This study identifies the impact of systemic risks on the company's strategic development prospects through attracting investments and ensuring their insurance protection. The company's strategic development model predetermines the level of its investment activity at various stages of the life cycle. This is important because there is an urgent need for the Ukrainian economy to attract foreign investment for the post-war reconstruction of the country. But there are objective difficulties associated with the complication of actualizing the investment position of enterprises in the leading sectors of the economy, taking into account the challenges and threats caused by the military aggression of the Russian Federation. Conditions of entropy, which indicate unpredictability and variability in the business environment, expose enterprises to great risks. It was determined that the investment position of the business entity should correlate with the strategic model of its development and represent a balanced mechanism. This has made it possible to reasonably systematize the risk of investment activities and approaches to their management. Statistical analysis became the basis for evaluating the dynamics of direct and capital investments in the leading sectors of the Ukrainian economy. The results gave grounds for asserting a significant deterioration of the investment climate in Ukraine as a result of the war. The level of direct and capital investments is low. We focused attention on the possibility of flexible adjustment of strategic development plans to unforeseen risks. The proposed recommendations, unlike existing ones, consist of a combination of state and market levers to stimulate investments in the economy of Ukraine. Existing military risks restrain the investment activity of stakeholders. Therefore, the conditions for the practical implementation of the mechanism of distribution and reduction of risks are the formation of insurance protection of investments for investors

Keywords: development model, management strategy, investment position, systemic risks, insurance protection of investors' investments

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REVEALING THE INFLUENCE OF SYSTEMIC RISKS IN THE DEVELOPMENT OF ENTERPRISES ON UPDATING THEIR INVESTMENT POSITION UNDER ENTROPY CONDITIONS

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1. Introduction

The modern position of the enterprise on the market, the intensity and nature of the competitive struggle, the purposefulness of measures to increase the efficiency of business processes and the competitiveness of products determine the prospects for the strategic development of a certain economic entity. These prospects may differ significantly under ordinary circumstances and under conditions of uncertainty.

Under the conditions of rapid and unpredictable changes in the external environment, errors in the company's strategy have a significant impact on the results of its economic activity as a whole, and the performance separately for operational, financial, and investment activities.

No economic entity under conditions of entropy is able to be in a state of equilibrium for a long time due to the variability of the external environment. If the enterprise does not develop or has ineffective management, then the threat of

losing market positions and, as a result, bankruptcy becomes real. The vector of development is determined not only by the operational strategy but also by the company's financial policy and investment position.

It is known that any tracking system that does not have direct interaction with the environment gradually becomes chaotic (unordered, disorganized). Open business management systems are also prone to such a tendency if there is no skillful management to restrain negative processes under the conditions of a rapidly changing external environment. That is why, for the effective implementation of management processes, the management of a business entity needs information not only about current activities but also about certain resource opportunities and development potential, taking into account the threats and challenges of today.

Therefore, it is a relevant task to carry out studies on determining the influence of systemic risks of enterprise development on the actualization of their investment position under conditions of entropy and the construction of a model for balancing the interests of the insurer, the insured, and the investor in the process of insuring investment risks.

2. Literature review and problem statement

In work [1] investment strategy is defined as an integral part of strategic planning. It is emphasized that it includes the following directions: risk management; program-target planning and drawing up capital budgets; strategic analysis; strategic management. It is noted that the company's strategic development model predetermines the level of its investment activity at various stages of the life cycle. Making strategic investment decisions is the result of consideration of alternative ways of achieving a strategic goal by choosing the most effective of them from the point of view of practical implementation. But the author of the study does not propose the practical implementation of the identified directions on the example of an enterprise of a specific industry in order to assess the level of complexity and specificity of implementation in field conditions. The reason for this may be objective difficulties associated with obtaining relevant information.

In work [2], the research is directed to the problems of the functioning of enterprises with an emphasis on the fact that for modern business entities, the uncertainty and riskiness of any innovations are characteristic. The researchers note that the tool for overcoming entropy under such conditions is strategic planning, which must be flexible and mobile, subject to correction due to data updates and rapid changes in the external environment.

Work [3] also states that the management of a business entity is closely related to planning. It is emphasized that the company's resources are always limited, accordingly, their creation, distribution and use can be managed through the formation of tactical and strategic plans. The author's position is interesting in that under modern conditions planning should ensure the production of competitive products with optimal use of all resources, i.e., guarantee the flexible development of the enterprise in the future. At the same time, it is substantiated that financial planning is the basis for managing types of activities (operational, financial, investment), material flows, financial relationships with counterparties. The author suggests that the financial service implement new tools and systems that allow prompt response to all changes in external and internal factors. But what exactly these tools and systems should be was left out of the researcher's attention and was not specified. This may be due to limitations in the scope of the study.

In work [4] it is emphasized that due to a significant number of risks and uncertainty, business entities are forced to adapt to changing conditions. The authors emphasize the expediency of the transition from strategic planning to an iterative approach, according to which plans are adjusted as updated data is received. The authors also suggest moving from comprehensive to diversified planning, which will increase responsibility for decisions made at each level of management. This especially applies to investment decisions. A diversified approach is fully justified in terms of entropy. But in the study, questions regarding approaches to transition from comprehensive to diversified planning remained unresolved.

