

REDUCING THREATS TO FINANCIAL SECURITY AND INNOVATIVE DEVELOPMENT OF ENTERPRISES UNDER THE INFLUENCE OF SCIENTIFIC AND TECHNOLOGICAL PROGRESS

REDUÇÃO DAS AMEAÇAS À SEGURANÇA FINANCEIRA E DESENVOLVIMENTO INOVADOR DE EMPRESAS SOB INFLUÊNCIA DO PROGRESSO CIENTÍFICO E TECNOLÓGICO

REDUCCIÓN DE LAS AMENAZAS A LA SEGURIDAD FINANCIERA Y DESARROLLO INNOVADOR DE LAS EMPRESAS BAJO LA INFLUENCIA DEL PROGRESO CIENTÍFICO Y TECNOLÓGICO

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ABSTRACT: Among the problematic issues of enterprise management, the most relevant are the issues of managing the innovative development of enterprises (IDE) and controlling the processes of ensuring their financial security (FSE). The purpose of the article is to identify the key components of financial security and the innovative development of an industrial enterprise that need to be taken into account when making managerial decisions. The authors have concluded that the relationship between the prevention of threats of FSE and IDE has a dual character, which necessitates an integrated approach to their management, based on their consideration as two inextricably linked and mutually influencing levers of management efficiency, and the allocation based on their integration of the financial security of IDE as a separate research subject and object of management.

KEYWORDS: Threats. System. Financial security of an enterprise.

RESUMO: *Dentre as questões problemáticas da gestão empresarial, as mais relevantes são as questões da gestão do desenvolvimento inovador das empresas e do controle dos processos*

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de garantia de sua segurança financeira. O objetivo do artigo é identificar os principais componentes da segurança financeira e do desenvolvimento inovador de uma empresa industrial que precisam ser levados em consideração na tomada de decisões gerenciais. Os autores concluíram que a relação entre a prevenção de ameaças de segurança financeira e desenvolvimento inovador de uma empresa tem um caráter dual, que necessita de uma abordagem integrada para sua gestão, com base em sua consideração como duas alavancas de eficiência de gestão inextricavelmente ligadas e mutuamente influenciadas, e a alocação baseada em sua integração da segurança financeira do desenvolvimento inovador da empresa como um assunto de pesquisa separado e objeto de gestão.

PALAVRAS-CHAVE: Ameaças. Sistema. Segurança financeira de uma empresa.

RESUMEN: *Entre los temas problemáticos de la gestión empresarial, los más relevantes son los de gestionar el desarrollo innovador de las empresas y controlar los procesos para garantizar su seguridad financiera. El propósito del artículo es identificar los componentes clave de la seguridad financiera y el desarrollo innovador de una empresa industrial que deben tenerse en cuenta al tomar decisiones de gestión. Los autores han concluido que la relación entre la prevención de amenazas de seguridad financiera y desarrollo innovador de una empresa tiene un carácter dual, que requiere un enfoque integrado de su gestión, basado en su consideración como dos palancas de eficiencia de gestión indisolublemente vinculadas y que se influyen mutuamente, y la asignación basada en su integración de la seguridad financiera del desarrollo innovador de la empresa como sujeto de investigación separado y objeto de gestión.*

PALABRAS CLAVE: Amenazas. Sistema. Seguridad financiera de una empresa.

Introduction

From the perspective of the system approach, the enterprise is a complex open dynamic system that is in the process of constant resource exchange with the external environment. In the system of economic security of an enterprise, financial security is one of the most significant components (AIZENMAN; JINJARAK; LEE; PARK, 2016; GUKOV; ANIKIN, 2016).

Researchers (VOROBYEV; PORITSKY, 2015) emphasize the absolute priority of the financial component of the economic security of enterprises since it acts as a unifying basis for creating conditions of economic security. That is why the enterprise management should pay particular emphasis to the issue of ensuring financial security since the non-aversion of threats to financial security can lead to bankruptcy and further liquidation of the enterprise.

At that, in the last decade, the management of both the processes of ensuring the financial security of an enterprise (FSE) and the innovative development of an enterprise (IDE) remains the most relevant problem among the problematic issues of enterprise



management in the real sector of the economy. Any enterprise on the market operates in competitive conditions and therefore needs effective tools to simultaneously influence the threats of the FSE and the IDE. However, the implementation of any innovations in the economic activities of enterprises entails certain risks, including financial security risks.

