter	UAH	USD	EUR
Maximum Yield (March 2025)	17.45% annually	4.50% annually	3.25% annually
Volume of military OVDPs held by citizens and businesses (as of April 1, 2025)	106,625.8 million UAH (32.6%)	1,612.9 million USD (60.6%)	168.8 million EUR (39.1%)
Total portfolio of military OVDPs owned by citizens and businesses	181.0 billion UAH	-	-
Volume of military OVDPs held by non-residents (as of April 1, 2025)	9,906.8 million UAH	28.1 million USD	0.1 million EUR
Redemption of military OVDPs (March 2025)	20,617.8 million UAH	318.4 million USD	319.7 million EUR
Total volume of funds raised through military bonds in the total amount of OVDPs during the entire martial law period	11.6%	_	-

Source: systematized by the authors

Table 6 **SWOT Analysis of Digital Financial Instruments in Wartime Conditions**

Strengths	Weaknesses
Rapid mobilization of resources Transaction transparency through blockchain technologies Accessibility for international support Flexibility in fund allocation Reduction of transaction costs Possibility to integrate insurance products into digital platforms	 High vulnerability to cyber threats Legal uncertainty regarding digital assets Volatility of cryptocurrencies Low financial literacy among parts of the population Potential loss of control due to transaction anonymity
Opportunities	Threats
 Development of financial technologies Activation of crowdfunding and volunteer movements Attraction of international investments Expansion of digital financial services Increased trust through platform transparency Development of InsurTech (insurance technologies) 	 Growth of cybercrime International sanctions on digital assets Capital outflow via cryptocurrencies Technical risks and system failures Information attacks through digital channels Lack of adequate client protection in case of cyberattacks on digital insurance services

Source: systematized by the authors

increasing public and international trust. The involvement of foreign donors is simplified, and the funds raised can be flexibly redistributed according to current needs. At the same time, transaction costs are reduced, and the development of digital insurance services (InsurTech) enables the implementation of online insurance for life, property, or war-related risks – this strengthens the financial security of the population even under crisis conditions.

However, digital tools also have *weaknesses*. Among them are high vulnerability to cyber threats, the volatility of cryptocurrencies that complicates financial forecasting, and a low level of financial literacy among parts of the population. Additionally, the lack of legal regulation of digital assets and insurance services on digital platforms creates risks of no guarantees for users. The anonymity of digital operations can also hinder effective oversight of financial flows.

At the same time, digital financial technologies open up new opportunities. They support the modernization of financial infrastructure, the development of crowdfunding and volunteer financing, and the attraction of international investments through global digital

platforms. The use of blockchain and smart contracts enables the implementation of new services, particularly in insurance – for example, automated processing and payments for insurance claims. Increased transparency of digital platforms may also positively influence trust in public financial governance.

Among the *threats*, it is important to highlight the rise in cybercrime, technical failures in digital infrastructure, and potential information attacks aimed at undermining trust in the financial system. Additional risks include capital outflows due to uncontrolled use of cryptocurrencies, as well as international restrictions on certain digital assets. The vulnerability of digital insurance services to fraud or technical failures may also affect users' financial stability.

To enhance the effective use of the potential of digital instruments, the following measures are advisable:

- Strengthening the protection of cyberspace and digital financial systems;
- Adoption of legislative acts to clearly regulate digital currencies and crowdfunding;
- Creation of state platforms for transparent fundraising and distribution;

- Development of public financial literacy programs;
- Ensuring international cooperation to attract external digital investments.

Conclusions. It has been determined that digital financial instruments have a multidisciplinary nature, encompassing technological, financial, legal, and regulatory aspects. A generalized definition of digital financial instruments has been proposed as assets and services created using modern digital technologies (blockchain, AI, distributed ledgers, ICT) that perform functions of exchange, investment, accumulation, and more.

The study revealed examples of the effective use of digital tools in Ukraine, such as the crowdfunding platform UNITED24, cryptocurrency donations, online banking, and electronic bonds. These instruments enabled the rapid, transparent mobilization of financial resources, independent of the constraints of the traditional banking system.

Thus, digital financial instruments play an important role in ensuring Ukraine's financial resilience during wartime. Their advantages include speed, flexibility, accessibility, and efficiency, while the main risks involve cyber threats, regulatory uncertainty, and the volatility of digital assets. Further development requires enhanced cybersecurity, improved legislation, the advancement of financial literacy, and the strengthening of international cooperation.

Future research should focus on analyzing the impact of digital tools on financial inclusion, studying emerging fintech technologies (particularly artificial intelligence in the financial sector), and developing state policies for the digital transformation of the financial system under conditions of instability.

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