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1 DEVELOPMENT OF SCIENTIFIC AND TECHNOLOGICAL COOPERATION BETWEEN EU COUNTRIES AND UKRAINE IN THE CONDITIONS OF ITS POST–WAR RECONSTRUCTION

ABSTRACT

In recent years, significant progress has been made in risk management. Moreover, along with risk management, new concepts have been introduced: risk management, risk economics, risk engineering, risk administration and risk production; a new, basic, general and professional criterion for dividing risks (into economic, engineering, administrative and production) has been established; the interpretation of the elements of risk content has been clarified: certainty and uncertainty, in particular, their minimum and maximum values.

However, most scientists consider the idea of the existence of such two forms of them — complete certainty and complete uncertainty — to be erroneous. Eliminating illusory management practices is necessary to increase the effectiveness of organizational decisions. In conditions of complete certainty, managers may mistakenly believe that all processes are predictable, which leads to excessive bureaucratization. In conditions of complete uncertainty, the illusion of control contributes to making impulsive decisions without relying on analytics and scenarios of events. The elimination of such illusions allows to form adaptive strategies and respond more effectively to changes in the external environment. Therefore, this section has proven the absence of complete certainty and complete uncertainty both outside and inside the risk. For the first time, the widespread idea of the existence of complete certainty and complete uncertainty has been refuted.

The results obtained will deepen our understanding of the essence and content of risk, risk management and risk governance in general, and will increase the efficiency of managing enterprises and organizations in the face of risks by eliminating unnecessary activity in the face of non-existent so-called "complete certainty" and "complete uncertainty". Such results will allow to concentrate attention and resources on the real subject of risk management — only on risk.

KEYWORDS

Risk, complete certainty, complete uncertainty, management, illusory management practice.

1.1 THEORETICAL PRINCIPLES OF UNDERSTANDING AND PRACTICE OF APPLYING RISK MANAGEMENT

It is known that the activity of mankind in the conditions of risks has always been in the past, is now, and in the future, post-industrial, entrepreneurial era will only grow. It is necessary to state with pleasure

that to date, knowledge about risks and management in their conditions have achieved significant success, including with the participation of the authors of this article. Thus, the following have been newly defined: the stages of their development, methods of management in the conditions of risks, the essence, the content of risk — as the unity of two basic elements (uncertainty and certainty); the concept of "risk management" has been clarified — as a composition of new concepts "risk economics", "risk engineering", "risk administration"; a new concept of "risk management" was introduced — as a composition of risk management and risk production and as "management under risk conditions" instead of the erroneous one — "risk management" [1, 2]. The need to increase the effectiveness of risk management was also proven, primarily by establishing a new, basic, general and professional criterion for dividing types of risks into economic, engineering, administrative and production. The interpretation of risk as a unity of two main elements: certainty and uncertainty was also clarified. However, the authors believe that among the types of certainty and uncertainty, the idea of the existence of complete certainty and complete uncertainty (inside the risk) is erroneous? Therefore, the very formulation and solution of this problem becomes an exceptionally relevant problem of risk management.

The authors of this section conducted a scrupulous and capacious analysis of a significant number of literary sources on the basic concepts of risk management [3–6]. It shows that there are various interpretations of the concepts of risk, certainty, uncertainty, complete and incomplete certainty, complete and incomplete uncertainty.

But the main result of the analysis is the conclusion that the literature assumes the existence of three different separate phenomena: risks, complete certainty and complete uncertainty. The authors of the article consider the idea of the existence of complete certainty and complete uncertainty (inside the risk) to be a mistake. Let's give a few quotes that clearly illustrate this mistake.

Thus, in [4] it is stated: "Complete uncertainty is a type of uncertainty characterized by close to zero predictability of events. In conditions of complete uncertainty, economic entities are completely unable to predict in any way both the prospects of their own development and the market as a whole... Complete certainty is characterized by a predictability of an event close to 1 and allows economic entities to predict not only their strategy in the market, but also its development trends with a 100 percent probability". But an enterprise is a phenomenon created by man, and therefore there can be neither complete certainty, nor the absence of fluctuations in the magnitude of results, nor can there be complete uncertainty (this follows from the risk principle).

A similar point of view is present in [7–9]. Here the author is sure that "... one can talk about the conditions of certainty, risk, and uncertainty in decision-making". That is, it is also asserted that certainty and uncertainty exist separately, outside of risk. At the same time, it follows from the whole context that here we are also talking about complete certainty and uncertainty.

Analysis of recent research and publications as a whole shows that the most important unresolved component of the problem. In contrast, the authors of this study, based on their personal many years of experience in researching risks as a subject of risk management, or more precisely, as a subject of all risk management as a whole, put forward a hypothesis about the lack of complete certainty and complete uncertainty in general in the phenomena created by mankind.

1.2 RESEARCH METHODOLOGY

To achieve the aim, the following methodological approach will be followed in the study:

— the meaning of the risk principle is revealed;

— the absence of complete certainty and complete uncertainty outside the risk is proven;

— the absence of complete certainty and complete uncertainty within the risk is proven.

When solving the first problem, which was to establish the risk principle, the authors drew attention to the fact that risks are an integral part of any human activity. This is due to the fact that every phenomenon that arises as a result of human activity always carries a certain risk. Risks have accompanied humanity at all times, since the beginning of the development of civilization, and will remain an important component of our existence in the future. Any phenomenon created by humanity cannot exist without risk, and at the same time there is no risk without a phenomenon. In other words, these two concepts are inseparable.

The principle of inseparability of risk and phenomenon emphasizes: if there is a phenomenon, then it is necessarily accompanied by risk. This applies not only to complex technical or innovative processes, but also to everyday actions. For example, the invention of the car brought with it the risks of road accidents, and the development of digital technologies gave rise to the risks of cyber threats. At the same time, if there is no risk, this means that the phenomenon to which this risk is associated also does not exist. This dependence is explained by the fact that risk is not just a random component, but a natural property of any phenomenon that arises as a result of human activity.

Given this inseparability, a logical question arises: how exactly is risk related to the concepts of certainty and uncertainty? It is especially important to explore these relationships in cases of absolute certainty and absolute uncertainty. After all, it is these extremes that are most often used as theoretical concepts for analyzing complex situations. The answer to this question became the basis for solving the second problem.

The second task was to prove that beyond the risk there is neither complete certainty nor complete uncertainty. To do this, the authors relied on the risk principle established during the solution of the first task. According to this principle, if there are risks, then there must be corresponding phenomena. Among these phenomena there may be such extremes as complete certainty and complete uncertainty.

However, let's imagine a situation where there is no risk at all. In this case, there are no corresponding phenomena, since they are always associated with risk. This means that beyond the risk, it is impossible to exist either absolute certainty or absolute uncertainty. This statement is explained by the fact that the phenomena of complete certainty and complete uncertainty are theoretical constructs that exist only in connection with risk. Without risk, these constructs lose their meaning and cannot actually be realized.

This conclusion is important for understanding the nature of risk and its role in shaping human activity. Outside the risk, the world becomes "empty" in terms of certainty or uncertainty, because their presence is possible only in interaction with risk. Therefore, the statement about absolute certainty or absolute uncertainty in a world where there are no risks makes no sense.

Additionally, the authors considered the question of whether phenomena of complete certainty or complete uncertainty can exist in the risk itself. To do this, they turned to the analysis of the content of risk,

which consists of two main elements — certainty and uncertainty. This means that risk by its nature is a simultaneous combination of these two components.

From the content of risk, it follows that if risk exists, then both of its components must necessarily exist: certainty and uncertainty. This conclusion is based on the concept of "content", which means the set of basic elements of the phenomenon. If even one of these elements disappears, the entire structure of risk collapses. Thus, risk is impossible without the interaction of certainty and uncertainty.

The key point is that none of these elements can completely disappear or become absolute. In other words, certainty cannot be reduced to zero, but it cannot completely replace uncertainty either. Similarly, uncertainty cannot fill the entire risk space, but it cannot be completely absent either. This means that it is impossible to achieve a state of absolute certainty or absolute uncertainty in risk itself.

Risk is a complex phenomenon that is inextricably linked to phenomena created by mankind [10]. Its content is determined by the simultaneous presence of certainty and uncertainty, which cannot exist separately. Outside the risk, neither absolute certainty nor absolute uncertainty is possible, and inside the risk they always coexist in a certain balance. These conclusions emphasize the importance of the risk principle as a key tool for understanding complex processes and phenomena.

The principle of inseparability of risk and phenomenon is a fundamental concept that emphasizes that any phenomenon created by man is always accompanied by a certain degree of risk. This dependence is due to the fact that human activity is always associated with uncertainty, and therefore with the potential for adverse or unpredictable consequences. That is why risk cannot be separated from any human project, discovery or process.

For example, the development of transport technologies, such as cars or airplanes, opened up new opportunities for humanity to move quickly, but at the same time brought with it the risks of accidents, technical malfunctions and security problems. A similar situation is observed in the field of information technology: the creation of computer networks has greatly facilitated the exchange of information, but at the same time the threats of cybercrime have arisen [11]. Even such everyday phenomena as housing construction or agricultural activities involve risks — from possible natural disasters to man-made accidents.

