BUSINESS ENTITIES’ FINANCIAL SECURITY UNDER DIGITAL ECONOMY

ABSTRACT

Business entities conduct operations and implement the strategy in a turbulent business environment. The modern business environment is characterized by rapid change and unpredictability of trends caused by both systemic factors (development of the digital economy) and non-systemic shocks (COVID-19 pandemic, sharp fluctuations in commodity prices, Russian armed aggression in Ukraine). That causes threats to companies’ financial security of companies. This paper aims to highlight the features of supporting financial security at the micro-level in the context of the digital economy’s development and to formulate proposals for ensuring companies’ financial security, taking into account the challenges of the exogenous and endogenous environment. The paper presents issues of the digital economy’s development, its impact on macro-and micro-level economic processes, and cause-and-effect relationships with the state of companies’ financial security. The influence mechanism of high-tech companies’ development in the context of financial security at the micro and macro levels is revealed with a special focus on the area of changes in capital expenditures and economic cycle phases. Emphasis is placed on the importance of using contemporary tools to analyze the essence and consequences of the phenomena inherent in the digital economy in the context of ensuring companies’ financial security. As a result of the analysis, a model for managing a company’s financial security under digital economy conditions is developed. The proposed model covers both micro- and macro-blocks of ensuring financial security. The importance of a combination of qualitative and quantitative methods for assessing a company’s financial security under conditions of the digital economy is emphasized. Within the framework of the model, a process approach to ensuring financial security at the company level is highlighted. The results of the paper may be used by state and local authorities to develop the principles of financial security management at the micro level under digital economy conditions, as well as by representatives of the scientific community to study the issues of companies’ financial security under conditions of the digital society development.

Keywords: financial security model, digitalization, network economy, financial technology, process approach

JEL Classification: G32, Q10, O16

INTRODUCTION

Today’s business environment is characterised by significant turbulence due to numerous exogenous and endogenous challenges that have begun to emerge with greater frequency. Among these challenges are the pandemic, Russian armed aggression, the potential food crisis, and others. At the same time, economic agents are forced to act not only under the influence of atypical hard-to-predict challenges which were mentioned above but also under the constant challenges inherent in socio-economic development in the XXI century. The initial challenge is the digitalization of the economy. Digitalization of the economy is the formation of a network of complexes of economic activity, business transactions, and professional connections, possibly by information and communication technologies (European Central Bank, 2022) [1]. As a result of digitalization, there are fundamental changes in socio-economic processes, fundamentally changing the behaviour of economic agents.
The impact of digitalization has been clearly demonstrated in the context of one of the atypical, hard-to-predict risks mentioned above, namely the COVID-19 pandemic. The coronavirus emerged in the fall of 2019 in Wuhan, China, and spread rapidly around the world in 2020. A striking feature of the socio-economic impact of the pandemic is that companies were affected both directly by COVID-19 and by restrictive government policies that were applied to contain the spread of the coronavirus disease. Thus, the COVID-19 pandemic changed the established order for all economic agents (households, companies, governments, NGOs) without exception, as economic agents were forced to adhere to regulatory measures and adapt their actions to the new realities. At the same time, digital economy solutions were actively applied, which allowed the continuation of economic activities and social contacts. The digitalization of companies and their employees, the restructuring of business models around digital sites and remote services, the introduction of online learning practices, and the transition to online doctor consultations are all examples of changes in the modern social and economic environment in the digital economy.

It should be noted that the coronavirus pandemic as a risk is characterized as “catastrophic” and “unpredictable”. In turn, companies are significantly vulnerable to this kind of risk - especially in economies with few resources to mitigate the effects of a socio-economic or financial and economic crisis. These manifests itself, in particular, in the destruction of established ties, the significant costs of securing company operations and employees, and the need to quickly rebuild established business models and approaches to doing business. All of this poses significant challenges for financial security in the digital economy.

**LITERATURE REVIEW**

A number of works are devoted to the problem of ensuring the financial security of companies in the digital economy.