Researchers (BULYGIN; IVANOVA, 2021; GURINOVICH; SMIRNIKOVA, 2021; KARMANOV; KISELEVA; KUZNETSOV; SADOVNIKOVA, 2021; KUZENKO; USENKO, 2011) note a sufficiently large number of threats to the FSE, therefore it is necessary to consider all threats taken together to conduct a full-fledged analysis of the company's activities. The entire threat system of the FSE can be represented as a dynamic structure that has an interrelated system, and thus the occurrence of one threat can lead to the appearance of another and strengthen the overall impact on the company's activities. The possible consequences of the onset of real threats can manifest themselves in the form of losses, namely, direct losses (of capital, income, resources) or indirect losses (deterioration of the company's image, the outflow of qualified personnel, lost commercial interest, unrealized business projects) (AVEN, 2016). Note that threats to the financial security of a business entity are often critical and unpredictable often leading to bankruptcy. Thus, the problem of financial security is urgent and determines the need for further search for its solution.

Until now, FSE and IDE, as objects of management, are mainly studied separately from each other. However, today's realities of the industrial enterprises' activities in the context of numerous external threats (market, political, environmental, etc.) and the need for their sustainable development on an innovative basis aimed at preserving and strengthening competitive positions, require a study of the relationship and mutual influence of the enterprise's financial security and innovative development phenomena.

The purpose of the article is to identify the key components of financial security and the innovative development of an industrial enterprise that need to be taken into account when making managerial decisions.

Literature review

Until now the concept of financial security of the enterprise is interpreted by specialists in different ways, often identifying with the concept of the financial component of economic security or combining them in the concept of financial and economic security of the enterprise (Table 1).



Table 1 – Definition of the concept of FSE

Source	Concept
Karenina (2015)	The FSE means protection against possible financial costs and prevention of bankruptcy of an enterprise, achieving the most efficient use of corporate resources; it is the FSE that is leading and decisive since in market conditions of management finance is the driver of any economic system.
Blazhevich and Kirilchuk (2015)	The FSE means the most efficient use of corporate resources, reflected in the optimal values of financial indicators of profitability and cost-effectiveness of the business, the quality of management, the use of fixed and current assets of the enterprise, the structure of its capital, the rate of dividend payments on securities, as well as the exchange rate of its securities as a synthetic indicator of the current financial and economic condition of the enterprise and the prospects of its technological and financial development.
Vagina (2016)	The FSE is a component of the economic security of the enterprise, which is based on the independence, efficiency, and competitiveness of the company's finances, and is reflected through a set of criteria and indicators of its condition, characterizing the balance of finances, sufficient liquidity of assets, the availability of necessary cash reserves, as well as financial stability.
Charaeva, Karpova and Chumachenko (2019)	The FSE means the ability of an enterprise to effectively and stably carry out its economic activities by using a set of interrelated diagnostics, instrumental, and control measures of a financial nature, which should optimize the use of financial resources, ensure their level, and neutralize the impact of risks of the internal and external environment.
Giambona, Graham, Harvey and Bodnar (2018)	The FSE means the financial component of an enterprise's economic security, i.e., a set of factors that ensure independence, stability, and the ability to progress in conditions of destabilizing economic factors.
H. D. PLATT and M. B. PLATT (2006)	The FSE means the financial condition, which is characterized by balance, resistance to internal and external impacts, allows ensuring the effective operation of the enterprise due to the optimal attraction of property transferred by the founders to management in the long term.
CULP (2002)	The FSE is the process of achieving such an equilibrium state of the system in which no factors are creating the danger of its destruction.

Source: Prepared by the authors

According to researchers (DELAS; NOSOVA; YAFINOVYCH, 2015), the FSE is determined by the following key factors: 1) the level of resource availability; 2) the stability and sustainability of the financial condition of the enterprise; 3) the balance of financial flows and settlement relations; 4) the degree of efficiency of financial and economic activity.

Accordingly, the FSE represents such a state of the enterprise that allows ensuring its financial equilibrium, stability, solvency, and liquidity in the long term (DURNEVA, 2013); meets its needs for financial resources for its sustainably expanded reproduction (OVECHKINA, 2013); provides its sufficient financial independence (TRUICA; TRANDAFIR, 2009); provides the ability to withstand possible threats that can cause

financial damage to it (BELÁS; DVORSKÝ; KUBÁLEK; SMRČKA, 2018); and as a result, ensures the protection of the financial interests of its owners (ZAPOROZHITSEVA; RYABYKH, 2013; ZAMBRZHITSKAYA; TIKHONOVA; ISAEVA; LAMI; GOUTORBE, 2020).