Thus, the established principle of the inseparability of risk and phenomenon is of profound importance for understanding the nature of human activity. It emphasizes that no progress or change can be absolutely safe or completely predictable. Humanity is always left to seek a balance between positive development opportunities and managing potential risks that inevitably arise in the process of creating new phenomena.

The proof of the absence of complete certainty and complete uncertainty outside the risk boundary is based on the principle of the inextricable link between phenomena and risks. Outside the risk boundary, where potential threats or opportunities are not considered, it is impossible to speak of absolute predictability or complete chaos. This is explained by the fact that any phenomenon that is not accompanied by risk actually ceases to exist as a real process or event.

Complete certainty implies the existence of an ideal state in which all factors affecting an event or phenomenon are fully known and controlled. However, in the real world, this is not possible, since there are always unknown variables, even in the simplest situation. For example, even in a stable production process,

unforeseen circumstances may arise, such as equipment breakdowns or external economic changes. The absence of risk here becomes a theoretical abstraction that has no practical meaning. Similarly, complete uncertainty means a state of absolute chaos, where there is no predictability or structure. However, in nature and society, there are always certain patterns and regular relationships that exclude complete chaos. Thus, both complete certainty and complete uncertainty outside the limits of risk become absurd concepts.

Within risk, it is also impossible to achieve a state of absolute certainty or absolute uncertainty. This is explained by the nature of risk itself, which includes the simultaneous interaction of two main components — certainty and uncertainty. It follows from the content of risk that these components are its inseparable components.

Certainty within risk means the presence of partial information about the possible outcomes of an event or process, while uncertainty reflects the inability to predict all possible consequences. None of these components can completely disappear or become absolute. If certainty disappears completely, risk as a phenomenon ceases to exist, since any logical basis for forecasts is lost. On the contrary, if uncertainty disappears, risk also disappears, since all outcomes of the event become predictable.

Thus, neither absolute predictability nor complete chaos are possible even within risk. Risk always functions as a balance between a certain share of certainty and a share of uncertainty, which complement each other.

Effective risk management allows to identify, assess and minimize existing risks by developing response strategies and preventing potential losses. An important tool is the construction of risk forecasting models based on data analysis and the implementation of contingency plans to ensure resilience, in particular supply chains.

The financial sustainability of an organization is characterized by the ability to maintain solvency, ensure continuous operations and meet financial obligations even in crisis conditions. In the logistics sector, this includes cost control, inventory optimization, and management of receivables and payables.

Risk management in this context helps to form financial reserves to cover unforeseen costs, maintain flexibility in financial flows and avoid significant losses from logistics failures. For example, the use of insurance mechanisms or hedging currency risks are practices that support the financial sustainability of logistics operations.

The readiness of a logistics system to develop lies in the ability to quickly adapt to market changes, introduce new technologies and management methods. The assessment of such readiness includes an analysis of financial indicators, organizational flexibility and risk management strategy.

Risk management in this context contributes to effective planning of the expansion of logistics capacities, development of scenarios for adaptation to changes and reduction of the probability of failures during the implementation of innovations. In addition, it allows to avoid overspending of resources and to increase the overall efficiency of management, in particular logistics.

The object of the study is to assess the financial stability and readiness of logistics activities in organizations for development. The proposed two-component methodological approach makes it possible to optimize the assessment of the readiness of organizations for development based on determining a sufficient level of investment, on the one hand, and a balanced level of activity costs, on the other. Thus,

for the first component, it is proposed to use an integral indicator of investment adequacy, the calculation method of which is based on combining the dependencies between the volumes of capital investments and other resource parameters of the activities of enterprises (depreciation deductions, long-term loan capital, non-current assets, equity, etc.). The second component reflects the ratio of material and other operating costs to the total income of logistics activities in organizations.

The study was carried out on the example of motor transport enterprises. The proposed methodological approach was tested, which showed low resource capacity of enterprises. The dynamics of the integral indicator of investment adequacy showed that in general for enterprises engaged in road freight transportation, its level is significantly lower than the normative value, which is equal to 3. Its value on average fluctuated at the level of 1.2–1.7, that is, it was in the range of the absence or limited resources for economic development. This indicates the dominance of survival strategies, not development, among motor transport enterprises, and weak state policy, which does not stimulate investment activity in a legal transparent environment.

The results obtained can be used both at the level of individual logistics organizations and organizational networks, and for an aggregated assessment of the industry as a whole. An additional advantage of the developed two-component methodological approach to assessing the state and readiness of an enterprise for development is the possibility of using different components for each component, differentiating their importance in an integrated assessment, and adjusting target ranges.

As a result of the study, several possible strategies for managing the development of logistics activities in organizations were identified, such as a reserve management strategy, an asset diversification strategy, a profit reinvestment strategy, a strategy for optimizing liabilities and obligations, a risk-oriented liquidity management strategy, and an active liquidity management strategy.

1.3 ASSESSMENT OF SUSTAINABILITY AND READINESS OF LOGISTICS ACTIVITIES IN ORGANIZATIONS FOR DEVELOPMENT: PROBLEMS AND SOLUTIONS

The difficult period of adaptation to modern conditions and requirements for the transport sector will accelerate the processes of transition to a new level of competition in the freight transportation market. Digital transformation is accelerating, consumer preferences are changing, new business models are being introduced [1]. In the future, the competitive environment will be determined by technological modernization, in fact, the restart of infrastructure in general, and transport in particular.

Most organizations have weak financial stability. Despite overcoming the ongoing crisis of unprofitability of motor transport enterprises in the freight transportation market, their profitability remains low, which does not allow forming enough capital to finance development [2].

This situation has led to the emergence of economic and social problems: aggravation of the deficit of working capital; low level of competitiveness and attractiveness for foreign investment; lack of effective policies aimed at stimulating the growth of financial resources; insufficient level of financial potential and economic base.

The negative impact of the ongoing processes has significantly increased the requirements for ensuring the sustainability of commodity supply chains, and in this market the processes of logistics optimization, mergers and acquisitions of transport companies have intensified. A growing trend is the development of e-commerce, wh ich stimulates the control of transport and logistics companies at all links of the supply chain — manufacturer, warehouse, sales centers [3–5]. Increasing investments in modern technologies of logistics supply chains is considered as a tool for improving the quality of transport services, reducing operating costs, and reducing environmental impact.

European initiatives on transport development strategies are supported by large-scale financial resources and various financial instruments for the restoration of the transport sector. The budget of the relevant funds for these purposes is estimated at over 1.8 trillion euros. This further emphasizes the conclusions of this study that the success of the transport sector development critically depends on a consistent state incentive policy, supported by the formation of powerful financial funds and instruments [6–8].

The priority innovative direction of the transport industry development is its digitalization. Accordingly, investments in the implementation of digital technologies in the business processes of transport enterprises will become increasingly important to ensure the maintenance of competitive positions in the market. At the same time, there is a wide range of digital technologies and tools, and their application depends on the type and functional area of logistics activities in organizations. In general, two main models of their activity can be distinguished:

1) organizations that provide goods transportation services;

2) organizations that manage a fleet and provide rental or outsourcing services.

For the first type of organizations, the priority areas of investment in digital technologies are digital tools that allow real-time receipt of data on the delivery of goods, possible obstacles and delays, etc. Such technologies are needed for a quick and timely response to possible problems or changes in the needs of service consumers to avoid delays and unplanned expenses.

For organizations of the second type, investments in digital solutions for monitoring the condition of their vehicles, their intended use, location, etc. are a priority. Such investments are necessary both for control and for the ability to meet modern standards of safety and environmental friendliness of the use of road transport.

Scientific research on the topic under study is important because the economic development of organizations cannot be achieved without innovative development. Low efficiency of spending on technological innovations does not provide opportunities for development. Therefore, it is necessary to take into account not only equipment and technology, but also the organization of the production process. The introduction of innovations requires an increase in sources of capital investment, the expansion of which is impossible without the use of state innovation policy instruments: public-private partnership programs, technological development, and preferential taxation [7, 8].

The current task is to develop a methodological approach to assessing the readiness of organizations for development and recommendations for expanding investment opportunities. The results of such studies are needed in practice, because they are determined by the need for organizations to update fixed assets, the need to transition to modern technologies, the introduction of innovative products and the growth of demand for qualitatively new transport services.

1.4 SCIENTOMETRIC ANALYSIS OF EXISTING PUBLICATIONS ON THE DEVELOPMENT OF METHODOLOGICAL APPROACHES TO ASSESSING THE SUSTAINABILITY AND DEVELOPMENT OF ORGANIZATIONS

International experts note that the development of sustainable transport infrastructure will be based on four dimensions of sustainability: environmental (climate change resilience), social (inclusiveness), institutional (technological development) and economic (productivity and flexibility) [9]. According to their estimates, by 2040 the need for investment in transport infrastructure will amount to up to 2 trillion USD. This is considered a "golden era" of transport infrastructure.