An array of works gives their own interpretation of the concept of “financial security”. Khizhnyak (2018) [2] argues that the financial security of the company is a quantitative and qualitative determinant of its financial condition and provides primary protection of balanced financial interests from identified real and potential threats of internal and external nature, the parameters of which are determined based on the financial philosophy of the company. Khizhnyak (2018) [2] additionally considers financial security as a direction of development of the financial activity of the company, strengthening the state of socio-economic security, reliability, and safety, which indicates an established system of effective financial management of the company. The work emphasizes that imbalances in the formation and distribution of financial resources provoke the loss of financial security and require the company to respond quickly to these challenges. Kozachenko (2020) [3] defines financial security as protection from possible financial losses and bankruptcy, achieving the most effective use of corporate resources. The results obtained in Khizhnyak (2018) [2], Kozachenko (2020) [3] contributed to the study of the theoretical basis of financial security in the digital economy, carried out in this work.

A number of works consider the problem of financial security under the influence of drivers of fast-changing exogenous and endogenous environments. Müller et al. (2021) [4] consider the problem of financial security of companies in the context of the theory and practice of IFRS application. Zubko et.al. (2021) [5] examine the problem of ensuring financial security at the micro- and macro-levels in the context of the development of the digital economy, in particular, in the context of trade security. Kuznetsova & Pogorelenko (2021) [6] consider the problem of ensuring the financial security of companies in the digital economy in the aspects of the development of the financial sector of Ukraine. Tyutyunyk et.al. (2021) [7] examine the causal relationship between the level of spread of the shadow economy, the socio-economic state of the country, and the level of financial security of companies. Onyshchenko et.al. (2022) [8] consider the problems of development and implementation of innovations in the context of their impact on the financial security of the state. Kuznetsova et.al. (2021) [9] study the problem of ensuring financial security in the context of modern challenges of the turbulent exogenous environment, in particular the COVID-19 pandemic. The results of the above-mentioned works are used in this study as part of the development of a model to ensure the financial security of the company in the digital economy.

Separate works are devoted to the problems of developing a financial security plan and its implementation at the company level. Azarenkova et al. (2021) [10] study the tools to assess and predict the financial security of companies, taking into account the factors of the exogenous environment, in particular digitalization. Lipych & Skoruk (2020) [11] analyze the specifics of ensuring the financial security of companies in the digitalization of the economy, in particular through an adequate action plan for financial security. The above works contributed to the development of the process approach to ensure the financial security of the company within the model proposed in this study.

However, the problem of ensuring the financial security of companies in the context of today's digitalization challenges has not been sufficiently studied.
AIMS AND OBJECTIVES

The purpose of the article is to analyze the features of financial security of companies in the context of the development of the digital economy.

The objectives of the article are:

- to examine the concept of financial security of the company in the light of the development of the digital economy;
- to analyze trends in managing the financial security of companies in the context of the digital economy;
- formulate proposals for managing the financial security of companies, taking into account the problems of digitalization.

METHODS

In accordance with the goals and objectives of the study, let us describe the order, methodological basis, and information base of the analysis. In order to study the problem of ensuring the financial security of the company in the context of the development of the digital economy, this study used the method of synthesis to identify trends of changes in the financial security of companies in the context of digitalization; the method of retrospective analysis - to summarize the course of the digitalization of the economy and changes in the financial security of companies; structural-logical method - to form a model of financial security management in the digital economy; graphic method

The information base of the analysis is the research of leading scientists in the field of financial security and digitalization of the economy, reports, and analytical notes of leading analytical centres.

RESULTS

The digital economy is significantly changing the business environment, particularly in the context of the financial security of companies. Digitalization of the economy primarily involves the active use of the latest technologies, which in ideal conditions should simplify the work of economic agents. However, in practice, the digitalization of the economy leads both to the increased economic activity of companies and to the complication of strategic planning, implementation of changes, and adaptation of companies to the current business environment.

It should be noted that the digital economy affects changes not only at the micro-level - that is, individual companies - but also at the macro level - that is, a set of macroeconomic policies. The increased level of flexibility of the new environment in the context of the digital economy is an argument for balancing fiscal and monetary policy measures. This requires a solution to the problem of assessing the potential level of production in the national economy when the level of productivity changes. In the context of the financial sector, digitalization involves not only solving the problems of changing the behaviour of consumers of financial services, knowledge, and skills of personnel, new working conditions, and service delivery. The digital economy in the financial sector also brings challenges to the work of regulators, as well as to the top management of financial corporations. In particular, these are changes in the environment of interest rates, commodities, and the international movement of capital.