The author of work [5] noted that the attraction of investments in the economy of Ukraine and its post-war recovery is possible under the conditions of creating a system of insurance of military and political risks. The success of attracting foreign investment depends on the optimal combination of state and market levers. In work [6], the trends of foreign investments in the post-war period are defined in such fields as: energy, military-tech, cyber security, construction, retail, infrastructure, health care. But in studies [5, 6], the questions regarding the mechanisms of attracting foreign investments remained unresolved, which may be associated with significant costs in terms of conducting research in certain industries, which makes the relevant studies impractical.

The authors of work [7] note that the use of strategic planning can significantly improve performance. But in the works cited above, issues related to the development of a mechanism for the implementation of strategic planning at enterprises of a certain industry remained unresolved. This may be due to the difficulties of obtaining the necessary information or the inability to use it in free access.

The authors of paper [8] consider the classic risk model with liquid reserves and proportional investments, and also investigate the expected total discounted dividend. The integral differential equations of the expected total discounted dividend satisfying certain boundary conditions were derived. But the protection of investors' investments remains outside the attention of researchers, which may be related to certain difficulties in obtaining clear solutions to the equations of the proposed model.

Work [9] investigates the Gerber-Shiu function for the insurance surplus process with additional investments according to the Bachelier model. The Gerber-Shiu function allows one to study the moments in the decay time when the excess is negative for the first time. They provide an exact solution for the probability of bankruptcy if the sum of claims follows an exponential distribution. In the general case of the distribution, a numerical method of the Gerber-Shiu function is proposed using a finite differential method based on an integrated-differential equation. But the protection of investors and the balancing of the interests of all participants in the process were neglected.

Strategic (long-term) decisions are primarily related to investment decisions, i.e., decisions about current expenses for the purpose of receiving income in the future, for example, decisions about capital investments, financial leases, financial investments, etc.

So, summarizing the above studies, we can conclude that the advantages of strategic planning are:

– increasing the company's ability to overcome changes;

– improving the coordination of the business entity's activities and minimizing irrational actions to overcome unexpected and unexpected changes;

– ensuring effective diversified distribution of resources;

– promotion of a holistic, integrated approach to the enterprise as a market entity and its environment;

– distribution of responsibility not only by types and areas of activity, but also by current and future activities.

In general, the strategy of any enterprise is a set of certain policies, positions, procedures, and business approaches to ensure the long-term success of this enterprise within a certain market segment. The management strategy consists in choosing and justifying the policy of attracting and effectively deploying resources, primarily financial.

At the same time, not the least role is played by the investment position of the enterprise, which can be represented by a set of assets that the enterprise owns in order to enable its operational activities and receive income in the future. Such assets include equipment, real estate, financial instruments (for example, stocks, bonds), intellectual property, etc. An investment position may also reflect the company's obligations, such as loans, or other financial obligations related to the acquisition of these assets. Valuation and management of the investment position are important aspects of the company's financial management. The investment position of the business entity should correlate with the strategic model of its development and represent a balanced mechanism that combines the company's various investment solutions. Each economic entity is simultaneously the initiator of the investment of funds and the object of external investments. Therefore, methods for choosing tools for control and management of commercial and non-commercial risks, which can be internal and external to the business entity, remain an unsolved part of the problem.

The key to the success of any enterprise within a certain market segment under the conditions of changes in the external environment is a correctly chosen strategy and an effective control system for its implementation. Understanding the strategy should begin with defining the purpose and long-term directions of the enterprise, which determine its mission.

If the economic entity has the opportunity to attract financial resources from various sources, this allows it to maneuver the structure of these resources relatively freely, choosing effective combinations of them.

However, the volume and structure of financial resources of any business entity are influenced by the following factors:

– regulatory and legal field within which the company operates;

– ownership;

– organizational and economic properties and branch affiliation;

– market conditions;

– internal financial and investment policy, etc.

Of course, the strategic goals of enterprises differ in peacetime and in wartime. Despite all the difficulties that accompany Ukrainian business now, it is important to focus on the post-war recovery of the country. It will not be possible to do this on our own, so investments are needed: from the state, the private sector, and foreign stakeholders.

Therefore, Ukrainian business should already now adjust the strategic model of its development, relying on the operational strategy, financial capabilities, and investment position.

3. The aim and objectives of the study

The purpose of our study is to assess the influence of systemic risks of the development of enterprises in the leading sectors of the economy on the actualization of their investment position under conditions of entropy. This will enable leading enterprises in the industry to adjust the strategic model of their development based on operational strategy, financial capabilities, and investment position.

To achieve the goal, the following tasks were defined:

– to analyze the dynamics of direct foreign investments in the economy of Ukraine;

– to systematize risks by types of enterprise activities from the point of view of influence on its investment activities;

– to build a model of balancing the interests of the insurer, the insured, and the investor in the process of insurance of investment risks;

– to investigate legislative innovations regarding the insurance of investments in Ukraine against war risks.

4. The study materials and methods

The object of our study is the investment position of the business entity and its coordination with the strategic model of the enterprise's development.

Investment activity is inevitably associated with commercial and non-commercial risks, for which, as a rule, there is no sufficient number of observations to objectively assess the probability of the occurrence of a certain event.

The ambiguity of the consequences of the occurrence of risk events creates difficulties for the quantitative display of this phenomenon. The peculiarity of investment activity is that the level of risks associated with it is very significant. The investment decision requires not only careful planning, but also constant tracking of changes in various factors and forecasting their consequences for the investment object.

The study of the relationship between the investment position of the enterprise, possible risks and insurance protection tools was carried out using the methods of theoretical generalization, analysis of statistical data, comparison and logical-structural modeling.