Among the main trends that will determine the development of transport in the EU countries for 2021–2024, the following are highlighted [10]:

1) prioritizing the transition to alternative fuels;

2) ensuring competition in the aviation industry;

3) a modal-neutral approach that promotes sustainable transport development;

4) green financing to increase the sustainability of the EU transport sector.

It should be noted that the current action plan for the implementation of the Transport Strategy provides for the development of multimodal transport technologies and infrastructure complexes to ensure interaction between different modes of transport. And, in particular, paragraph 21 of the plan provides for the partial reorientation of road freight transport to rail and inland waterway transport [11].

In general, the trend in the development of intermodal and multimodal transport also determines the priority for road transport enterprises to invest in projects that will allow them to quickly adapt and integrate into such technologies. The objective priority for investing in development is projects to prepare for the transition to renewable fuels through the renewal of the transport fleet and ensuring compliance with new environmental standards.

The complexity and multifaceted nature of economic development determine the presence of a wide range of scientific interpretations and understandings of such development, for the disclosure of which various algorithms and methods of its assessment are developed and applied. Domestic and foreign researchers use various methodological approaches to assess the financial condition of enterprises, their readiness to implement various strategies of economic development. Thus, the author of the work [12], systematizing methodological approaches to enterprise development, distinguishes the following types: innovative, economic, strategic, marketing and competitive. The author concludes that each of the above approaches or their combination has its own advantages for application, but at the same time reflects only a separate specific effect associated with the development of the enterprise. But the effectiveness of their application will depend primarily on the readiness to implement development strategies on an alternative basis and adapt to new operating conditions. This occurs under the influence of internal and external changes, which complicates the process of assessing the readiness of enterprises for development.

Considering the functioning and development of an enterprise through the prism of competitiveness, methodological approaches are developed to assess the level of such competitiveness. Thus, some researchers note that the competitiveness of an enterprise depends on many factors: technical and technological, organizational and managerial, financial and economic, socio-psychological, natural and geograph-

ical, transport, environmental, industry and market. Therefore, competitiveness cannot be measured by a single statistical indicator [13]. Accordingly, the authors' approach to the need to apply different assessment methods, which are systematized according to two criteria: the degree of objectivity/subjectivity and the type of assessment (quantitative and qualitative), is justified. They thus distinguish 4 groups of methods for assessing competitiveness: objective-quantitative (calculated and calculated-graphic), objective-qualitative (models of structural and strategic analysis), subjective-qualitative and subjective-quantitative.

Different methods have their advantages and disadvantages, and accordingly, their application must correspond to the goals and possibilities of their effective use. Difficulties arise due to the fact that some assessment methods require complex algorithms for calculating performance indicators, and hence more costs for their application. Other methods are less complex, but also with a lower probability of accuracy and validity of their results. This complicates the choice of the optimal method.

Often, the development of an enterprise is considered in the context of assessing its potential. The implementation of this approach is based on the application of various methods for assessing such potential, which, in turn, is also considered by its individual types, in particular: innovative, investment, technological, competitive, marketing, labor, etc.

In the work [14], the author singled out the following principles for assessing the potential for economic development of an enterprise:

1) determining the key properties of the enterprise;

2) considering the potential for economic development of an enterprise as a set of its properties;

3) identifying a criterion functional property;

4) identifying the controllable basic properties of both the enterprise and its components;

5) identifying the uncontrollable basic properties of the enterprise and its components;

6) taking into account external environmental factors;

7) organizing the process of searching for reserves for the enterprise's economic development.

Despite the rather broad interpretation of these principles, they show the systematicity and complexity of the enterprise's potential and, accordingly, methodological approaches and tools for its assessment.

The author also emphasizes the need to use three levels of potential assessment indicators: partial, general, generalizing. Partial will characterize the possibilities of improving the basic properties of the enterprise (in particular, consumer properties of products or services). General will characterize key properties (in particular, financial results, sales volumes, etc.). Generalizing will characterize the criterion properties of the enterprise (for example, its market value).

The author's grouping of methods for assessing the potential of economic development of enterprises includes: the use of individual indicators or their combination; quantitative and qualitative assessment; absolute and comparative assessments; different levels of the hierarchy of assessment indicators, etc. Such diversity opens up wide possibilities for finding effective tools and indicators for assessing the current state or potential of the enterprise at the appropriate stage of its development. But the issue of determining the optimal methodology remains unresolved due to the fact that excessive overload can blur the accuracy and validity of the results of their application when making management decisions regarding strategic and tactical tasks of enterprise development.

In the context of assessing the potential of enterprises, traditional methods are to determine the effectiveness and feasibility of investments, investment projects for individual enterprises. In particular, this involves assessing the payback period of investments, the level of net present value, investment profitability, and systematization of risks for the relevant industry or market of goods/services. Undoubtedly, assessing the effectiveness of investments is critically important for the development of an enterprise, but it is advisable to apply it to specific investments, relevant target goods, services, and markets. The problem remains that such methods should be preceded by an integrated assessment of the state and readiness of the enterprise for development. But investments should serve as the basic criterion and indicator for conducting such assessments.

A number of studies are aimed at developing methodological tools for assessing the state and potential of development, which take into account industry specifics and aspects of the functioning of business entities. In particular, such an approach is disclosed in the works: [15] on the development of agricultural enterprises, [16] on the development and livelihoods of food industry enterprises, etc. There is no single methodological approach to assessing the development of motor transport enterprises, so this issue remains relevant.

In general, it should be noted that the development of methodological approaches to assessing various aspects of the activities and development of enterprises is carried out in accordance with the theoretical basis of the issues under study. And, accordingly, the application of existing and new criteria, indicators, characteristics should be adapted to management tasks, the existing information base for the use of such methodological approaches and tools.

Most researchers justify the need to combine different assessment methods that will provide an acceptable level of validity of conclusions and recommendations regarding the analysis of the current and potential state of development of the enterprise, but this issue remains unresolved.

All this allows to argue that it is advisable to conduct a study dedicated to optimizing the assessment of the readiness of enterprises for development based on the development of a two-component methodological approach that takes into account investment adequacy and material costs. This methodological approach determines the logic of monitoring the sustainability of motor transport enterprises based on the consistency of key economic indicators with the level of investment and achievement of target parameters of structural cost balance. The advantage of this methodological approach is the possibility of using different components for each component, the possibility of adjusting target ranges and establishing different specific weights in the integral assessment [17].

1.5 RESULTS OF THE DEVELOPMENT OF A METHODOLOGICAL APPROACH FOR ASSESSING THE SUSTAINABILITY AND DEVELOPMENT OF ORGANIZATIONS

The aim of the study is to optimize the assessment of the readiness of road transport enterprises for economic development based on a two-component methodological approach. This will make it possible to investigate the level of investment adequacy and balance of the enterprise's costs, as well as develop recommendations for solving existing problems and outlining strategies for further development.

To achieve the aim, the following objectives were set:

— to propose a methodological approach to assessing the readiness of enterprises for development based on the calculation of an integral indicator of investment adequacy and the level of material costs;

— to test the proposed two-component approach to assessing the state and readiness of enterprises for development;

— to develop strategies for managing the development of enterprises.

The object of the study is to assess the financial sustainability and readiness of road transport enterprises for development. Enterprises engaged in freight transportation chronically lack working capital, which increases risks for current activities and blocks investment opportunities in their development strategies. Thus, in general, net working capital for such enterprises has been negative for the last 10 years, which requires the introduction of modern instruments for financing their activities, which will be accessible and effective [18].

The imbalance in the financing model of motor transport enterprises is further exacerbated by the dominance of material intensity of cost price and operating costs. The share of material costs and services takes up about 80% of all operating costs of the enterprise, which forms a dependence on working capital and the settlement system at enterprises. But the problem of settlements for the provided services for cargo transportation is acute for the studied industry enterprises, whose current assets consist of accounts receivable on average by 2/3. About 20% is accumulated in inventories, highly liquid assets are quite limited [18]. Such a cost structure requires additional working capital to pay VAT and excise duties when making material costs, although it reduces the real burden of value added tax. At the same time, it increases the dependence of enterprises on the level of tax burden by direct taxes — on profit, on property, on the payroll.

The study used methods of generalization (to systematize modern mechanisms for the formation and implementation of economic development), statistical observations (to structure data on the financial activities of motor transport enterprises in Ukraine), a systematic approach (to study the principles of implementing economic development), and the method of expert assessments (to determine the criteria for the economic development of motor transport enterprises and internal indicators of the effectiveness of their activities).

The proposed methodological approach to assessing the state and readiness of motor transport enterprises for development consists, on the one hand, in determining a sufficient level of investment for development, and on the other, a balanced level of activity costs. To take into account the first component, it is proposed to use an integral indicator of investment adequacy, compliance with the minimum regulatory level of which will confirm the accumulation of a sufficient and sustainable level of investment at the enterprise. The components of the integral indicator of investment adequacy are the ratio of capital investments with such parameters as: depreciation, long-term loan capital, non-current assets and equity. The normative minimum level of the integral indicator of investment adequacy of the enterprise will depend on the specified parameters of its components, which allows for multivariate calculations. The proposed integral indicator can be used both at the level of individual enterprises and for an aggregated assessment of the industry as a whole. Taking into account the second component involves determining the level of material costs as the ratio of material and other operating costs to the total amount of income from all types of activity at the enterprise.

