# Methodological Approach to Strategic Economic Stability of Enterprises in Interaction with the External Environment

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Abstract: The processes of globalisation, which have been rapidly developing since the end of the 20th century, have significantly affected the position of most companies around the world. Each large or even medium-sized company had to develop a mechanism for effective cooperation not only with other companies in the domestic market within one country, but also with other international enterprises. Since the beginning of the 21st century almost every company has more and more counterparties whose productivity depends on the efficiency of interaction with them. The purpose of the study is to investigate the process of building effective relationships between an enterprise and external counterparties, provided that strategic stability is ensured in modern conditions. The leading methods used to investigate this issue are the method of cognitive modelling and reflexive management, which allows performing system analysis and synthesis of control options. This paper proposes a new approach to determining the strategic economic stability of enterprises through their ability to ensure the implementation of their own strategic interests based on a preventive response to threats and the use of opportunities from the external environment by establishing productive partnership with its subjects.

**Keywords:** Company, Cognitive Modelling, Strategic Management, Collaboration, Contractors. **JEL Codes:** P42, L20, L30.

# **1. INTRODUCTION**

The peculiarity of cooperation between enterprises and subjects of the external environment is that such cooperation is multidimensional (investment, financial, foreign trade, innovation, etc. aspects) and is characterised by the mutual influence of factors and their dynamics. It also has both the quantitative and qualitative nature of the parameters of the situation description due to the influence of multidirectional interests of the subjects of interaction (Arefieva, 2021; Azieva et al., 2021). The strategic task of enterprises is to ensure the implementation of their interests related to innovative transformations and stimulating the development of new products for future market needs, the generation of consumer demand, the expansion of sales markets, reduction of the cost of production, etc. This can be ensured by establishing productive partnership cooperation between entities from the external environment and enterprises (Beknazarov et al., 2020; Ketners and Petersone, 2021). Ukrainian enterprises operate in conditions of instability and uncertainty in the external environment, which is constantly increasing due to the impact of the financial and economic crisis caused by external shocks. In addition, the need to integrate social and humanitarian factors into governance practices requires increasing attention. Nowadays, most Ukrainian enterprises choose passive adaptation to the challenges of the external environment (Benchak, 2020; Shahini et al., 2022).

The relevance of the study on this topic is conditioned by the fact that modern Ukrainian enterprises cannot fully compete with relevant international partners. Meanwhile, the world is developing the processes of deepening partnerships in the context of comprehensive processes of globalisation. Increasing the number of mechanisms for identifying potential and existing threats to the functioning of the enterprise, unlocking the potential of individual companies (Konurbayeva et al., 2015; Miethlich et al., 2021), and forming a modern regulatory framework will allow Ukrainian enterprises to reach a new level of development (Spivakovskyy et al., 2021).

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O. Arefieva (2021) proposed a model for monitoring the economic stability of an enterprise, which is based on the assessment of the enterprise in terms of indicators of economic security and investment. T. Kotsko and A. Galuzinska (2021) defines the concept of economic stability of an enterprise as its ability to take into account various environmental factors when planning its activities; to overcome internal and external factors that destabilise the position of the enterprise in the market by effectively using its own resources by improving its economic potential; the ability of the company to quickly return to a state of equilibrium after significant economic fluctuations; the ability to use all available resources efficiently. G. Shvydanenko (2021) suggests that an economically stable company is profitable in the long run. Its main goal is to achieve indicators of economic stability, while effectively using financial and human resources. T. Verguts (2022) investigates decision-making models based on cognitive modelling, and statistical model analysis methods for evaluating the parameters of the model under study.

K. Cernavskis (2020) considers an innovative approach to the financial sustainability of enterprises, based on making timely and effective management decisions. This approach involves the simultaneous use of qualitative and quantitative research methods. These indicators include financial, marketing, innovation, and production components. L. Shemayeva (2020) developed a scientific and methodological approach to managing the economic security of an enterprise in strategic interaction with environmental entities, where she noted that the main principles of forming an effective system of enterprise activity are the possibility of managerial influence on the processes of interaction with the external environment. Existing approaches to determining the economic stability of enterprises focus on the efficiency of resource use and do not allow the probability of the absence of advantages that the enterprise receives from external entities and the fact of inefficient use of its own resources by the enterprise to achieve strategic goals (Mukanov et al., 2018; Kerimkhulle et al., 2021). According to A. Kulinych (2012), overcoming the problematic aspects of implementing strategic goals through the use of advantages from environmental actors is the basis for studying the economic stability of companies in the long term.