The dynamics of direct investments and capital investments in the leading sectors of the economy of Ukraine were analyzed on the basis of data from the Ministry of Economy of Ukraine, the State Statistical Service of Ukraine, the National Bank of Ukraine, research materials carried out by the Internet resources GMK Center, InVenture Investment Portal.

5. Results of investigating the process of enterprise risk insurance in the aspect of actualizing their investment position under conditions of entropy

5. 1. Dynamics of capital investments in the leading industries of Ukraine

The country's economic development is ensured by investments at the level of 20–30 % of GDP, which is considered an indicator of the country's investment security. The level of investment intensity in relation to GDP in Ukraine was above 20 % only for five years (2004–2008). After the

global financial crisis of 2008–2009, Ukraine did not manage to ensure an investment level of at least about 20 % [10].

Statistical data show that the leading domain of economic activity in terms of the volume of foreign direct investment (FDI) in Ukraine during 2020–2023 is industry. As of the end of 2023, the accumulated volume of FDI amounted to USD 54.26 billion (Table 1).

Table 1

Volumes of direct foreign investments in the Ukrainian economy and industry

Indicator	2020	2021	2022	2023
The volume of direct foreign investments in the economy of Ukraine, USD million	52,091	65,746	50,987	54,261
Directed to industrial enterprises, %	40.04	43.7	41.9	*

*Note: * there are no data at the time of publication of the paper.*
Source: [11].

According to the annual statistics from NBU on foreign direct investment (FDI), 75 % of foreign capital in the economy of Ukraine was reinvestment of income received by a foreign investor in Ukraine [11, 12].

The main investor countries during 2021–2022 are given in Table 2.

The dynamics of capital investments in the leading industries of Ukraine during 2020–2022 (Table 3, Fig. 1) reflect their critically low level in 2022 compared to 2021.

The volume of capital investments in agriculture, forestry, and fisheries in 2022 amounted to UAH 51,439 million, which is 35.99 % less compared to 2021. Under the conditions of post-war recovery, it is necessary to ensure diversification of the development of agricultural production on the basis of increased capitalization and investment attractiveness of agricultural enterprises. This requires the formation of market institutions that will provide for the improvement of the efficiency of resources used in agriculture. There is also a need to strengthen the country's food security, develop multi-productivity, increase the export of goods with greater added value, and ensure comfortable living conditions in the countryside.

In 2022, the leading sectors of economic activity, in terms of the volume of capital investments, were: industry – 30.78 %, agriculture, forestry, and fishing – 12.56 %, transport, warehousing, postal and courier activities – 12.09 %.

Table 2

Investor countries in 2021–2022, %

Investor country	2021	2022
Cyprus	31.7	33.1
Netherlands	21.6	19.5
Switzerland	5.8	5.1
United Kingdom	4.6	4.8
Germany	4.6	4.97
Austria	3.0	3.2
Luxembourg	2.4	2.5
France	2.0	2.2

Source: [13].

Due to the COVID-19 pandemic, during 2020, Ukrainian metallurgical companies reduced their capital investments by 52.6 % compared to 2019 [11]. According to the results of 2021, metallurgical companies of Ukraine increased their capital investments by 48.3 % compared to 2020 – up to UAH 25.86 billion. Capital investments in the field of production of cast iron, steel, and ferroalloys according to the results of 2021 amounted to UAH 20.9 billion. This is 31.6 % more than in 2020. This sector was the main investor in the development of the Ukrainian MMC in 2021 – it accounted for 80.8 % of the total capital investment in the industry Table 4, Fig. 2) [15].

Table 3

Capital investments in the leading industries of Ukraine, UAH billion

Indicator	2020	2021	2022	Deviation		
				2021/2020	2022/2021	2022/2020
USD exchange rate on December 31, UAH/USD	28.27	27.21	40.8	–1.06	13.59	12.53
Total capital investment	508.217	673.899	409.66	165.682	–264.239	–98.557
Capital investment in industry	180.537	242.922	126.113	62.385	–116.809	–54.424
Capital investments in the mining industry	21.88	27.3	10	5.42	–17.3	–11.88
Capital investments in the sector "Metallurgical production and production of finished metal products, except for machines and equipment"	18.8	25.86	7.93	7.06	–17.93	–10.87
Capital investments in the production of cast iron, steel, and ferroalloys	15.88	20.9	5.97	5.02	–14.93	–9.91
Capital investment in the production of pipes, hollow profiles and steel fittings	0.4485	2.96	0.9066	2.5115	–2.0534	0.4581
Capital investments in the production of other products of primary steel processing	0.30283	0.62079	0.38739	0.31796	–0.2334	0.08456
Capital investments in the production of precious and other non-ferrous metals	0.63177	1.05	0.4156	0.41823	–0.6344	–0.21617
Capital investment in metal casting	0.19955	0.315689	0.2507	0.116139	–0.06499	0.05115
Capital investment in agriculture, forestry, and fisheries	50.68	69.95	51.439	19.27	–18.511	0.759
Capital investments in transport, warehousing, postal and courier activities	34.885	43.945	49.533	9.06	5.588	14.648
Capital investments in railroad transport	12.635	27.026	12.5	14.391	–14.526	–0.135

Note: [14].