1.6 RESULTS OF RESEARCH ON THE USE OF THE PROPOSED METHODOLOGICAL APPROACH BASED ON A TWO–COMPONENT MODEL

The methodological approach to assessing the state and readiness of motor transport enterprises for development consists in determining two components: a sufficient level of investment for development and a balanced level of activity costs.

Definition of the integral indicator of investment adequacy.

The integral indicator of investment adequacy is calculated as follows:

$$IS_t = \sum_{i=1}^{n} \frac{CI_t}{SD_{it}} \cdot P_{it} + \sum_{j=1}^{m} \frac{SD_{jt}}{CI_t} \cdot P_{jt}, \quad (1.1)$$

where IS_t – integral indicator of investment adequacy in the t-th period; CI_t – capital investment in the t-period; P_{it} – weight of the i-th type of resource for the integral indicator of investment adequacy for development in the t-th period; $i = 1, 2, ..., n$; SD_{it} – indicators of the i-th type of development resources in the t-th period; SD_{jt} – indicators of the j-th type of development resources in the t-th period; P_{jt} – weight of the j-th type of resource for the integral indicator of investment adequacy for development in the t-th period; $j = 1, 2, .., m$.

One of the options for the normative level of the integral indicator of investment adequacy is given in **Table 1.1**.

Table 1.1 Normative level of the integral indicator of investment adequacy

Components of the integral indicator of investment adequacy	Calculation of indicators	Minimum level	Weight	Contribution to the integrated indicator
1	2	3	4	5 (gr.3*gr.4)
Depreciation adequacy	Ratio of capital investments to depreciation deductions	2.5	0.25	0.625
Adequacy of long-term loan capital	Ratio of capital investments to long-term debt capital	4	0.25	1.0
Production adequacy	Ratio of non-current assets to capital investments	3.5	0.25	0.875
Equity adequacy	Ratio of equity to capital investments	2	0.25	0.5
Integral indicator of investment adequacy	–	–	1	3.0

Source: compiled by the authors

The first component of the integral indicator of investment adequacy allows to assess depreciation adequacy through the ratio of the annual volumes of capital investments of the enterprise and the volumes

of depreciation deductions. The target minimum level for this ratio is set at 2.5, based on the logic of the formation of its components. Thus, depreciation deductions show only the actual level of wear and tear of existing means of production (fixed assets) formed in previous years. Accordingly, capital investments at the level of depreciation deductions will not ensure even a simple reproduction of fixed assets. Especially in conditions of their fairly rapid depreciation, both moral and technological, and physical.

Therefore, capital investments should not be less than 2.5 times higher than the annual volumes of depreciation deductions. There are certain risks for enterprises that have practically worn out fixed assets and, accordingly, minimal depreciation deductions. This can lead to a wide range of values for this component. This feature is generally inherent in indicators that reflect the ratio between different financial and economic indicators of the activities of enterprises. Therefore, it is advisable to use limit levels of the ratio, in particular, if they exceed 3–4 times the minimum target standard, then such a three-fold minimum is applied, and not the actual result.

The second component of the integral assessment allows to assess the adequacy of long-term loan capital through the ratio of annual volumes of capital investments and accumulated long-term liabilities of the enterprise. Similarly to the previous ratio, capital investments should exceed such liabilities several times, which will indicate an active investment strategy aimed at the economic development of the enterprise.

The next component of the integral assessment is aimed at determining production adequacy through the ratio of the cost of non-current assets and capital investments. The inverse ratio is used here, since this allows to apply comparable weighted rates and target standards. The proposed target standard may be a 2–4-fold excess of assets over capital investments and will depend on the need for fixed assets for the production of goods or the provision of services. Thus, for motor transport enterprises, especially medium and large ones, the presence of a modern transport fleet and its renewal is a critically important condition for maintaining competitiveness, market positions and implementing development strategies.

The next component of the integral assessment is the adequacy of equity, which is assessed through the ratio of equity and capital investments. Similarly to the previous ratio, compliance with the parameters of financial autonomy requires an adequate level of equity. Accordingly, a multiple excess of equity over capital investments is acceptable.

In general, the use of different regulatory limits allows for multivariate calculations and evaluation of results in accordance with the goals and strategies of economic development of enterprises.

To calculate the integral indicator of investment adequacy, the same specific weight of its individual components (ratio) was used, i.e. each of them was 25% (0.25). At the same time, different specific weights can be used for research, as well as expanding the components of the integral indicator. Four components of the integral indicator were used. Accordingly, the minimum normative value of the integral indicator of investment adequacy is 3. And the higher the value of this indicator, the better the potential of the enterprise to implement its economic development strategy, and therefore, a more effective mechanism for managing its economic development is used.

In this case, it seems appropriate to supplement the minimum target level with a sufficient level, in particular, which will be twice as high as the minimum. Conceptually, this is shown in **Fig. 1.1**.

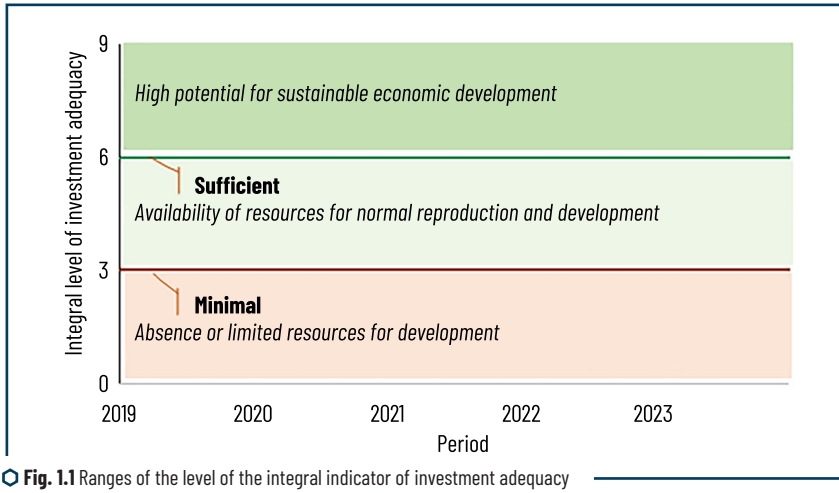

Fig. 1.1 Ranges of the level of the integral indicator of investment adequacy

Source: developed by the authors

This will allow to obtain three ranges for the integral indicator:

1) less than the minimum level – the actual value in this range will indicate the absence or significant limitation of resources for development at the enterprise;

2) between the minimum and sufficient levels – the actual value in this range will demonstrate the availability of resources for normal reproduction and development of the enterprise;

3) above the sufficient level – the actual value in this range will demonstrate a high potential for sustainable development of the enterprise.

Determining the level of material costs.

Taking into account the second component of the methodological approach to assessing the state and readiness of enterprises for development involves determining the level of material costs, the calculation of which is proposed to be carried out as follows:

$$CL_t = \frac{MC_t + OC_t}{I_t} \cdot 100\%, \quad (1.2)$$

where CL_t – level of material costs in the t-th period; MC_t – volume of material costs and costs for payment of services used in production in the t-th period; OC_t – volume of other operating expenses in the t-th period; I_t – total amount of income from all types of activities in the t-th period.

Thus, the level of material cost is the ratio of material and other operating expenses to the total amount of income of the enterprise. As with the first component, it is possible to apply only the minimum target standard or to apply several ranges (**Fig. 1.2**).

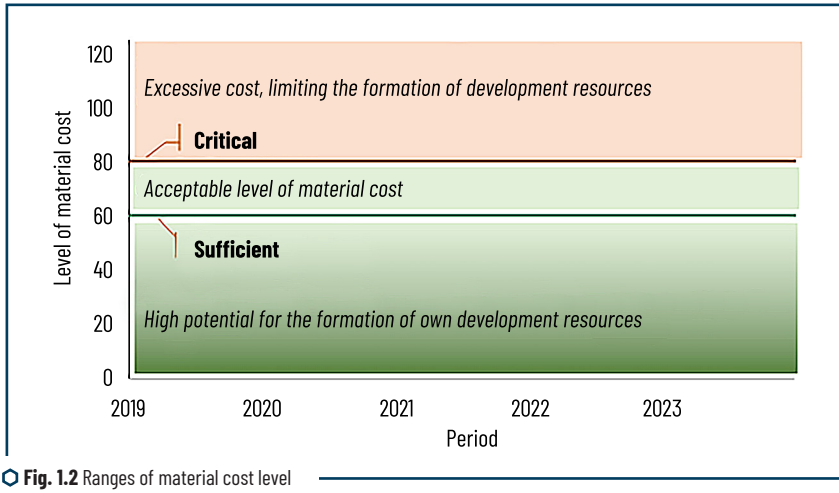

Fig. 1.2 Ranges of material cost level

Source: developed by the authors

So, actual values of the material cost level less than 50% will indicate the presence of a high potential for the formation of the enterprise's own development resources. Values at the level of 50–75% will indicate an acceptable level of material cost, and above 75% will mean a critical level and excessive cost, which limits the formation of sufficient development resources at the enterprise.