In light of this, researchers try to study and describe the structural changes taking place in the context of technological development in different sectors and their systemic implications, in particular in the context of the financial security of companies. A fundamental observation with important implications for financial stability is that digitalization leads to a significant accumulation of intangible capital, potentially creating financial instability. For example, according to Li (2017) [12], the active development of R&D by high-tech companies leads to the formation of significant intangible assets, and stimulates further creation of financial capital by financial intermediaries, through borrowed or equity capital entering high-tech companies.

During the favourable phase of the economic cycle the cost of capital increases. This encourages companies to create more capital, but they must accumulate cash in order to do so. This in turn leads to more leverage of financial intermediaries and higher costs of capital. Thus, digitalization of the economy in favourable phases of the economic cycle stimulates both growth of the national economy as a whole and the strengthening of financial security, but in the phase of economic recession, high-tech development can create significant economic instability, in particular in terms of damage to the financial security of companies, namely the blowing of the financial bubble.
In the financial sector, the above-mentioned high-tech development is mainly generated around FinTech companies, embracing digital innovations and the latest high-tech business models in the financial sector. FinTech innovation can disrupt existing established industry boundaries and the structure of traditional sectors of the national economy, blurring those boundaries. From this perspective, Dasgupta (2020) [13] describes the historical evolution of banks and banking innovation. In particular, according to Dasgupta (2020) [13] in the 1950s and 1960s market behaviour and innovation of large American banks led to processes of financial instability, and the accumulated effect of market development of large American banks largely led to financial instability in the 1980s institutional problems A similar situation developed in the early 2000s in the development of megabanks, culminating in the form of the global financial and economic crisis. This reflects the significant impact of the digital economy on financial security at both the macro and micro levels.

It should be noted that innovations with a focus on digitalization and FinTech cannot be viewed using traditional approaches, in particular the buyer-seller model. This is due to the fact that modern digital products and services are provided through platforms characteristic of the network economy. This business model involves the principle of cross-subsidization, which has a significant impact on the issue of financial security.

This has a significant impact on how companies operate in rapidly changing exogenous and endogenous environments, requiring companies to adapt quickly and implement a range of financial security measures. This, in turn, necessitates the development of a model for managing a company’s financial security in the digital economy. One of the key criteria for the effective application of such a model is an adequate assessment of the state of the company’s financial security, taking into account the specifics of state policy in the direction of financial security, and analysis of qualitative and quantitative factors affecting the company's financial security. It is important to note that the evaluation of the state of financial security should not primarily take place from the standpoint of an accounting approach, based purely on accounting and financial reporting data, but based on a stakeholder approach when the decisions made are based on the specific motivation for the fulfillment of a special task of a group of stakeholders. The model of a company’s financial security in the digital economy is presented in Figure 1.

![Figure 1. A model for managing the financial security of a company in the digital economy.](image-url)
From the proposed model, we see that the work on ensuring the financial security of the company in the digital economy takes place within the hierarchy "digital economy - financial security of the state - financial security of companies". This determines the peculiarities of analysis and decision-making within the proposed model, in particular, in the context of involvement in the analysis of a ramified range of factors of the exogenous and endogenous environment. In the framework of the model, the impact factors are divided into 2 subgroups, namely qualitative and quantitative. It is important to balance the mentioned factors adequately to the task within a specific company. Special attention should be paid to the proposed process approach to company financial security management in the frame of the proposed model. The process approach is an advantage of integrating financial security management into other business processes of a company. Another advantage of the proposed model is the ease of its use and implementation - a suitable specialist can analyze and make decisions on the financial security of the company using the proposed model - without involving a separate manager.

The key tool that allows the adequate operation of the model proposed above is the analysis of the company's financial security risks. The vision of the selected financial security risks is presented in Table 1.

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<th>Table 1. Company financial security risks.</th>
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<td><strong>Risk</strong></td>
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<td>Market risk</td>
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<td>Liquidity risk</td>
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<td>Credit risk</td>
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It should be noted that the selected risks of the financial security of the company are among the most common. The company needs to formulate an adequate approach to monitoring, control, and assessment of these risks. It should be noted that the selected financial security risks are at the intersection of the financial and market position of the company, which leads to the complexity of the task of assessing these risks, planning measures to minimize them, and implementation of existing plans.