Due to the full-scale invasion of the Russian Federation, according to the results of 2022, metallurgical enterprises reduced capital investments by 67.8 % compared to 2021 – to 7.93 billion hryvnias from 24.65 billion hryvnias. Capital investments in the production of iron, steel, and ferroalloys amounted to UAH 5.97 billion at the end of the year. This is 69.9 % less than in 2021. This sector was the main investor in the development of Ukrainian MMC in 2022 – it accounted for more than 75 % of the total capital investment in the industry [15].

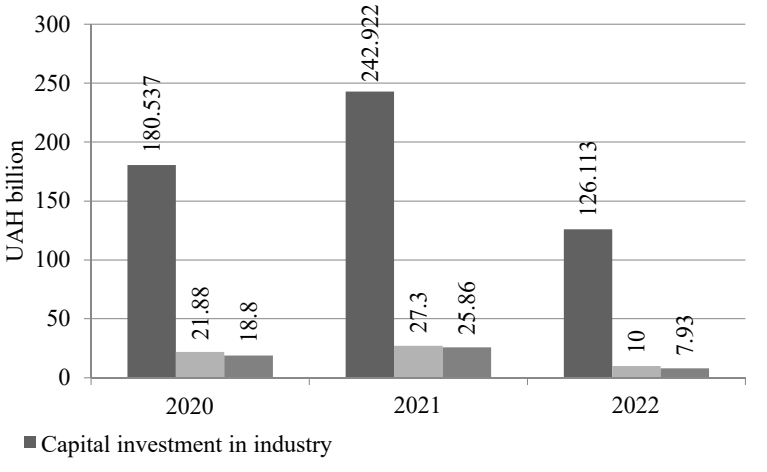

Fig. 1. Dynamics of capital investments of Ukrainian metallurgical companies

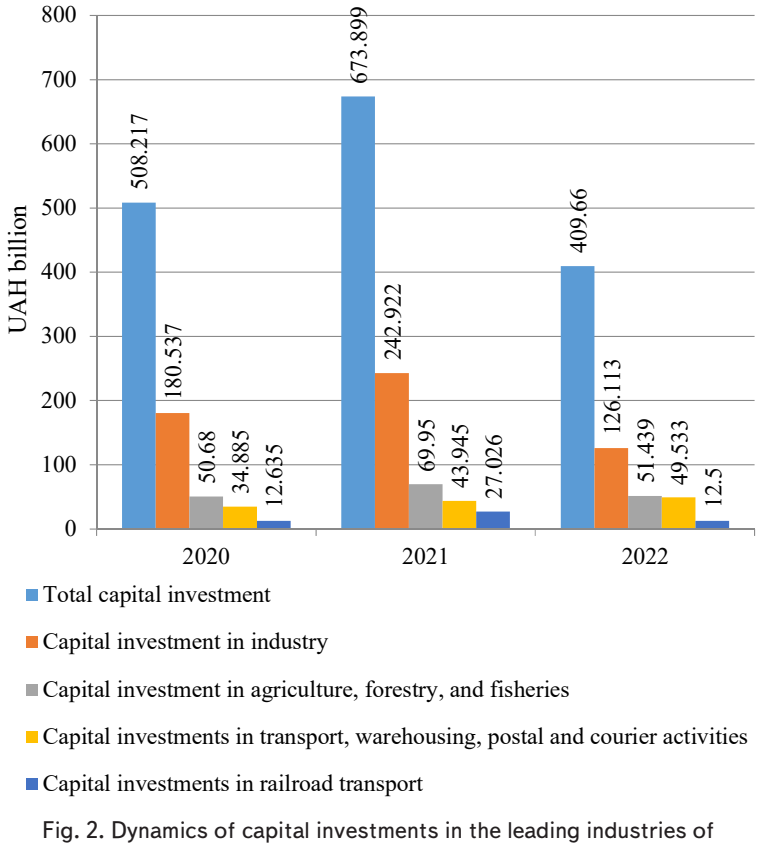

Fig. 2. Dynamics of capital investments in the leading industries of Ukraine for 2020–2022

The dynamics of capital investments in the largest metallurgical companies of the mining and metallurgical complex of Ukraine in 2022 were as follows: "Metinvest" – USD 354 million (–72.3 %); Ferrexpo – USD 161 million (–55.4 %); ArcelorMittal – USD 112.8 million (–63.6 %); "Interpipe" – USD 21 million (–66.7 %).

Thus, the data in Table 3 and Fig. 1 clearly demonstrate a significant decrease in the specific weight of capital investments in metallurgical production from the total volume of capital investments in the industry of Ukraine from 11.59 % in 2020 to 9.91 % in 2021 and to 4.38 % in 2022.

Table 4

Specific weight of the development of capital investments by the industry in the total amount of capital investments by types of economic activity

Branch	2020	2021	2022
Capital investment in industry	35.52	36.05	30.78
Capital investments in agriculture, forestry, and agriculture	9.97	10.38	12.56
Capital investments in transport, warehousing, postal and courier activities	6.86	6.52	12.09
Capital investments in railroad transport	2.49	4.01	3.05

5. 2. Composition and classification of risks that have a direct impact on his investment activity

We have accumulated, systematized in a certain way, and summarized a significant amount of data on the essence, classification, and risk management of the enterprise [6, 16–19].

The vast majority of enterprise risk classifications have a fairly complex hierarchical structure, the components of which may change depending on the specific needs and type of enterprise activity. And even enterprises in the same industry may have slightly different groups of risks affecting their activities.

Fig. 3 proposes the composition and classification of risks by types of enterprise activities that have a direct impact on its investment activities.