The originality of the material consists in the fact that the authors of the study revealed the relationship between the strategic economic stability of the enterprise and ensuring the implementation of its strategic goals based on building high-quality and productive cooperation with partners of the external environment. This approach is particularly relevant in the context of increasing indicators of environmental uncertainty and general instability of the economic situation.

The purpose of the study is to substantiate a methodological approach to the implementation of cognitive modelling of reflexive management in the context of cooperation between enterprises and environmental entities in compliance with the paradigm of economic stability of the enterprise. The goal of the study is the methodological substantiation of the content of the process of relations between the enterprise and its counterparties, development of principles for using the recommended mechanisms for managing the situation in interaction with subjects of the external environment, identification of trends and patterns of building productive interaction of the enterprise with other subjects of economic processes.

# 2. MATERIALS AND METHODS

The methodological approaches used in the study were aimed at ensuring the investigation of strategic economic stability of enterprises by predicting scenarios for the development of certain situations during the interaction of subjects, substantiating scenarios for their interaction through methods of analysis and synthesis, and the methods from specific to general and from general to specific. First, a single object of research and was identified and described. Then the judgment was separated from the abstract definitions of the object and formulated. Methods of analysis and synthesis were also used, which allowed identifying individual elements and links in the phenomenon of cooperation with environmental subjects, and defining their essence. The main methods that were used during the study: the method from general to specific, analysis, synthesis, abstraction, induction and deduction; synthesis of cognitive models of interaction of subjects in a situation; cognitive modelling of reflexive control; hierarchy analysis; decomposition. The advantage of the hierarchy analysis method is a pairwise and sequential comparison of processes with each other, and then their impact on the overall situation. It allows investigating the impact of criteria on the subject of research, and their possible alternatives; to put forward general judgments about the importance of criteria in the study of a particular process.

To solve the problem of decision-making on the study of cooperation with external objects, the authors suggest using a methodological approach that combines the provisions of reflexive management and cognitive modelling. This combined approach eliminates the contradictions that arise when using each method separately. Thus, when using the reflexive control method, the structure and dynamics of the development of diverse scenarios that can be discarded during changes in environmental conditions are not considered. And in cognitive modelling, these possible changes are considered, but possible changes in actions on the part of subjects of economic relations are not considered. During cognitive modelling, a system is formed that can be used to create practical scenarios for the development of the situation. The results are contained in the so-called cognitive map, which shows the degree of influence of characteristics on each other. Using this methodological approach, the authors created a system of interaction of subjects in the form of a complex of fuzzy cognitive maps.

Educational and research materials of Ukrainian and American researchers form the theoretical basis of this study. To facilitate the perception of the research materials made in a foreign language, all materials were translated into English. The statistical data of the concern "Aviation of Ukraine", the "Aviant" aircraft plant, Kharkiv State Aviation Industrial Enterprise, and the "Motor Sich" engine manufacturer were used for the statistical comparison. At the first stage of research, the authors prepared and analysed the theoretical and statistical base and outlined the main issues that need to be substantiated and confirmed in this study. At the second stage, scenarios of reflexive management of the development of the situation in interaction with subjects of the external environment were developed and analysed. At the third stage, conclusions were drawn based on the conducted research, which answered the main questions that were raised earlier.

# **3. RESULTS**

The study considerd the topic on the example of ensuring strategic economic stability of enterprises of the concern "Aviation of Ukraine", the "Aviant" aircraft plant, Kharkiv State Aviation Industrial Enterprise, and the "Motor Sich" engine manufacturer during cooperation with the international aircraft manufacturer "HESA" (Antonov Company in the Domain..., 2022). Structuring of information on the interaction of partner enterprises revealed the basic factors of a set of cognitive models of potential cooperation between them, which provides for the sale of 50 AN-148 aircraft by Ukrainian enterprises to an international aircraft manufacturing company, and the organisation of work on personnel training, production of simulators for the assembly of finished aircraft, etc. The total amount of the agreement is more than USD 1 billion (Table 1). Special attention should be paid to business design. All of the above companies have already set appropriate goals that need to be achieved within the framework of the activities of these enterprises (Yakymenko-Tereshchenko, 2018).

 Table 1. Classification of Factors Influencing the State of Strategic Economic Stability of an Enterprise in Interaction with Environmental Entities.