Current events demonstrate the vulnerability of companies to exogenous shocks affecting the state of financial security. A striking example is the COVID-19 pandemic and the socio-economic crisis caused by the pandemic and restrictive measures taken by governments. It should be noted that despite the medical nature of this crisis, the set of micro-level measures is based primarily on economic and financial foundations. As an example of measures to mitigate the socio-economic crisis caused by COVID-19, a set of recommendations is presented (Table 2).

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<th>Table 2. Areas of work to restore the financial security of the company in the challenges of today's exogenous environment. (Source: adapted from Félix, García (2020) [14]; ECLAC (2022) [15]; Macías (2021) [16]; own analysis of the authors)</th>
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<td><strong>Course of action</strong></td>
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<td>Financing</td>
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<td>Operational financial management</td>
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Summarizing the recommendations presented in Table 2, economic recovery under the challenges of today's exogenous environment involves planning and implementing a set of measures. Key efforts should focus on financing, operational financial management, government support, and human capital. The set of measures should be aimed at balancing the current needs of ensuring financial security and the long-term development of companies.

To summarize, the organization and functioning of an internal control system for financial security should be based on the principles of comprehensiveness, timeliness, continuity, legality, and consideration for the sectoral specialization of the
business. The principle of comprehensiveness consists in ensuring the safety of personnel, company assets, information databases, and confidentiality of information from all types of dangers by the methods available. This is achieved through a personnel selection policy, the use of technical means of security and information protection, and the development of information and analytical activities aimed at preventing potential risks to the company's financial security. The principles of timeliness and continuity imply a system of constant monitoring, prevention, and warning about the current and future state of the company, which is ensured by constant analysis and forecasting of threats to the company's security, as well as the development of effective protection measures.

Note that the problems of ensuring the financial security of the company are associated with increasing instability in the economy due to the financial crisis, with fluctuations in commodity prices and subsequent political decisions and economic sanctions, which ultimately lead to an increase in financial risks for all companies. Financial stability is an indicator of a company's financial security, as it reflects the efficiency of financial management within the company, and shows how stably the company can develop under conditions of high micro- and macro risks. It is especially relevant for small and medium-sized businesses, which is one of the most important subsystems of the market economy.

The development and operation of a financial security system should be carried out in accordance with the legal framework in the field of entrepreneurship, information protection, and other security regulations. Monitoring of financial security under the proposed model is available to any company regardless of its scale and type of activity. Moreover, it does not require large financial investments, which is especially important in conditions of low provision of small and medium businesses with their own financial resources, significant competition, and economic uncertainty.

**DISCUSSION**

Thus, the peculiarities of financial security in the digitalization of the economy are established. The results of this study are confirmed by the previously obtained results. Let us disclose the results in greater detail.

Ensuring financial security through digital tools is a key condition for companies in today's turbulent environment. This result finds confirmation in Kotkovskyy et al. (2020) [17], which argues for the expediency of the future implementation of the principle of "digital financial security" as one of the key elements of the innovative proposal of the financial security management system of companies. In particular, it is proposed to use an economic and mathematical model to assess financial security according to the profitability criterion, as well as to improve the management of financial security of companies based on individual segments of the digitization system.

This study proposes the implementation of a comprehensive program for the development of market, financial, and organizational abilities of companies in the context of financial security on the medium- and long-term horizon. This finds its feedback in previous studies, in particular, Ramskyi & Solon’ko (2018) [18] in this plane considered models of company behaviour that determine its readiness for adaptation, as well as models in the context of the life cycle of the company. Ramskyi & Solon’ko (2018) [18] also consider the theoretical and practical processes of cyclical development of companies, allowing managers to make informed managerial decisions in the future. In particular, these are models of company behaviour, determining its readiness for adaptation and models in the context of the life cycle (Melnyk & Silkin, 2021) [19].