Some experts even consider the FSE as a set of dynamic quantitative and qualitative characteristics of the level of the financial condition of the enterprise, which ensures balance and protection of its priority financial interests against threats of various kinds, as well as financial support for sustainable development (GASPARIAN; KISELEVA; TITOV; SYSOEV; CHERNYSHEVA, 2021; HE; MA, 2021).

At that, according to researchers (DUDIN; FROLOVA; PROTOPOPOVA; MAMEDOV; ODINTSOV, 2019; ZHAO; ZENG, 2014), the sources of threats to the FSE can be both conscious and unconscious actions of individual officials and business entities (public authorities, international organizations, competing enterprises), as well as a confluence of objective circumstances (the state of financial conjuncture in the markets of this enterprise, scientific discoveries, and technological developments, force majeure, etc.).

Depending on the subjective conditionality, threats to the FSE may have an objective and subjective nature. Objective circumstances are considered to be such threats that arise not through the fault of a particular enterprise or its employees. Threats that result from the inefficient operation of the enterprise in general or its employees (primarily managers and functional managers) are considered subjective (BURTSEV, 2015; VINICHENKO; KLEMENTYEV; RYBAKOVA; MALYSHEV; MALYSHEVA, 2021).

While going back to the studies of the essence of IRP, a generalization of existing approaches of specialists allowed formulating the following definition of the IRP from the perspective of the process (1) and result (2):

- 1) IRP is the process of development through the formation and use of innovative potential, aimed at qualitative changes in the enterprise condition (BALASUBRAMANIAN; LEE, 2008; CASTELLACCI; NATERA, 2013; MARKOVA; LISTOPAD; SHELYGOV; FEDOROV; KISELEVICH, 2021);
- 2) IRP is the positive qualitative changes in the enterprise condition resulting from the implementation of innovative activities, the formation and effective use of innovative potential (COAD; SEGARRA; TERUEL, 2016; GUNDAY; ULUSOY; KILIC; ALPKAN, 2011).



The hypothesis of the present study is as follows: the relationship between the prevention of threats to FSE and IDE has a dual character, where both phenomena act as the goal of the enterprise and the means to achieve it.

Research objectives:

- To determine the threat of loss of FSE based on the analysis of scientific literature;
- To analyze the main functions and tasks of the FSE system to prevent threats;
- To substantiate the relationship between the prevention of threats to FSE and the IDE.

The article consists of an introduction, a literature review, research methods, research results, their discussion, and conclusion.

Methods

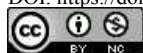
During the research, the methods of theoretical analysis of scientific sources devoted to the problem under study were used, as well as the case study method, which was carried out by the analysis of an example of the relationship between the prevention of threats to FSE and IDE. The main criteria for choosing the case were the widespread implementation of innovations into the economic activity of the enterprise, as well as the presence of threats to the financial security of the company.

At the first stage of the study, the sources of information necessary for achieving the research goal were selected. The data for this study were taken from a review of secondary sources. The source base of the study was represented by two arrays of literature.

The first array consisted of articles published in journals, indexed by Scopus and Web of Science, collective monographs, dissertation research aimed at studying the essence of FSE, types of threats to its loss, functions, and tasks of the financial security system of an enterprise to prevent threats.

The second array consisted of articles published in journals, indexed by Scopus and Web of Science, aimed at analyzing the essence of the IDE.

At the second stage of the study, the analysis of literary sources was carried out. The analysis of the research source base was carried out using the methods of theoretical generalization, comparative analysis, analysis, and synthesis.



Results

The analysis of the scientific literature allowed identifying two key views on the essence of the FSE:

- 1) From the perspective of the result (static standpoint), where the FSE is considered as a certain state (position) of the enterprise or the level of its condition (DELAS; NOSOVA; YAFINOVYCH, 2015; HE; MA, 2021);
- 2) From the perspective of the process (dynamic standpoint), where FSE is considered as an activity aimed at achieving a certain condition (DURNEVA, 2013; OVECHKINA, 2013).

At that, from the perspective of the emergence of threats to FSE, researchers (HE; MA, 2021) define it as the state of an enterprise in which it achieves prevention, weakening, or protection against existing dangers and threats or other unforeseen circumstances and ensures the achievement of business goals in conditions of competition and economic risk through most efficient use of resources.