Risks by types of enterprise activities that directly affect its investment activities are divided into three groups:

– risks of the enterprise's operational activity (in particular, management risk, operational process risk, technology and information risk, resource and supply risk, external environment risks);

– risks of investment activity, which can be significantly influenced by the risks of operational activity, in addition to them, such risks include financial, political, social, environmental and market risks;

– risks of the company's financial activity (in particular, reputation, credit, liquidity, market risk).

The risks of the investment and financial activities of the enterprise have a mutual influence, and the market risk is common to these types

of enterprise activities. Thus, the risks of the enterprise's investment activity have their own specific composition, and in addition, they can absorb in full or partially, depending on the situation, the risks of operational and financial activities.

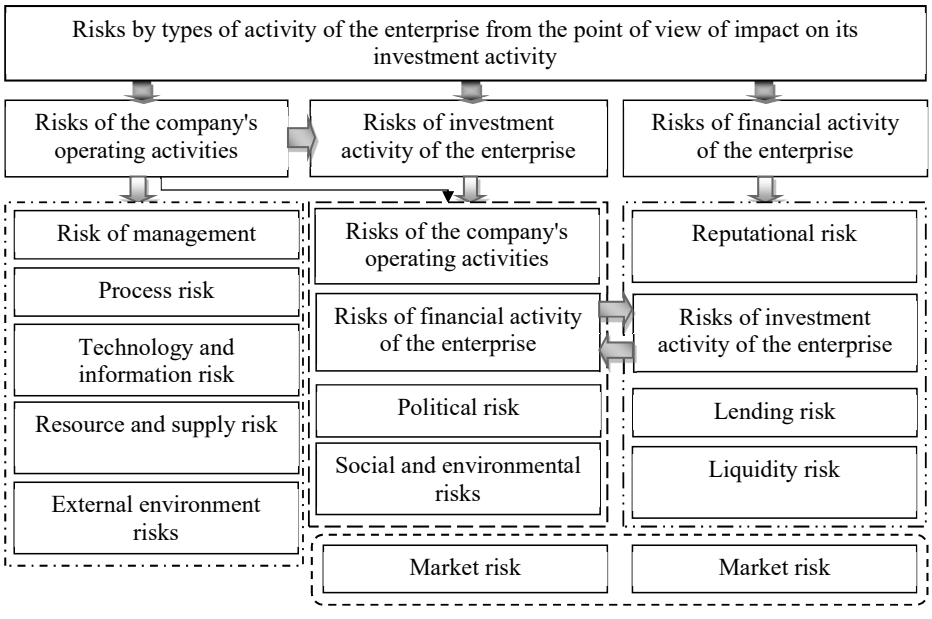

Fig. 3. The composition and classification of risks that have a direct impact on his investment activities

The authors of paper [17] consider economic, social, financial, managerial, environmental, and criminal risks to be the components of investment risk in relation to a certain enterprise. Investment risk involves the possibility of devaluation of investments and loss of investors' income due to the uncertainty of the actions of state authorities, errors in corporate management and unforeseen situations that do not depend on the management of the company and state authorities. All of the above justifies the need for comprehensive risk management.

Enterprise risk management is characterized as a systematic approach to managing all types of risks inherent in a particular enterprise. Such management is focused on identification, assessment, development of measures (avoidance, reduction, or acceptance of risks), monitoring and integration into the general management process. A systematic approach to risk management allows enterprises to gain a holistic view and effectively manage risks, contributing to ensuring sustainable development and achieving strategic goals.

Methods and tools for managing enterprise risks, in particular investment risks, vary depending on the size of the enterprise, its industry, and specific needs.

Newly established enterprises need significant long-term investments to build their own production capacity. Under such conditions, the lending risk is quite high, which explains the objective need to insure loans for investment vehicles. In this case, the object of insurance will be purchased equipment and facilities, engineering and communication networks, other infrastructure that was built, assembled, implemented during the implementation of the investment project. Such projects are usually characterized by innovativeness and riskiness. Classically, investment activity is aimed at obtaining income, which can also be the object of insurance. At the same time, insurers must provide insurance for the risk of non-return of funds invested by a third party in a certain project. The form of investment, such as direct financial investments or their commodity equivalents (for example, leasing) for the needs of insurance in this case does not matter.

Under conditions of entropy, the properties characteristic of other industries and sectors of activity become relevant for managing the strategic development of companies. Approaches commonly used for planning (forecasting) expenses and cash receipts can be interpreted to the investment position of the business entity. Thus, in the banking sector, during the preparation of a financial plan, the rolling financial forecasting tool, which works on the principle of revolving (sliding), is often used. The essence of planning is as follows. After the end of the first month of the planning period (which is usually 6, 12, or 18 months), the planning of cash receipts and expenses for the 7^{th}, 13^{th}, or 19^{th} month, respectively, begins.

The characteristic features of rolling forecasting are usually:

– representation of the development of events in dynamics through constant updating and addition of the information base;

– operation with a small number of indicators, which, in turn, should be decisive in the activity of the business entity;

– constant review of operational and current tasks (in the case of an investment position), speed of response to changes and challenges;

– "short–sightedness" – i.e., optional alignment with the strategic goals of the business entity.

Under conditions of uncertainty, the activities of companies are quite dynamic. Market changes require revision of tactical and operational goals, planning of investment policy tasks according to the principle of revolving. This will make it possible to focus on such business segments and centers of investment, which are currently the most significant for a particular business entity, or for which the greatest threats are identified.