No.	Factor Type	Factor Name	
1	Target (ex- porting com- panies)	Level of implementation of enterprises' strategic interests	
2		Level of economic security of enterprises	
3		Level of implementation of suppliers' interests	
4		Level of implementation of strategic consumers' interests	
5		Possibility of establishing production alliances	
6		The level of implementation of the economic interests of the state	
7		Economic independence of enterprises:	
8	Managers	Efficiency	
9	(exporting companies)	Availability of resources to improve performance indicators	
10		State of relations with environmental entities	
11		Economic independence of suppliers	
12	Suppliers	Efficiency	
13		Ability to increase production capacity	
14		Degree of interest of component suppliers in cooperation	
15		Level of interaction with the state	
16		Degree of belonging / autonomy of the supplier	

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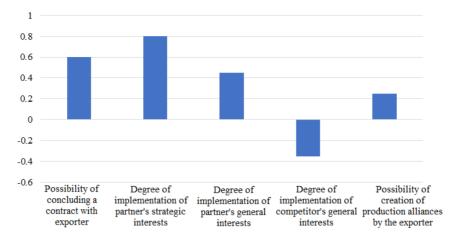
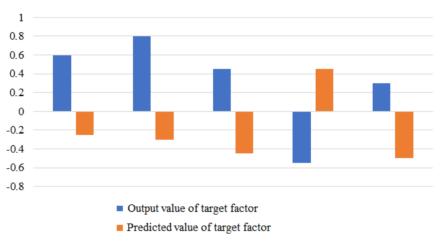


Fig. (1). Initial state of the situation after the signing of a memorandum of cooperation between "HESA" and Ukrainian aircraft manufacturers.

Source: compiled by the authors.



**Fig. (2).** Trends in changes in the values of target factors for Ukrainian enterprises when modelling the forecast of self-development of the situation after leaving the concern of two enterprises and the actions of competitors. *Source: compiled by the authors.* 

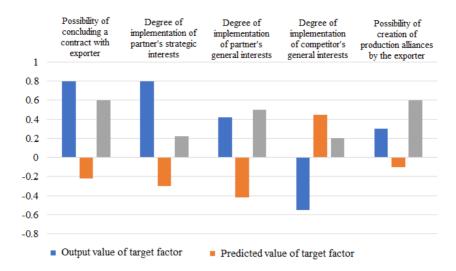
	State of provision of the country with various	
48	production resources, including energy resources	
	and their quality	

Source: compiled by the authors.

The purpose of modelling the situation is to predict its selfdevelopment and the formation of a rational scenario for Ukrainian manufacturers of the AN-148 aircraft to manage its development to ensure the implementation of their own strategic interests by concluding a contract with a international importer, and to study the influence of individual factors on the situation and on individual factors to identify the most significant factors in the situation. Initial state of the situation (target factors of the group of exporting enterprises) regarding the conclusion of contracts after the signing of the joint memorandum between "HESA" aircraft manufacturing company and Ukrainian aircraft manufacturing enterprises shown in Fig. (1).

The situation can be described as follows: a memorandum and lucrative contracts that can be concluded with the other party can significantly increase the level of economic stability of Ukrainian aviation industry enterprises, which depends on the implementation of their strategic interests. Contracts with environmental actors, especially international counterparties, will successfully affect the company's image and create the basis for its effective functioning in the future. However, it should be borne in mind that the fact of signing successful contracts is not enough for a full-fledged effective business operation. Enterprise development is considered an informal process that depends on a large number of different factors. It is also important to choose the area of strategic development of the company, evaluate business processes based on their effectiveness, identify additional priorities for strategic development, and create strategic plans to ensure strategic economic stability in accordance with the existing development plan (Grundey, 2019; Miethlich et al., 2022).

In the future, the signing of contracts was complicated due to the fact that two partners (plant named after Antonov and plant named after Ivchenko) left the concern "Aviation of Ukraine" in court due to the inability to ensure their own development within the framework of a rigid integration structure created on the initiative of the state (Fig. 2). Conse-



**Fig. (3).** Trends in changes in the values of target factors for Ukrainian enterprises when modelling the forecast of self-development of the situation after leaving the concern of two enterprises and the actions of competitors. *Source: compiled by the authors.* 