The analysis of several scientific papers allows stating that the threats of loss of FBP can be formulated as follows (Table 2).

Table 2 – Threats to FSE

No	Threats to FSE	Sources
1	Existing of potential event or factor that endangers the implementation of the financial interests of the enterprise.	He and Ma (2021); H. D. Platt and M. B. Platt (2006)
2	Potential or actual actions of individuals or entities which violate the security of the business entity and can lead to the termination of its performance, or financial and other losses.	Culp (2002); Truica and Trandafir (2009)
3	The possible negative consequence of the impact of environmental factors and internal evolution of a company to its financial condition.	Blazhevich and Kirilchuk (2015); Ovechkina (2013)
4	The status of some factor of its external or internal environment (or their combination), may directly or being transformed affect adversely the financial condition and (or) the financial interests of the company, to reduce its financial stability, or to prevent it's from financial development.	Durneva (2013); Vagina (2016)

5	Actual or potential manifestation of the destructive impact of various factors on the financial development of the company, leading to some economic loss.	Belás, Dvorský, Kubálek and Smrčka (2018); Giambona, Graham, Harvey and Bodnar (2018)
6	An existing or potentially possible phenomenon or action that creates a danger to the implementation of the financial interests of the enterprise and prevents the effective use of available resources and market opportunities.	Zaporozhtseva and Ryabykh (2013)

Source: Prepared by the authors

Consequently, the threat of loss of the FSE is a real or potential possibility of the destructive impact of various factors on the financial development of the enterprise, which leads to certain economic damage.

In turn, the FSE system is designed to perform certain functions, of which the main ones are presented in Table 3.

Table 3 – Main functions of the FSE system

No	Functions of the FSE system	Source
1	Forecasting, detection, prevention, and mitigation of hazards and threats	Giambona, Graham, Harvey and Bodnar (2018); Culp (2002)
2	Ensuring the security of the company's activities and its personnel, as well as the safety of the property	Durneva (2013); H. D. Platt and M. B. Platt (2006)
3	Creating a charitable competitive environment	He and Ma (2021); Truica and Trandafir (2009)
4	Elimination of the consequences of the damage caused	Burtsev (2015); Durneva (2013)

Source: Prepared by the authors

The purpose of the FSE system is the timely identification and prevention of both external and internal hazards and threats, ensuring the security of the enterprise's performance and achieving its business goals. Certainly, achieving this goal is possible only based on solving a set of tasks, of which the most significant are presented in Table 4.

Table 4 – The main tasks of the FSE system

No	The main tasks of the FSE system	Source
1	Identifying real and predicting potential hazards and threats	Charaeva, Karpova and Chumachenko (2019); Vagina (2016)
2	Identifying the FSE indicators and adjusting them depending on changes in the condition of the external environment, goals, and objectives of the enterprise	Delas, Nosova and Yafinovich (2015); Giambona, Graham, Harvey and Bodnar (2018)
3	Finding ways to prevent, mitigate or eliminate the consequences of exposure to hazards and threats	Culp (2002); Delas, Nosova and Yafinovich (2015)
4	Developing the FSE monitoring system	Belás, Dvorský, Kubálek and Smrčka (2018); Ovechkina (2013)
5	Finding the opportunities and means necessary to ensure FSE	Belás, Dvorský, Kubálek and Smrčka (2018); Truica and Trandafir (2009)
6	Developing measures aimed at ensuring FSE (both in the short and long term)	Charaeva, Karpova and Chumachenko (2019); Culp (2002)
7	Analyzing the implementation of measures, carrying out their assessment and adjustment	Zaporozhtseva and Ryabykh (2013)
8	Organizing interaction with law enforcement and regulatory authorities to prevent and suppress offenses directed against the interests of the enterprise	Charaeva, Karpova and Chumachenko (2019); Karenina (2015)

9	Creating in-house security service of the enterprise, capable of preventing the dangers and threats	Delas, Nosova and Yafinovich (2015); Vagina (2016)
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Source: Prepared by the authors

Discussion

According to Coad, Segarra and Teruel (2016), the IDE is based on the innovative potential, its formation, and its use in innovation activities.

Based on the principle of the accounting balance sheet, the following three key components of the IDE can be distinguished: financial, material, and intellectual, which are in a cyclical interrelationship. The same components concern the innovative potential or the potential of IDE (ROSNEFT, 2020, 2021).