The information base for calculating the material cost level is the data of the report on the financial results of the enterprises [19]. Sources of input data for applying the proposed methodological approach to assessing the state and readiness of enterprises for development are given in **Table 1.2**.

Table 1.2 Input data for assessing the state and readiness of enterprises for development

No.	Indicator	Reporting form	Line code
1	2	3	4
1	Integral indicator of investment adequacy		
1.1	Capital investments	Notes to the reporting	–
1.2	Depreciation and amortization	Financial statement (form 2)	2515
1.3	Profit before tax		2290/2295
1.4	Non-current assets	Company balance sheet	1095
1.5	Equity		1495
1.6	Long-term debt capital		1595

Continuation of Table 1.2

1	2	3	4
2	Level of material costs		
2.1	Material costs and costs of services	Financial statement (form 2)	2500
2.2	Other operating expenses		2520
2.3	Net income from sales of products (goods, works, services)		2000
2.4	Other income from operating activities		2105, 2110, 2111, 2112, 2120, 2121, 2130, 2180
2.5	Income from financial activities		2200, 2220
2.6	Other income		2240

Source: compiled by the authors

A certain problem for assessing the state and readiness of enterprises for economic development for external experts and researchers is the rather veiled data on investments in general, and capital investments in particular, in the financial statements of enterprises. On the one hand, such data are quite confidential and require proper protection of commercial interests.

1.7 TESTING THE PROPOSED TWO–COMPONENT METHODOLOGICAL APPROACH TO ASSESSING THE READINESS OF ORGANIZATIONS FOR DEVELOPMENT

The testing of the methodological approach showed low resource capacity of the studied enterprises.

Thus, the dynamics of the integral indicator of investment adequacy showed that in general for enterprises engaged in road freight transportation, its level is significantly lower than the target normative value.

In particular, in 2013 it was 2.1 points with a minimum level of 3 points. And during 2015—2023 its value on average ranged from 1.2 to 1.7, that is, it was in the range of absence or limited resources for economic development [18]. This confirms the widespread practice of domestic enterprises in general to rely on internal resources for financing investments. In particular, in 2020, only 6.6% of capital investments in the economy as a whole were financed by bank loans and other loans [18].

The calculation of the second component of assessing the state and readiness of enterprises for development based on aggregated data for freight road transportation enterprises in Ukraine showed the following. The overall level of material costs of the specified type of economic activity is quite moderate and during 2013—2023 did not exceed 40% [18]. This confirms the presence of the potential for ensuring the efficiency and profitability of providing freight transportation services by road transport. At the same time, the application of the developed approach to the reporting of individual motor transport enterprises showed results that differ from industry-wide calculations.

The calculations were carried out using data from three motor transport enterprises from different regions of Ukraine and with different potential: Kyiv Production Company Rapid, PJSC ATP 11263, Dnipro, PJSC Chernihiv Motor Transport Enterprise 17462. The calculation of the integral indicator of investment adequacy showed that during 2018–2023 the studied enterprises did not reach the target regulatory level (**Table 1.3**).

Table 1.3 Average level of indicators for assessing the state and readiness for development for individual enterprises during 2018–2023

Indicators / enterprises	Value
Integral indicator of investment adequacy	Standard level > 3
PJSC "Kyiv Production Company "Rapid", Kyiv	2.4
PJSC "Chernihiv Motor Transport Enterprise 17462"	2.0
PJSC "ATP 11263", Dnipro	2.7
Level of material costs of the enterprise's activities	Standard level < 60
PJSC "Kyiv Production Company "Rapid", Kyiv	63.9
PJSC "Chernihiv Motor Transport Enterprise 17462"	54.5
PJSC "ATP 11263", Dnipro	74.3

Source: compiled by the authors based on enterprise reporting [19]

In addition, more powerful enterprises from Kyiv and Dnipro generally have a higher level of the investment adequacy indicator, which confirms the feasibility of building potential and investment opportunities. Analysis of the integral indicator of investment adequacy by individual components in the context of the studied enterprises shows significant differences in their business models and ability to implement development strategies (**Table 1.4**).

Table 1.4 Assessment of compliance with the regulatory level of individual components of the integral indicator of investment adequacy for individual enterprises during 2018–2023

Indicators / enterprises	Depreciation adequacy	Long-term debt capital adequacy	Production adequacy	Equity adequacy
Standard level	> 2.5	> 4	> 3.5	> 2
PJSC "Kyiv Production Company "Rapid", Kyiv	4.79	2.24	1.36	0.91
PJSC "Chernihiv Motor Transport Enterprise 17462"	1.23	2.13	5.03	3.41
PJSC "ATP 11263", Dnipro	0.98	0.40	5.47	3.68

Source: compiled by the authors based on enterprise reporting [19]

So, PJSC "Kyiv Production Company "Rapid" in 2018–2023 has a high level of depreciation adequacy, which was achieved primarily due to active investment activity. The enterprise, while maintaining a

traditionally low share of depreciation deductions in the structure of operating expenses for the industry, directs resources to capital investments that are several times higher than the annual depreciation of fixed assets. The enterprise also uses long-term loan resources more actively, although their volumes are somewhat lower than capital investments.

The greatest influence on the formation of the integral indicator of investment adequacy for PJSC "Chernihiv Motor Transport Enterprise 17462" and PJSC "ATP 11263" was production adequacy and equity adequacy. In particular, during the period under study, these indicators exceeded the target standard. Probably, enterprises are serious about maintaining an appropriate level of financial autonomy and minimizing risks associated with obligations to creditors.

Analysis of financial statements of transport enterprises showed that most of them do not provide open data on their capital investments, which complicates the analysis of their activities by external experts. Therefore, their investment activity can be evidenced by data on the renewal of fixed assets, cash flows from investment and financial activities, etc.

For PJSC "Chernihiv Motor Transport Enterprise 17462", the results of assessments of the integral indicator of investment adequacy by components are largely comparable with the studied enterprise from the city of Dnipro. In general, it should be noted that an important aspect of applying the developed methodological approach is a sufficient information base, primarily regarding the volumes of capital investments or another aggregate indicator of investment volumes.

The assessment of the studied enterprises showed that the problem of excessive cost is quite relevant. Thus, the level of material costs for enterprises is almost twice as high as that calculated for the freight road transportation industry as a whole. In particular, for PJSC "ATP 11263" it is almost 75%, that is, the costs of fuel, spare parts and other material costs make up almost 3/4 of the total revenue of the enterprise. The minimum target standard of the level of material costs is not observed for PJSC "Kyiv Production Company "Rapid". And only PJSC "Chernihiv Motor Transport Enterprise 17462" has a level of material costs lower than 60%, but also significantly exceeds the average industry level.

Calculation of the integral indicator of investment adequacy and the level of material costs for individual ATPs confirms the conclusions obtained about their weak investment readiness to implement ambitious strategies of economic development in the freight transportation market. This increases the risks of further technological lag of enterprises in the industry, the preservation of non-equivalent exchange and pressure of the transport sector on all other related sectors of the economy and markets, and the limitation of the resource base for the formation of budgets at various levels.

DISCUSSION OF THE RESULTS OF IMPLEMENTING A TWO-COMPONENT METHODOLOGICAL APPROACH TO ASSESSING THE READINESS OF ORGANIZATIONS FOR DEVELOPMENT

A methodological approach to assessing the sustainability of organizations based on a two-component assessment is substantiated, which consists, on the one hand, in determining a sufficient level of investment for development, and on the other, a balanced level of activity costs.

For the first component (2.1), it is proposed to use an integral indicator of investment adequacy. The methodology for its calculation is based on combining the dependencies between the volumes of capital investments and other parameters of activity (depreciation deductions, long-term loan capital, non-current assets, equity, etc.). The normative minimum level of the integral indicator of investment adequacy will depend on the specified parameters of its components, which allows for multivariate calculations. One of the options for the normative level of the integral indicator is given in **Table 1.1**. The calculation was carried production adequacy, adequacy of equity. Under these conditions, the integral indicator of investment adequacy is determined at the level of 3.0. The ranges of the level of the integral indicator of investment adequacy are proposed: minimum, sufficient, high (**Fig. 1.1**).

The second component (2.2) reflects the ratio of material and other operating costs to the total income of the enterprise. It is possible to apply the minimum (critical) target standard, which is set at 60%, or to apply several ranges (**Fig. 1.2**): sufficient, acceptable, critical.