Table 2. Importance of Control Factors for the Solution C
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No.	Target Factor Name	Factor Value	Trust Level
1	State support for the exporting company within the World Trade Organization requirements	0.509	0.502
2.	Corporatisation of enterprises	0.72	0.55
3	Investment and innovation activity of the exporter	0.754	0.632
4	Efficiency of financial and economic activities of enterprises	0.57	0.36
5	Degree of integration with strategic partners	0.8	0.5
6	Opportunities to create production alliances with competitors	0.5	0.25
7	Competitiveness of goods and high-tech services in comparison with modern world standards	0.490	0.52
8	Level of diversification of export opportunities of the exporter	0.69	0.59
9	Level of information support for the exporter	0.7	0.6
10	Ability to increase production capacity of the exporter	0.42	0.45

Source: compiled by the authors.

quently, the situation regarding contract enforcement capabilities has worsened due to the lack of scientific, technological, and financial capabilities of the concern. In addition, distrust of international partners has increased. The state was unable to establish a dialogue between individual manufacturing enterprises, despite the fact that the state is their absolute owner. Competitors' positions have increased, in particular, due to state support and information support, so the situation is ambiguous (Grundey, 2019; Suchanek and Pawłowska, 2018).

To determine measures for Ukrainian enterprises to maintain their own winning position, it is necessary to develop a scenario for transferring the situation from the current to the target state, that is, to solve the opposite problem using a cognitive model. First of all, it is necessary to determine the desired state of the target vector of the exporting group of enterprises. Considering the interest of an external importer in Ukrainian aircraft, the values of this vector can be modified taking into account the trend of changes in the values of the target factors of the exporter when modelling the possibility of maintaining a winning position for it (Fig. 3).

Analysis of the results of modelling the self-development of the situation in the interaction of partners shows that almost all target factors have changed in an undesirable direction for Ukrainian enterprises. That is, these trends in the development of the situation significantly worsen the state of economic stability of aircraft manufacturing enterprises (Fedai, 2021). The reverse task (managing the development of the situation) has several possible solutions. A rational option, from the standpoint of the enterprise, is chosen using the provisions of the method of multi-criteria hierarchical evaluation of options. One of the possible solutions is presented in Table **2**.

Alternatively, it is advisable to carry out corporatisation of these enterprises, provided that the state retains a controlling stake (value of the factor "corporatisation of enterprises" = 0.72; degree of trust = 0.55). In this case, it is possible to

No.	Target Factor Name	Value with Self-Development of the Situation	Value when Managing	Changes in Target Factors, %
1	Possibility of concluding a contract	-0.22	0.60	82
2	Degree of implementation of the exporter's strategic interests	-0.05	0.252	30
3	Ability to create production alliances	-0.28	0.60	88

 Table 3. Evaluation of the Effectiveness of using the Cognitive Model of Managing the Development of the Situation by Target Factors.

Source: compiled by the authors.

attract investment to ensure the fulfilment of other orders in the absence of a state order (value of the factor "investment and innovation activity" = 0.754; degree of trust = 0.632) (Fedai, 2021).

For the period of transition of enterprises to integration, which can be carried out only on mutually beneficial terms (and not to cover the losses of one enterprise at the expense of the profits of other enterprises), it is advisable to create the following structures: production alliances or other types of partnerships; deepening subcontracting relations with international manufacturers regarding the joint production, providing design and technical services on the basis of competition, where each party is in a winning position (the value of the factor "degree of integration with strategic partners" = 0.8; degree of trust = 0.5; value of the factor "opportunities for creating production alliances with competitors" = 0.5; degree of trust = 0.25; value of the factor "ability to increase the exporter's production capacity" = 0.42; degree of trust = 0.45) (Fedai, 2021).

The study of the most significant factors proved that the most important factors for improving the level of export potential are the factors of state support and state protectionism of the exporter within the requirements of the World Trade Organisation (value of the factor "level of state support for the exporter" = 0.509; degree of trust = 0.502); and the possibility of implementing information support for the exporter (value of the factor "level of information support for the exporter" = 0.7; degree of trust = 0.6) (Fedai, 2021).

Thus, the result of modelling is the determination of control factors and the dynamics of their changes. The analysis of the most influential factors has shown that to ensure the implementation of the strategic interests of a group of exporting enterprises in a situation of interaction with a international consumer (importer), the main factors are: degree of integration with strategic partners, investment and innovation activity (including, due to the corporatisation of enterprises); the level of information support for the exporter. The assessment of the effectiveness of using the proposed model for managing the interaction of an enterprise with environmental entities in the situation under consideration is illustrated in Table **3**.