The financial component contains the actual financial resources, which are the source of forming the material and intellectual components. The material component is determined according to the material resources, and the intellectual component is determined in a consistent relationship of intellectual resources (assets), intellectual potential, and intellectual capital.

The structure and level of efficiency of using material and intellectual components affect the financial condition, financial results, and the increase of the financial component as a necessary investment resource to ensure the further development of the enterprise. The IDE should be ensured by the effective integrated use of all components of its potential; however, it is believed that it is in the conditions of innovative development that the intellectual component becomes more influential than the material one (BALASUBRAMANIAN; LEE, 2008).

In this context, the FSE embodies the necessary prerequisite, and its level is a reflection of the financial potential of the IDE. Accordingly, the intellectual component of innovative development should be reflected in the level of intellectual security (this phenomenon requires further separate research).

In conjunction with the foregoing, enterprises with a low level of financial security require an immediate start of innovative development processes (otherwise they will face bankruptcy); however, they do not have the necessary financial potential for this. On the other hand, the emergence of threats to FSE may be a consequence of the same development processes, especially at their initial stage (CULP, 2002). As shown in Castellacci and Natera

(2013), the initial stage of innovation and investment processes (especially when it comes to large-scale innovation and investment projects) in the short term leads to an increase in the value of property in terms of noncurrent assets and reserves against the background, as a rule, of an increase in the cost of borrowed capital and its maintenance costs, a constant level or a slight increase in revenue from the sale of products, works, and services. This, in turn, leads to a deterioration in indicators of financial independence, turnover, and return on capital, which is taken into account in almost all known integral models of bankruptcy forecasting and corresponding approaches to assessing the level of FSE.

It can be concluded that the relationship between the prevention of threats to FSE and IDE has a dual character, where both phenomena act as the goal of the enterprise and the means to achieve it. Prevention of threats to FSE, on the one hand, is a necessary prerequisite and a certain reflection of the development potential, because the processes of its provision are aimed at ensuring the development processes. On the other hand, the enterprise development process should be aimed, in particular, at forming and functioning systems for preventing threats to financial security. Under contemporary economic conditions, against the background of the latest threats and risks caused, among other things, by the manifestations of scientific and technological progress, preserving FSE requires a high degree of innovative development (DELAS; NOSOVA; YAFINOVYCH, 2015). At the same time, the innovative development processes that make changes to the internal environment of the enterprise, and cause an adequate response of the external environment, cause additional risks, disrupting the state of the FSE (TRUICA; TRANDAFIR, 2009). Consequently, the IDE may contain not only means of ensuring its financial security but also an internal threat to its condition.

In conjunction with the foregoing, the authors suggest that the FSE management be carried out in two modes:

- 1) In conditions of stable performance of the enterprise;
- 2) In the context of innovation activities.

The management functions of the FSE in the context of stable performance of the enterprise include the following components: forming effective information systems that justify alternative management decisions; conducting analysis of the state of the FSE; developing the FSE planning system; and creating the FSE internal control system.

In our opinion, the strategy of the FSE management in the context of implementing innovation should include the following components: diagnosing crisis developments due to the implementation of innovations; separating objective and subjective negative impacts due



to the implementation of innovations; determining the list of measures to prevent threats to the FSE; evaluating the effectiveness of planned measures in terms of neutralizing negative impacts; assessing the cost of proposed measures to eliminate threats to the FSE.

Final considerations

In conjunction with the foregoing, the following conclusions can be drawn.

The study of the substantive essence of FSE and IDE allowed concluding that the FSE is a certain reflection of the innovative development potential. At the same time, the FSE can be the goal and result of IDE, which, in turn, can become a source of additional threats that violate the state of the FSE.

Thus, the research results confirmed the hypothesis that the relationship between the prevention of threats to FSE and IDE has a dual character, where both phenomena act as the goal of the enterprise and the means to achieve it.

Such an interrelation between the categories and phenomena of the FSE and its innovative development necessitates an integrated approach to their management, based on their consideration as two inextricably linked and mutually influencing levers of management efficiency.

At the methodological level, this, in turn, requires further synergetic development of the theories of IDE and FSE management, as well as allocation based on their integration of financial security of IDE, as a separate research subject and the object of managerial decision-making, which combines both the prerequisite (potential) of innovative development and its result.

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