This study proposed a logically structured scheme of the hierarchy of financial security of the company. This is supported by earlier works. Dokiienko et al. (2021) [20] in the context of the company, abilities formed a system of a comprehensive assessment of the degrees of the main components of the financial security of the operating activities of companies. In order to determine the boundaries of operational security of companies, Dokiienko et.al. (2021) [20] proposed a diagnostic matrix of the state of financial security of operating activities of companies (on the example of the oil and fat industry). Kondratenko et al. (2021) [21] propose a general scheme of organizational and methodological support for the management of the financial and economic security of the company. The proposed scheme of ensuring financial security is based on the results of the analysis of heterogeneous factors that determine the state of the company and trends in its development, demonstrating the necessary set of measures to improve the level of financial security of the company. Pronoza et al. (2022) [22] propose to use a regression model tool, which will allow the company management to monitor the impact of deterministic factors on changes in the level of financial security of the company and adjust the process of making management decisions on its financial security.
However, the result of this study, which is to develop a model for managing the financial security of companies in the digital economy, is not reflected in previous studies. In particular, this study notes the importance of embracing both micro- and macro-level drivers when providing financial strategy in a digitalized environment. This study also points to the need for an integrated financial security management system for the company, which should include various aspects that are integrated into a single set of measures. Additionally, this study emphasizes the importance of an expanded view of the practical aspects of ensuring the financial security of the company, covering market, financial, organizational, and legal aspects, as well as a process approach to the task of ensuring financial security.

**CONCLUSIONS**

To summarize, ensuring the financial security of companies in the digital economy is a complex task, which is complicated by the growing turbulence of the exogenous and endogenous environment in which companies operate. Digitalization involves the transition to a networked economy, the focus on platforms for providing products and services, and the application of the latest business models (in particular, the cross-subsidization model typical of the FinTech market). All this entails the need to update approaches to ensuring the financial security of companies.

According to the results of the study, the mechanism of impact of high-tech companies on financial security at micro- and macro-levels in the plane of changes in the cost of capital and changes in the phases of the economic cycle is disclosed. It is noted that the development of high-tech companies has a significant impact on the financial stability of the national and global economy due to the implementation of the capital flow mechanism.

As part of the task of ensuring the financial security of companies in a digital economy, a financial security management model has been developed, covering both micro- and macro-level drivers. The proposed model is built according to the hierarchy "digital economy - financial security of the state - financial security of companies". The importance of the balanced use of quantitative and qualitative methods for assessing the financial security of companies in the digital economy was noted. A process approach to ensuring financial security at the company level was proposed. The importance of an integrated approach to engaging various aspects of a company's endogenous environment in the task of ensuring its financial security was noted separately.

Prospects for future research include the study of a wider range of drivers of the exogenous and endogenous environment of the digital economy, which influence the state of financial security of companies. The problem of the impact of changes in interest rates and the dynamics of commodity prices, which are changing rapidly in the current environment, requires special attention.

**REFERENCES**


ФІНАНСОВА БЕЗПЕКА СУБ’ЄКТІВ ПІДПРИЄМНИЦТВА В УМОВАХ ЦИФРОВОЇ ЕКОНОМІКИ

Суб’єкти підприємництва здійснюють операційну діяльність і запроваджують стратегію в турбулентних умовах бізнес-середовища. Сучасному бізнес-середовищу притаманна швидкісність і непередбачуваність трендів, що спричинені як системними факторами (розвиток цифрової економіки), так і несистемними шоками (пандемія COVID-19, різкі коливання цін на сировинні товари, російська збройна агресія в Україні). Це спричиняє загрози фінансовій безпеці компаній. Метою статті є визначення особливостей підтримки фінансової безпеки на мікрорівні в контексті розвитку цифрової економіки та формування пропозицій щодо забезпечення фінансової безпеки компаній з урахуванням впливів екзогенного та ендогенного середовища. У статті розглянуто проблематику розвитку цифрової економіки, її впливу на економічні процеси макро- та мікрорівні, причинно-наслідкові зв’язки зі станом фінансової безпеки компаній. Розкрито механізм упливу розвитку високотехнологічних компаній на фінансову безпеку на мікрорівні. У контексті забезпечення фінансової безпеки компаній. У результаті здійсненого аналізу розроблено модель управління фінансовою безпекою компанії в умовах цифрової економіки. Запропонована модель охоплює як мікрорівні, так і макрорівні забезпечення фінансової безпеки. Окремо акцентована важливість поєднання кількісних та якісних методів оцінки фінансової безпеки компаній у рамках моделі. Результати роботи можуть бути використані органами державної та місцевої влади для розробки принципів управління фінансовою безпекою на мікрорівні в умовах цифрової економіки, а також представниками наукової спільноти для дослідження проблем фінансової безпеки компаній в умовах цифрового суспільства.

Ключові слова: модель фінансової безпеки, цифровізація, мережева економіка, фінансові технології, процесний підхід

JEL Класифікація: G32, Q10, O16