An assessment of the dynamics of volumes and the level of material costs for freight road transportation enterprises in Ukraine was carried out, based on the results of which it can be concluded that during 2013–2023 the level of material costs did not exceed 40%. This confirms the potential for ensuring the efficiency and profitability of providing freight transportation services by road. At the same time, the application of the developed approach to reporting by individual road transport enterprises showed results that differ from industry-wide calculations.

The sustainability of road transport enterprises was monitored based on the consistency of key economic indicators with the level of investment and the achievement of target parameters of the structural balance of its costs. It was found that the majority of road transport enterprises have weak financial stability.

Three road transport enterprises from different regions of Ukraine and with different potential were selected for the study: PJSC "Kyiv Production Company "Rapid", Kyiv, PJSC "ATP 11263", Dnipro, PJSC "Chernihiv Road Transport Enterprise 17462".

Testing of the proposed two-component assessment of the state and readiness of enterprises for development showed their low resource capacity and the presence of the problem of excessive cost (**Table 1.3**). Thus, the level of material costs for enterprises is almost twice as high as that calculated for the freight road transportation industry as a whole. The assessment of compliance with the regulatory level of individual components of the integral indicator of investment adequacy for the studied motor transport enterprises in 2018–2023 is presented in **Table 1.4**.

The dynamics of the integral indicator of investment adequacy showed that, in general, for enterprises engaged in road freight transportation, its level is significantly lower than the normative value. This indicates the dominance of survival strategies among enterprises, rather than development, and weak state policy that does not stimulate active investment in a legal transparent environment.

It is proposed to take into account the developed approach in the implementation of state support for enterprises that actively invest, increase legal turnover, income and labor costs. Benefits can be introduced for enterprises that have higher than the normative values of the developed indicators and will adhere to such conditions for a long period. In particular, if they are fulfilled for three or more years, such enterprises may be exempted from paying income tax if they are invested in development.

The developed two-component methodological approach makes it possible to optimize the assessment of the readiness of motor transport enterprises for economic development. Based on the interpretation of economic development as a transition to a new qualitative state and new possibilities for the functioning of the enterprise, the basis for its implementation is a sufficient level of investment and the availability of sources of their financing. And the necessary result of the success of such investments should be a more balanced structure of operating costs, which will confirm the systematicity, long-term nature and durability of changes.

The development of research using the proposed methodological approach is that its use will allow rationalizing the mechanism of economic development management and more clearly identifying the correspondence of current and projected performance indicators of both domestic and foreign enterprises to their development goals.

The limitations of the developed methodological approach include the impossibility of including profitability as the main internal resource for financing the development of the enterprise in the integrated assessment of the adequacy of profitability. This component quite organically corresponds to the task of assessing the integral indicator of investment adequacy. But its practical application is complicated by possible losses of the enterprise or minimum profit values. This is a fairly typical situation for many motor transport enterprises, which will actually lead to excessive values of this ratio and distortion of the results obtained. Therefore, its application requires the availability of adequate data on the profit of enterprises and their proper calibration.

The disadvantages include the fact that the problem for assessing the readiness of enterprises for development for external experts is the rather veiled data on investments in general and capital investments in particular in financial statements.

STRATEGICALLY–ORIENTED MANAGEMENT OF ORGANIZATIONAL DEVELOPMENT

Strategically-oriented management of organizational development is a scientifically substantiated influence of management on the socio-economic development of an organization, which ensures long-term, sustainable growth of the results of production and commercial activities. The development management system consists of interconnected subsystems: production, technological, financial, innovation, communication, structural and organizational, marketing, personnel, legal support, economic, socio-psychological, motivational subsystems [20].

The main tools of strategically-oriented management of development in order to achieve the main target benchmarks are the development and implementation of appropriate strategies. Organizations that have a strategy and implement strategically-oriented management of activities always have the opportunity to act consistently and systematically both in the internal environment and in the conditions of a changing external environment, which increases the likelihood of achieving the set goals for further development.

Let's consider the strategies that can be implemented by an organization to ensure financial stability and optimize resources:

1. The reserve management strategy involves an active process of accumulating and managing financial reserves to ensure financial stability its obligations. The main provisions are presented in **Fig. 1.3**.

2. The asset diversification strategy consists of distributing investments between different asset classes in order to reduce risk and ensure greater liquidity. The main provisions are presented in **Fig. 1.4**.

3. The profit reinvestment strategy involves the redistribution of profit received from activities in order to maintain or increase the organization's liquid assets. The main goal is to use the cash that the enterprise already has to generate additional profit. The main provisions of this strategy are presented in **Fig. 1.5**.

4. The strategy of optimizing liabilities and obligations is aimed at balancing the structure of the organization's liabilities and assets in order to ensure an optimal balance between the liquidity of assets and their financial stability. This strategy can help reduce financial costs, increase profitability and improve financial risk management. The main provisions of the strategy are presented in **Fig. 1.6**.

5. The risk-based liquidity management strategy emphasizes control over risks associated with liquidity, in particular ensuring financial stability in a changing financial environment, and helps manage the liquidity of assets in conditions of increasing risk. The main provisions of the strategy are presented in **Fig. 1.7**.

6. The strategy of active asset liquidity management involves active investment and management of liquid assets to ensure maximum efficiency and profitability, as well as optimization of the organization's risk. The main provisions of the strategy are presented.