5. 3. Model of balancing the interests of the insurer, the insured, and the investor in the process of insurance of investment risks

Reducing the impact of risks on the company's activities, including investment, can be achieved with the help of various strategies and measures, not least of which is insurance [20].

Investment insurance is a special type of insurance that is designed to protect investors against possible financial losses related to their investments. This type of insurance can be useful for investors in various fields, including financial markets, real estate, startups, and others [8, 9].

Investment insurance can be represented by the following set of services:

1. Insurance of a portfolio of shares or bonds. This type of insurance services can protect investors from losses in the value of their investments due to the instability of the situation in the financial markets.

2. Insurance of infrastructure and construction projects. In large projects, civil and industrial construction, namely the construction of roads, bridges or energy facilities, investors can take out insurance policies to protect their investments against the risks of delays, changes in the technical project or other negative events.

3. Insurance of startups and new enterprises. Investing in startups, investors can take out insurance policies that protect their investments against the risks of unsuccessful implementation of innovations.

4. Insurance of investors' subscription rights. This type of insurance protects investors against the risk of losing their rights to invested shares or bonds in the event of company bankruptcy or unfair actions by the corporation.

Insurance of investment activities as a type of property insurance (capital investments) and insurance of credit, currency, market risks (financial investments) is a quite popular product on the market of insurance services.

In order to balance the interests of the insurer, the insured, and the investor in the process of insurance of investment risks, a model can be proposed that makes it possible to determine the recommended sum insured depending on the net present value of the project, the risks of the project, and the basic sum insured:

$$RIS=f(NPV; R; S_{bas}),$$

where RIS is the recommended sum insured;

NPV – net present value of the project;

R – project risks;

S_{bas} – the basic insurance amount.

The insured sum may depend on the NPV of the project as follows:

1) NPV is used to estimate the cost of the project. The higher the NPV, the higher the cost of the project, which will increase the insurance amount required to cover investment risks;

2) NPV takes into account expected cash flows and risks associated with the project. Projects with a high NPV usually have more predictable cash flows and lower risks, which can affect the reduction of the insurance premium, but at the same time will not necessarily lead to a reduction of the insurance amount (which is potentially an interest of the investor);

3) the insurance amount must cover the initial investment and expected cash flows. If the NPV is high, then this indicates a high profitability potential of the project, but this can be the result of various factors, and accordingly the sum insured should also be higher to protect this investment.

The impact of the net present value (NPV) on the sum insured can be described mathematically by establishing the relationship between the NPV of the project and the sum insured that covers the risks associated with this project. To do this, it is necessary to consider how changes in NPV affect the need for insurance. NPV is calculated by the following formula:

$$NPV=\sum_{t=1}^{T}\frac{CF_t}{(1+r)^t}-I_0, \quad (1)$$

where NPV is the net present value of the project;

CF_t – net cash flow in the period;

r is the discount rate for one period (usually a year);

T is the number of the last researched period (investment horizon);

I_0 is the amount of initial costs.

In the proposed model, an assumption is made that the insurance amount depends on the NPV since a higher level of NPV indicates a higher project cost and, accordingly, a larger amount of investments that need to be covered. This made it possible to reveal a linear relationship between the recommended insurance amount and NPV:

$$RIS=k*NPV+s, \quad (2)$$

where k is a coefficient reflecting the level of risk or insurance requirements depending on NPV;

s is the basic insurance amount that covers the minimum risks of the project.

The integrated model will look like this:

$$RIS=k*\sum_{t=1}^{T}\frac{CF_t}{(1+r)^t}-I_0+s. \quad (3)$$

The coefficient k determines how sensitive the sum insured is to changes in NPV. A high value of k indicates that even small changes in NPV will significantly affect the level of sum insured.

The constant s represents the basic amount of insurance coverage, which is independent of NPV and ensures the minimum coverage of investment risks.

Thus, this model shows how a change in a project's net present value (NPV) affects the amount of insurance required to cover project-related risks. The larger the NPV, the larger the insurance amount may be necessary to adequately cover the risks associated with the project.

However, the conditions of martial law require additional guarantees for investors, in particular, the introduction of an insurance mechanism against military and political risks.

5. 4. Legislative innovations regarding the insurance of investments in Ukraine against war risks

Based on the accumulated experience, it was concluded that the provision of insurance of investment activity under war conditions is carried out with the support of special institutions. They are divided into national – insurance agencies that attract state funds and provide guarantees to investors within the country, and international.

The most influential international organizations related to investment insurance are:

– Multilateral Investment Guarantee Agency (MIGA);
– the State Export Credit Agency of Japan (NEXI);
– State Export Credit Agency of Italy (SACE);
– UK export credit guarantee department (ECGD);
– Belgian Export Credit Agency (BECA).

They are engaged in guaranteeing and insuring foreign investments and export credits.

Insurance of investments in Ukraine is a relatively new service provided by insurers, and therefore there is a need for clear regulation of the procedure of insurance of investment activities and protection of investors' interests. Regulatory and legal innovations in this matter will improve and speed up investments in the country.

Investments are made on terms of return due to the expected receipt of monetary return on investments (value factor), or to meet certain needs, for example, social without expectation of return (valueless factor). So, when making investments, credit-type financing takes place. Investors, investing in business, need guarantees regarding the possibility of returning their capital. This possibility should

be regulated by law both for domestic investment and for foreign investment.