The effectiveness of using the model consists in changing the values of target factors, from their unsatisfactory values to acceptable values due to the implementation of the current scenario for managing the development of the situation – from 30 to 88%. According to Table 3, if factors are left unchecked, all three key factors will remain negative. The economic efficiency of managing the interaction of enterprises

with environmental entities in this situation increases by increasing the value of the concluded contract with the importer, while reducing the cost of concluding a contract. To do this, the target factors must be presented in a cost form, to consider the cost of concluded contracts, and compare their costs for their conclusion. Changes in the external environment occur very quickly and without effective strategic management, the company will not be able to improve its performance even in the medium term. Adaptive processes are not sufficient to maintain a high level of competitiveness of the enterprise. For effective interaction with environmental entities, the company needs qualitative changes that would ensure the achievement of its strategic goals. It is important to adapt existing resources to possible goals at the corporate, programme, and operational levels.

### 4. DISCUSSION

The need to adapt to changes in the external environment is considered by researchers in the following areas: strategic management in corporations (Nowak, 2021; Baymuratov et al., 2018), the use of the mathematical apparatus of game theory in business strategies (Higgins, 2014; Kerimkulov et al., 2015), the establishment of relationships in strategic alliances (Chen, 2016) and business partnerships (Welborn, 2004; Moldagozhieva et al., 2017), the analysis of problems and advantages of strategic cooperation in business (Szara, 2020), tools for applying strategic flexibility in business (Polishchuk, 2017; Ganiyeva et al., 2015), forecasting global economic dynamics (El-Wassal, 2021). The company's success is based on the principle of successful cooperation since the Neolithic Revolution. It is not surprising that cooperation is one of the crucial success factors for mutually beneficial situations in modern business. Cooperation between companies is possible at different levels and in different constellations, which helps to increase sales, gain market shares, and benefit from joint know-how (Kerimkhulle et al., 2022). However, it is not always possible to ensure the strategic economic stability of one company over another.

R. Welborn (2004) notes that to ensure the success of the partnership between the two companies, it is necessary that all parties choose a single strategic area of development. If one partner seeks to expand the network of their business and increase brand popularity, and the other seeks only to make a profit, then such a partnership will never be successful. K. Szara (2020) determines that the study of cooperation mechanisms can affect the improvement of relations between the two parties, reducing the risks of sudden termination of cooperation, effective use of information that reveals new

ways to solve potential problems, and the ability to quickly and effectively resolve contradictions that arise as a result of cooperation. There are many options for defining the concept of "economic stability". The most complete definition is contained in the research paper by O. Polishchuk (2017). It defines stability as the ability of an economic system (or enterprise) to effectively use its own potential, quickly adapt to changes in the environment in the short and long term, while implementing the goals of all participants in economic activity. According to the researcher, economic stability is a category that allows an economic entity to keep its performance indicators at the same level (or improve them in the most favourable scenarios) without losing its identity, not losing its benefits due to the satisfaction of partners' interests, and consider risks, competition, and other negative environmental influences in its business plan (Makhazhanova et al., 2022).

T. Kotsko and A. Galuzinska (2021) consider the economic stability of companies as an inseparable component with the problems of economic security. This approach is based on the fact that the company chooses the most non-risky path of development. It defines the appropriate indicators by which it tracks indicators and its own potential. It is the development of priority indicators that allows achieving economic stability. The company's management system should overcome these differences and formulate a holistic mechanism for managing the development of the enterprise, considering the previously mentioned priorities, which are based on security and value. By understanding the nature of the economic stability of an enterprise, it is possible to accurately build a flexible and adaptive system in the face of threats and opportunities from the external environment. In such a system, it is very easy to make painless adjustments from changes in any conditions, and at the same time ensure the stability of the enterprise itself (Jakubik et al., 2017; Mingaleva and Aitkazina, 2013). The authors of this study, based on the findings of the above-mentioned specialists, independently determined the factors influencing the state of strategic economic stability of the enterprise in interaction with environmental entities.

Studies on various forms of partnership between companies, enterprises and financial institutions, companies, and consumers are also widely known, in particular, K.A. El-Wassal (2021). The best option is unlimited project or time collaboration. Basically, companies enter into relationships with other companies to ensure their own benefits (including reducing costs). A. Balanovich (2018) presented a two-level model of decision-making, where at the first level a comprehensive strategy for the development of the enterprise is chosen, which necessarily considers the financial risks that the enterprise takes with the existing production potential, an integral indicator of the level of development, the degree of development of the enterprise, at which it is able to adapt to new challenges of the market environment. At the second level, the most profitable and realistic strategy is selected, considering environmental trends and characteristics such as the level of competition, market volume, and product life cycle. The use of this model will help take timely and effective steps that would help strengthen the company's position in the market, including with external partners.