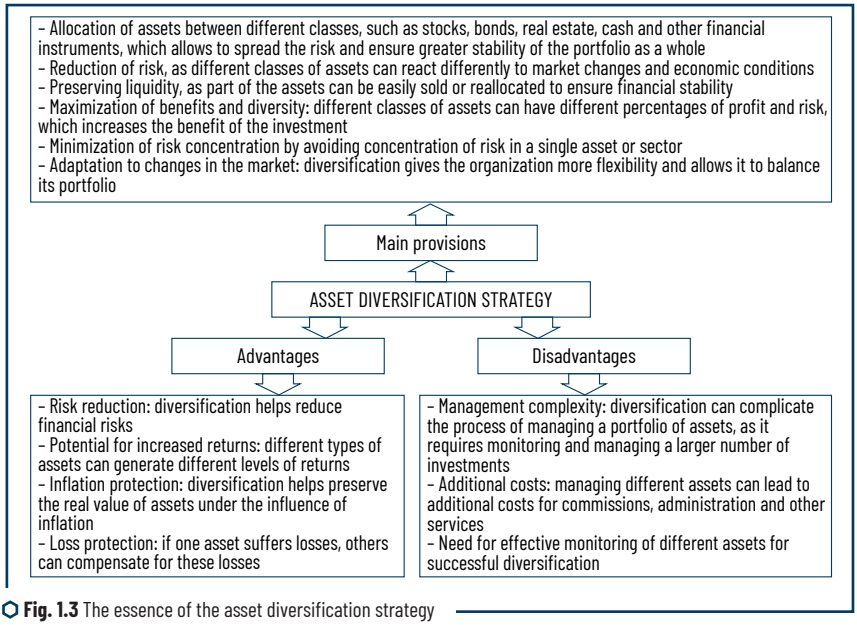

Fig. 1.3 The essence of the asset diversification strategy

Source: compiled by the authors

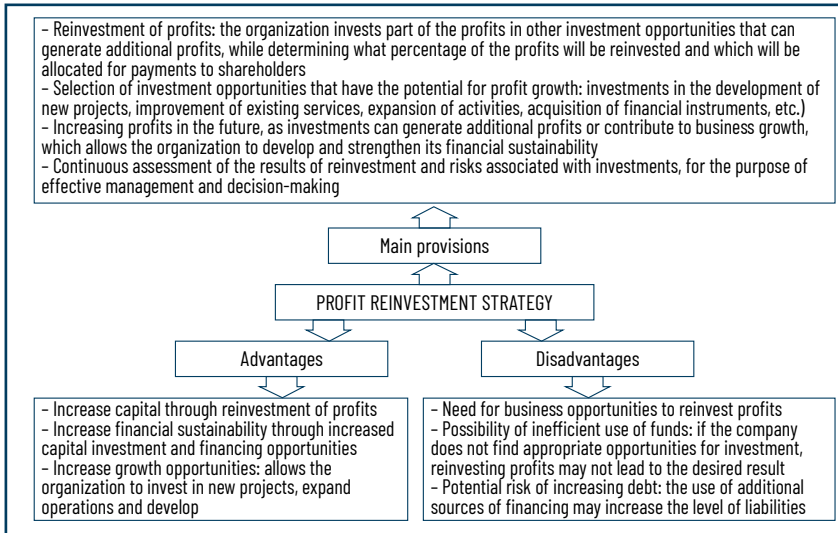

Fig. 1.4 The essence of the profit reinvestment strategy

Source: compiled by the authors

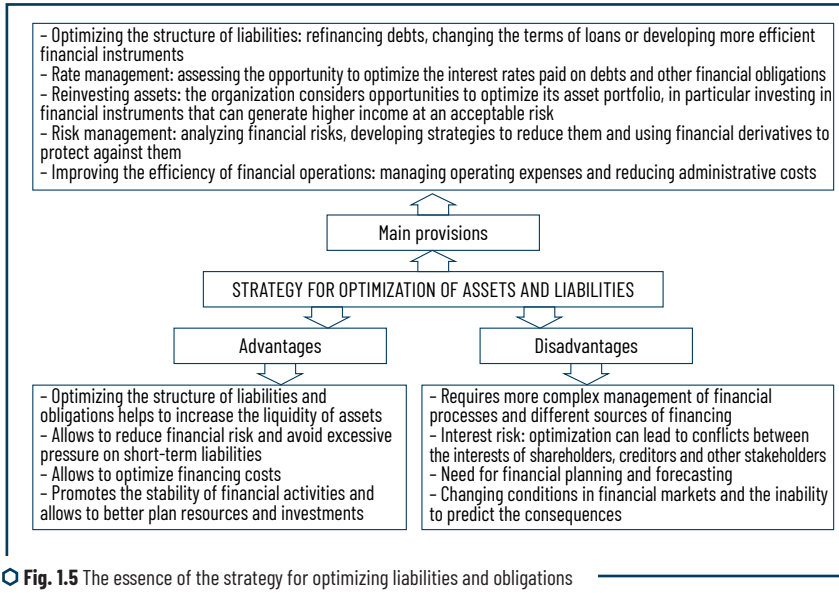

Fig. 1.5 The essence of the strategy for optimizing liabilities and obligations

Source: compiled by the authors

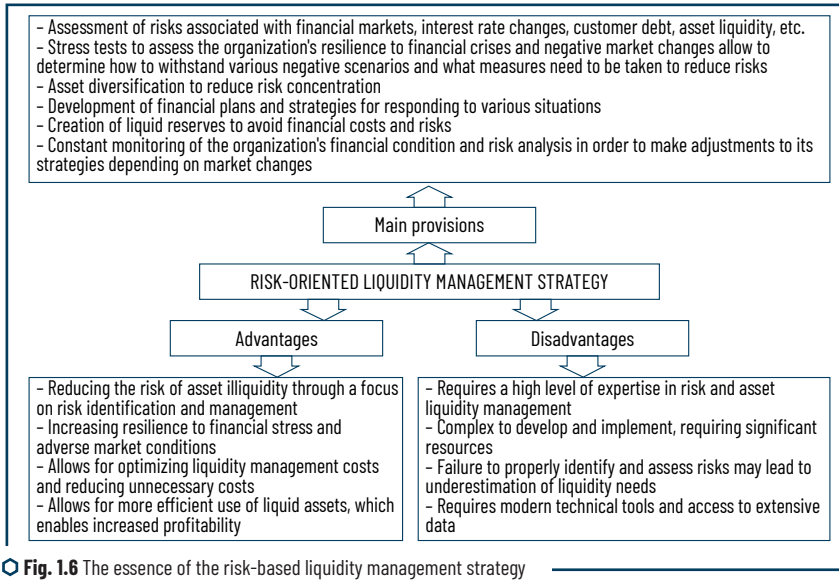

Fig. 1.6 The essence of the risk-based liquidity management strategy

Source: compiled by the authors

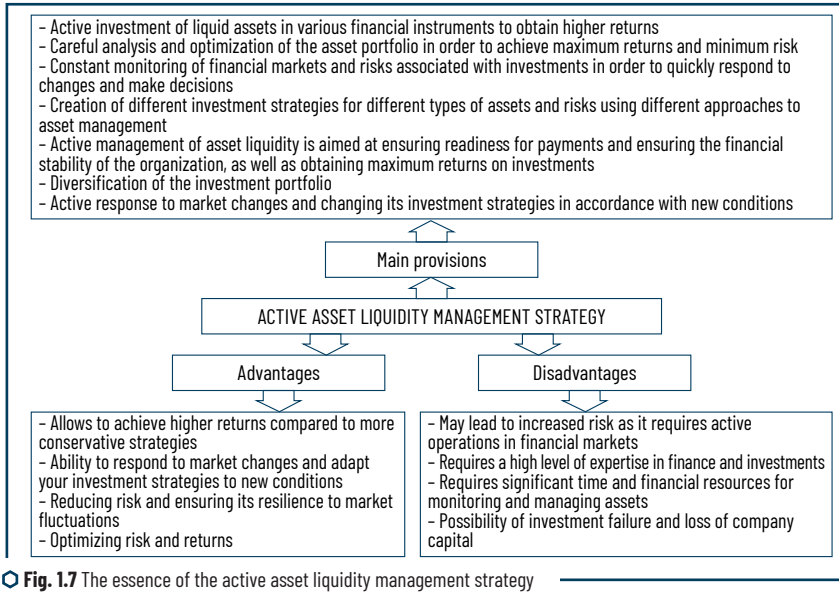

Fig. 1.7 The essence of the active asset liquidity management strategy

Source: compiled by the authors

The study determined that the implementation of combined strategies can be a key factor in achieving financial stability and ensuring the development of organizations. The need for further improvement of resource management strategies, careful monitoring and risk management, as well as the development of the ability to adapt different strategies to the unique conditions and needs of their activities is important.

To further strengthen financial stability and maintain competitiveness, it is worth considering opportunities for the implementation and improvement of innovative strategies. The emphasis on the implementation of advanced technologies can not only provide an advantage in the market, but also help solve possible challenges and make any organization less vulnerable to fluctuations in the external environment. The key drivers of success and sustainable development in the future may be the expansion of markets and the ability to implement innovations.

As a result of the study, a two-component methodological approach was developed, which makes it possible to optimize the assessment of the readiness of enterprises for development based on the calculation of the integral indicator of investment adequacy and the level of material cost. The integral indicator of investment adequacy was calculated based on the comparison of depreciation charges, equity, long-term loan capital, non-current assets with the size of capital investments. The level of material cost was determined based on the comparison of material and other operating costs with the income of the enterprise.

The proposed methodological approach was tested, which showed the low resource capacity of enterprises. The dynamics of the integral indicator of investment adequacy showed that in general for enterprises engaged in road freight transportation, its level is significantly lower than the normative value. This indicates the dominance of survival strategies, not development, among motor transport enterprises, and weak state policy, which does not stimulate investment activity in the legal environment. The advantage of the developed methodological approach is the possibility of using different components for each component, setting different weights in the integral assessment, and the possibility of adjusting target ranges.

Strategies for managing the development of the organization have been developed: a reserve management strategy, an asset diversification strategy, a profit reinvestment strategy, a strategy for optimizing liabilities and obligations, a risk-oriented liquidity management strategy, and an active liquidity management strategy. The implementation of combined strategies can be a key factor in achieving financial stability, optimal risk management, and the possibility of further development of organizations.

The destabilization of the geopolitical, socio-economic and security situation in the world has exacerbated the issue of sustainable development of regional economies and deepening their interaction. Ensuring the growth of the national economy as a whole and individual regions in particular makes the search for mechanisms aimed specifically at internal sources relevant. Spatial development is gaining particular importance due to the increasing role of transport infrastructure in ensuring the economic growth of regions.

The socio-economic heterogeneity of regional systems plays a decisive role in the formation of mechanisms for ensuring economic growth, which determines the diversity and contradictions of the effects of transport infrastructure on them. This is expressed in the fact that similar infrastructure facilities in different regions can have different organizational and economic effects. Thus, the appearance of a road can

lead to the acceleration of material flows, thereby contributing to the development of the region's economy, and on the other hand, can stimulate an accelerated outflow of population. At the same time, the principles of managing social development and economic growth of regions obtained in practice do not allow to take into account the functional diversity and inconsistency of the effects of transport infrastructure and thereby complicate the search for effective mechanisms for ensuring regional development. growth based on the development of transport infrastructure.

Therefore, the study focuses on the actualization of the need to introduce innovative mechanisms into the economy of regions by determining the conditions necessary and sufficient for the implementation of the role of transport infrastructure as one of the sources of sustainable economic growth. In this regard, the knowledge of the essence and patterns of the mutual influence of transport and regional economic development is of great theoretical and practical interest.

1.8 CONDITIONS AND FEATURES OF ENSURING ECONOMIC GROWTH OF TRANSPORT INFRASTRUCTURE

At the beginning of our study, the task is to understand the conditions that allow transport infrastructure to be interconnected with regional economic systems, and to formulate a general concept of improving mechanisms for ensuring economic growth of regions based on the development of transport infrastructure.

It should be noted that one of the conditions, in particular, is the need to take into account the stability of the inflationary or recessionary gap in which various regional territorial entities are located. The state when prices in some regions exceed the equilibrium, and aggregate demand consistently lags behind supply, is accompanied in other regions by a state when prices are lower than the equilibrium, and demand is constantly not satisfied.

The difference in conditions also requires different mechanisms for activating economic growth. The main mechanism for stimulating growth in regions with insufficient supply is the stimulation of aggregate demand. It is characteristic of such regions that infrastructure development is carried out by private agents.

As an example, it is possible to cite the process of formation in the transport infrastructure of the function of ensuring the movement and distribution of goods (associated with the development of logistics and trade). Successful resolution of issues of stimulating growth on the basis of this mechanism in individual regions has initiated interest in it as a basis for regional development [1]. However, this mechanism, as a national practice of managing regional development, cannot always ensure the growth and development of the entire complex of regional economic systems.