Possibilities of protecting investors' interests are currently regulated by the Law of Ukraine "On Financial Mechanisms for Stimulating Export Activity", according to which the Export Credit Agency (ECA) was established [15].

The main tasks of EKA are, first of all, to protect Ukrainian exporters from financial, market, currency risks. Investments in the construction of facilities and infrastructure necessary for the development of the processing industry and the export of goods (works, services) of Ukrainian origin are protected by means of insurance and reinsurance. ECA cooperates with international and foreign financial organizations, foreign governments, foreign banks, and export agencies, including for the accumulation of international financial aid, ensuring the growth of exports and the economy of Ukraine, and fulfilling ECA's debt obligations.

In accordance with the amendments made to the Law of Ukraine "On Financial Mechanisms for Stimulating Export Activity", the State Export Credit Agency received the right to insure investments against war risks (the amendments to the law entered into force on January 1, 2024). Previously, such a service in Ukraine could be obtained by foreign companies through the international financial organizations MIGA and DFC. Ukrainian companies did not have such an opportunity. But the war risk insurance mechanism through ECA will be fully operational only after the Government approves by-laws and recapitalization of ECA and search for additional sources of its financing. The criteria for introducing industries (types of activity) into the scope of investment insurance instruments in Ukraine are also subject to revision.

The Multilateral Investment Guarantee Agency (MIGA) is part of the World Bank Group and is the largest provider of political risk insurance services. This type of insurance covers risks associated with political instability, state expropriation and conflicts in countries where private underwriters do not dare to work [16].

The US Development Finance Corporation (DFC) is a government agency that provides financial and technical support to companies doing business in low- and middle-income countries. This assistance is aimed at promoting private sector investment, sustainable development and poverty reduction through financing and partnership initiatives.

DFC focuses on attracting foreign investment in infrastructure development projects, energy, health care, agriculture, and other industries. This organization usually provided support only to American investors [21]. After the signing of the Memorandum of Understanding with the Government of Ukraine regarding the support of attracting investments to Ukraine and promoting the country's economic recovery, Ukrainian companies also received the opportunity to insure their investments against war risks [22].

In today's realities, the support of the leading international financial organizations MIGA and DFC is insufficient. The Ministry of Economy of Ukraine calls on the governments of foreign countries to cooperate in creating a specialized program of military risk insurance for both foreign and domestic entrepreneurs. Appropriate insurance products should be available to a wider range of applicants through refinancing and reinsurance funds with preferential obligations to cover insurers' risks [19].

6. Discussion of results related to investigating the influence of systemic risks of the development of enterprises on the actualization of the investment position

The authors of paper [23] investigated the impact of the Russian-Ukrainian war on the country's economy, emphasizing the need to take into account the experience of other countries in overcoming crisis situations and involving foreign partners in the development of programs to improve the country's economic condition.

Attracting foreign investment to the Ukrainian economy is currently quite problematic, as investors are waiting for the end of the war and the country's recovery plan. The authors of work [24] analyzed the development of investments from and to Ukraine for the period 2012–2021 and came to the conclusion that the investment climate in Ukraine is not comfortable for business. This especially applies to the short- and medium-term perspective. This is due to the lack of practical steps to ensure economic freedom and protect the interests of all participants in business processes with clear, predictable, and impartial business rules.

Work [25] examines the mechanism of capital formation and investment in Ukraine in the context of the processes of market transformation of the economy. The weakness of market financial mechanisms determines the growth of the role of fiscal instruments of accumulation and distribution of funds, as well as the need for external financial assistance for the post-war recovery of the economy and the socio-humanitarian space.

In contrast to the above studies, in this paper the problems addressed in [23–25] have been outlined on the example of leading branches in the economy of Ukraine with the justification of the factors of decrease in the volume of capital investments (Table 3, Fig. 1, 2).

Ukraine has been under martial law for more than two years; civilian housing, critical infrastructure facilities, warehouses and production facilities of enterprises are being destroyed every day. Financing civil construction is an urgent need today. Study [26] considers international grants with an emphasis on sustainable development and private investments as the main sources of investment. Such investments can be attracted through the creation of special investment funds or on the basis of public–private partnerships. Work [27] examines the investment policy of construction enterprises from the point of view of innovation with an emphasis on the post-war recovery of the country. The main problems of financing investments are summarized, and it is proposed to create a favorable investment climate that will guarantee investors the protection of their rights and interests. In contrast to these studies, this paper proposes a specific direction that will help correct the strategic model of the development of enterprises in the leading industries of Ukraine. This direction is based on the operational strategy, financial capabilities, and investment position of the enterprise of the relevant industry.

The authors of paper [5] propose mechanisms for covering losses caused by the action of military risks, in particular:

– insurance programs for political (military) risks from private insurance companies, which could be reinsured at the expense of the state or international partners;

– programs of insurance and reinsurance of investments and loans against military and political risks by the Export Credit Agency;

– trust funds, including international ones, to compensate investors who lost assets or profits in Ukraine due to the influence of political and military risks.

Work [7] substantiates the conceptual approach to improving the risk management process of the enterprise under the conditions of martial law. The proposed approach consists in conducting analytical procedures in three modules: research and identification; assessment and analysis; minimization of risks. Measures aimed at reducing the impact of risk events are internal security measures, diversification of risks, anti-crisis planning, external insurance of certain types of risks.