In the study, the researcher used papers investigating the phenomenon of partnership. D. Grundey (2019) suggests that the basis for ensuring and regulating close partnership ties is, first of all, the decision to conclude a long-term partnership agreement, and the exchange of reliable information about their own company, which corresponds to the real state of affairs. The researcher identifies such a concept as "relationship marketing". In this concept, the relationship of one company with another is the basis of their successful activities, which helps them get new customers and partners. The establishment of chains of relationships between participants in trade relations allows companies to increase profit indicators. T. Taran and V. Shemaev (2020) described reflective games based on the theoretical and game interaction of subjects. Decisions are made based on their own indicators (information reflection) and on the basis of decisions made by opponents (strategic reflection). The use of both informational and strategic reflection helps solve most problematic issues in organisational, social, economic areas, etc. V. Ponomarenko (2019) suggests that the strategic economic stability of the enterprise in cooperation with external entities lies in the plane of correct strategic management. This type of management, unlike short-term plans, constantly monitors the organisation's activities and does not allow moving far away from previously set goals. This allows immediately tracking all critical moments at their first appearance

The statistical information base used the following data enterprises of the "Aviation of Ukraine" concern, the Kyiv "Aviant" aircraft plant, the Kharkiv State Aviation Industrial Enterprise and the Zaporizhzhia aircraft engine manufacturer "Motor Sich" in cooperation with the international aircraft manufacturer "HESA". In addition, statistical data were taken by the authors from other research materials as a result of research by their authors. It is important to understand that the problems associated with ensuring the strategic stability of an enterprise are just as important as the problems of ensuring sustainable economic development, economic security, and effective management. The main problem of modern theories of ensuring the sustainability of interaction between enterprises is that recommendations for overcoming problems in one area can lead to problems in another in the future and further worsen the overall condition of the enterprise (Tashpulatov et al., 2018). Notably, the issues of strategic interaction of enterprises with environmental entities require further investigation. Namely: the need to ensure the economic stability of enterprises in the strategic time interval due to the use of opportunities provided by the external environment; determination of the content and features of partnership interaction of enterprises of defence enterprises; substantiation of the possibility of managing partnership interaction of enterprises with counterparties of the external environment on a systematic basis to ensure the implementation of their strategic interests, considering the activity of subjects of the external environment, when developing strategies for economically stable functioning and development of the enterprise.

## 5. CONCLUSIONS

Ensuring the strategic economic stability of enterprises is especially important today, when the external environment of each company is becoming increasingly unstable. Changes in the external environment occur very quickly and without effective cooperation with counterparties, it is impossible to achieve goals and ensure the company's productive activities. The proposed methodological approach to ensuring the strategic economic stability of enterprises by means of interaction with the subjects of the external environment provides for a comprehensive solution of tasks: monitoring the strategic situation using reflexive analysis of its subjects, forecasting the self-development of the situation and its managed development to ensure the implementation of the strategic interests of the enterprise. The results of modelling, scenario forecasts of the development of the situation in the interaction of enterprises - partners of the aviation industry of Ukraine and the international aircraft manufacturing company "HESA" on the sale of aircraft indicate that combining the efforts of the scattered capabilities of enterprises of the Ukrainian aviation industry is crucial. But this association should be flexible and built considering the possibility of coordinating the economic interests of all enterprises. Alternatively, it is advisable to carry out corporatisation of these enterprises, provided that the state retains a controlling stake.

Strong and productive relationships between enterprises are possible only if they are built for a long-term, not short-term period, and when all participants in this cooperation receive permanent benefits. A reflexive and cognitive model was used to identify the basis of strategic economic efficiency. The main target factors used to assess the level of cooperation with environmental entities are: the possibility of concluding a contract, the degree of implementation of the exporter's strategic interests, and the possibility of creating production alliances. The effectiveness of using the model consists in changing the values of target factors, from their unsatisfactory values to acceptable values due to the implementation of the situation development management scenario developed using the model (from 30 to 88%). It is important to build a management system that will immediately respond to any deviations from the existing business plan. However, in modern realities, it is also important for an enterprise to build productive and mutually beneficial relations with environmental entities to analyse its cooperation with other enterprises. It is necessary to check the origin of decision-makers, in a particular, company, and the attitude of the international community to a particular subject of economic relations. The issues under study require further investigation.

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