In contrast to [7, 23–25, 28] and in continuation of the study of problematic issues initiated in the above scientific works, we have improved the classification of risks (Fig. 3), which have a direct impact on the investment activity of a business entity. It is emphasized that investment decisions, as decisions of a strategic nature, are designed for a long period and are usually associated with uncertainty and risk. They concern, first of all, the planning and financing of capital investments and require a detailed analysis of all aspects for making risky decisions regarding future investments.

The authors of paper [29] proposed using a decision-making model for concluding an insurance contract (and finding appropriate values of key conditions/parameters of such a contract) for risk management of investment projects. The main parameters that need to be determined according to the proposed model are the fair value of the insurance premium, the insured sum, and the residual risk. The model has the potential to reasonably find a mutually agreed position between the insurer and the insured when concluding a contract regarding the risk insurance of an investment project. If there is information about training the model on real investment projects, this can be a rather promising area for further scientific investigation.

But in contrast to what was proposed in [29], in this work, to balance the interests of the insurer, the insured, and the investor in the process of insurance of investment risks, model (3) is proposed, which makes it possible to determine the recommended insurance amount depending on the net present value of the project, project risks and basic sum insured.

Our study has a number of limitations. They concern, first of all, the limited sample of enterprises under investigation, as well as the lack of access to complete and up-to-date data. This can affect the accuracy of the analysis. Limitations also apply to possible changes in the economic environment, which cannot always be predicted, and which affect the results of the study. The long duration of data collection and analysis can affect the relevance of the results. The dynamism of entropy conditions complicates the process of analyzing and forecasting the impact of systemic risks on the company's activities.

The disadvantages of the study are the limited sample of enterprises, mainly in the metallurgical industry, which does not give a complete picture. The way to eliminate the shortcoming can be the involvement of enterprises from other industries and regions. Another drawback is that not all factors affecting the investment position of enterprises are taken into account. The direction of elimination can be the inclusion in the analysis of the maximum number of relevant variables, conducting expert surveys. Another disadvantage is that changes under the conditions of uncertainty affect the relevance of the obtained results. Reducing the impact of this shortcoming can be done by regularly updating data, conducting longitudinal studies of the sample companies, taking into account trends and cyclical changes in the economy.

An area to deepen this research may be construction of complex econometric models that would take into account multiple factors of systemic risks and their interactions. In this case, researchers face difficulties of a mathematical nature, in particular, the construction and calibration of complex mathematical models would require significant computing resources. Also, identifying correlations and objective causal relationships between various risk factors is a rather difficult task. Another area of development may be to combine economic analysis with social, political, and environmental factors for a more comprehensive understanding of systemic risks. In this case, there are certain methodological difficulties regarding the choice of appropriate methods of analysis that take into account the specificity of systemic risks and entropy conditions, as well as taking into account the dynamism and instability of economic conditions. Another direction to advance our research is to study the impact of globalization and international economic processes on the systemic risks of enterprises. But in this case, it is difficult to ensure the reliability and validity of experimental data, and long-term observation requires significant resources and time. The direction of development of this research may also be to devise practical recommendations for enterprises regarding the management of systemic risks and the actualization of their investment position. As well as implementation of tools for monitoring and risk management based on the results. But we would like to note that in the first case, the implementation of recommendations in the real practice of enterprises may face organizational limitations. And in the second case, there is a need for constant monitoring and adjustment of the risk management strategy under the conditions of changing economic conditions, which in itself is a rather laborious and costly measure.

7. Conclusions

1. The dynamics of capital investments of the leading industries of Ukraine have been analyzed. It was concluded that the activity of the vast majority of enterprises in Ukraine takes place under conditions of entropy. These conditions indicate unpredictability and variability in the business environment, as a result of which enterprises are faced with a significant number of various types of risks. The management of the economic entity needs objective information to carry out current management, taking into account the risks that arise right here and now.

2. We have proposed our arguments on the composition and classification of risks by types of enterprise activities that have a direct impact on its investment activity. It is justified that the activation of investment activity is possible if there is available and reliable information about stakeholders, projects, and benefits from their implementation. In addition to these factors, the transparency of the system of project verification and monitoring of their results, the information exchange between the participants of investment projects, effective state management tools, and the legally established investment risk insurance mechanism also influence.

Taking into account the geopolitical situation, the variability of the market and the environment of economic entities of all branches of the economy, the multivariate management decisions regarding the implementation of the strategy of further development from the resource, economic, and financial points of view must always be ensured.

3. A model of balancing the interests of the insurer, the insured, and the investor in the process of insurance of investment risks has been proposed, which makes it possible to determine the recommended sum insured depending on the net present value of the project, the risks of the project, and the basic sum insured. Three possible options for the dependence of the insurance amount on the NPV of the project were substantiated.

4. Considering the scale of Ukraine's losses from the war, the multifaceted problems faced by investors, it is expedient to focus the efforts of the state and stakeholders on creating a comprehensive system of mechanisms to support investment activities in Ukraine. This can be implemented by forming an "investment coalition" of partner countries, a certain political agreement on setting it up (with the participation of a significant number of donors). And it can also be implemented through the coordination of an international program of insurance against military risks or the provision of financial guarantees for investment activities in Ukraine. At the national level, an internal mechanism for insurance of military risks and the formation of financial support for such a mechanism should be created.

Conflicts of interest

The authors declare that they have no conflicts of interest in relation to the current study, including financial, personal, authorship, or any other, that could affect the study, as well as the results reported in this paper.

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Data availability

The data will be provided upon reasonable request.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the current work.

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