The main feature of regions in the inflationary gap is that stimulating demand negatively affects their economic system, since demand already exceeds supply. Such regions need targeted state investments, including for the development of transport infrastructure. The main mechanisms here should be aimed at expanding the capabilities of regional industrial production, taking into account the established industry specifics and stimulating interregional industrial cooperation.

In addition to the above-mentioned features of infrastructure development in different regions, one should not lose sight of the implementation of state interests in general. An important factor in the formation of an economically integrated space is the transport infrastructure, which provides living conditions and economic activity in the regions, contributes to the creation of a favorable investment environment and is a condition for the expansion of industrial and social structures. The formation of economic integrity and the establishment of regular interactions mean the strengthening of interdependence and the development of interregional production interactions.

Thus, it can be noted that the dynamics of the development of transport infrastructure in some regions and the parameters of the economic situation in other regions are mutually determining (the situation in each region depends on decisions and events in other regions). At the same time, it is not possible to forget about the internal property of regional economic systems, namely the possibility of mutually beneficial exchange. And here the development of transport infrastructure expands the possibilities of beneficial interaction for all regions through the formation of a single economic space and the deepening of interregional cooperation.

In addition to the tasks of the global and national division of labor and the state task of connecting the country's territory, there are tasks of lower territorial levels. In this context, the development of transport infrastructure should be linked to the economic level of the regional system, the goals set for it, the scale of the existing and prospective production potential. During periods of crisis and post-crisis stages of development, the need for state participation in economic regulation increases sharply, since the state is the only agent capable of focusing on systemic goals under any circumstances. By implementing infrastructure projects and ensuring the integrity of the territory, the state contributes to reducing uncertainty and lays the basic foundation for overcoming crisis phenomena.

Next, it is possible to highlight the following essential condition that must be taken into account when forming mechanisms for activating regional growth. It consists in the mutual influence of economic systems of different levels and different regions, which can manifest itself in the interregional movement of population, resources, and investments. Thus, when implementing some regulatory influences in the field of transport infrastructure, it is necessary to take into account both internal and interregional flows of population and investment. In particular, the construction of highways in remote and depressed areas of the country is often accompanied by an outflow of population. That is, measures to develop transport infrastructure to achieve the goal of its attraction and consolidation should be accompanied by additional solutions that could stimulate such effects.

In addition to taking into account the conditions of regional economic systems and the specifics of interregional cooperation, another necessary condition for activating regional growth through the development of transport infrastructure is the inclusion of the regional aspect in the system of public administration. Studies show that the effectiveness of the same measure can be assessed differently by different agents. That is, the effectiveness of measures cannot be assessed according to conditional principles. For example, the construction of a relevant infrastructure facility may have a negative commercial effect, but a positive budgetary effect, for example, in the case when the city (regional) authorities decide to introduce a fee for the passage of commercial transport. Otherwise, the construction of a highway may

require the demolition of some industrial building, but it can increase the transport accessibility and attractiveness of the territory for the population, stimulate the organization of new service enterprises along the route (public catering, car workshops), which can lead to an increase in the standard of living, income, population, land value and an increase in tax revenues. Thus, with negative effects for one entity, there are positive effects for others, including for local (regional) authorities. This indicates the importance of harmonizing different opinions and interests in planning and organizing the development of transport infrastructure. Therefore, it is advisable to involve regional and local administrations, as well as the local community, in assessing the effectiveness of measures and developing mechanisms for their implementation.

Thus, for the effective organization of transport infrastructure and improving the mechanisms for managing its impact on the economic development of regions, it is necessary to take into account all the above conditions, they are reflected in **Fig. 1.8**.

Thus, solving the above tasks allows ensuring the effectiveness of management mechanisms and the applicability of this toolkit for any regional territorial entities. A natural consequence of the existence of various connections and the complexity of the subject of research is the diversity of approaches to assessing the role of transport infrastructure and to the formation of mechanisms for ensuring economic growth of regions based on the development of transport infrastructure.

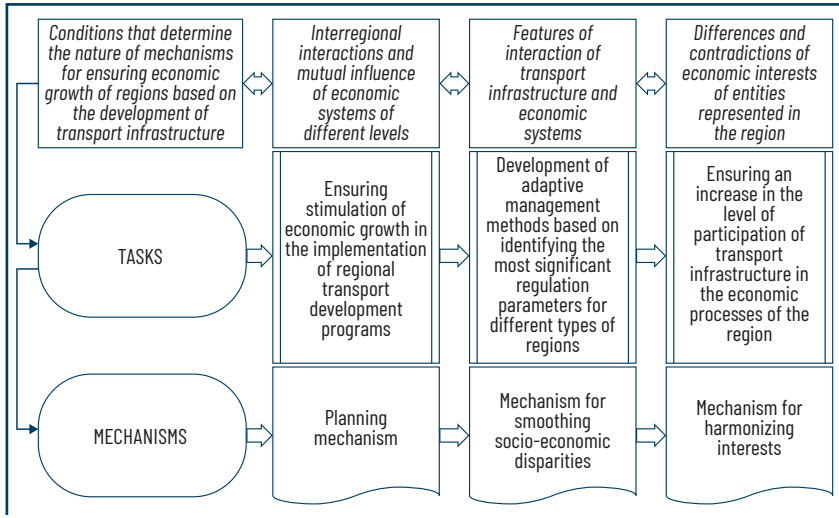

Fig. 1.8 General concept of improving mechanisms for ensuring economic growth of regions based on the development of transport infrastructure

Source: [2–4]

At the next stage of the study, it should be noted that the complexity of the transport infrastructure system, the multidirectional impact on both the economic and social systems determined a wide range of

tools for forming mechanisms for ensuring regional growth based on the development of transport infrastructure. Having studied and generalized international experience, a systematization of methodological approaches and methods for forming mechanisms for the development of transport infrastructure was obtained (**Table 1.5**).

● **Table 1.5** Systematization of methodological approaches and methods for forming mechanisms for the development of transport infrastructure

Main aspects of the methodology	Development of management mechanisms	Advantages of approaches	Disadvantages of approaches
Descriptive approach — Technocratic method			
Analysis of the state and technical parameters of transport networks	Organization of interaction between modes of transport, harmonization of network operation	Systematization of transport activities	Complexity of comparison and quantification
Descriptive approach — Economic and geographical method			
Description, assessment of quantitative indicators proceed from economic sense	Regulation of the provision of infrastructure facilities in various territories	Comparison possibilities (ranking, assessment of dynamics)	Lack of consideration of spatial characteristics
Economic and analytical approach — Balance method			
Transport is considered as one of the branches of the economy through cost indicators	Improving the planning of the distribution of costs for the development of transport infrastructure	Depth of assessments and ideas about the parameters of the interconnections of industries	Laboriousness; the balanced scenario does not seem realistic enough
Economic and analytical approach — Capital method			
Cost and quantitative assessments of transport infrastructure as a capital resource	Regulation of interregional interactions on the use of transport infrastructure	Assessment of the role of transport in comparison with other resources (labor and capital)	Complexity of modeling spatial aspects
Economic and analytical approach — Investment method			
Cost assessments of transport infrastructure as an investment, providing for the return of invested funds	Organization of principles of joint financing of transport infrastructure development	Possibility of assessing the time horizon of the implementation of the Transport Infrastructure Development Project; the effectiveness of transport infrastructure development for individual companies	Contradictions between the guidelines for increasing the efficiency (return) of investments and stimulating regional development processes

Source: [5-7]

Therefore, it is possible to conclude that there are theoretical premises that are the basis for further research and analysis. Initially, it is assumed that the territorial location and economic significance of transport infrastructure are extremely heterogeneous, the level of its development differs significantly between regions. This necessitates the structuring of regions according to the ratio of economic characteristics and transport infrastructure indicators.

Therefore, for an adequate analysis and assessment of the impact of transport infrastructure on economic growth and, ultimately, for the formation of adaptive management methods, it is necessary to take into account the spatial structure in order to correctly understand the scale, nature of the inclusion of transport infrastructure in the regional economic system, the level of interregional connections. that it provides. On the other hand, it is important to take into account the main characteristics of the economic system within which the analysis of transport infrastructure takes place.

The essence of the analysis in this approach is not limited to the study of individual aspects of transport infrastructure or the economic environment. Spatial prerequisites for the formation and support of economic interactions have been identified, which, together with the assessment of the main parameters of the economic system, allows to put forward adequate hypotheses regarding the determination of the main factors and conditions of the economic development of the region and further determine the mechanisms by which this development can be carried out. Thus, the conditions considered above that allow transport infrastructure to be interconnected with regional economic systems and methodological approaches and methods for forming mechanisms for the development of transport infrastructure make it relevant to improve the mechanisms for implementing management functions presented in **Fig. 1.9**. Let's consider it an important scientific and managerial task to determine the parameters and conditions for the functioning of transport infrastructure necessary to stimulate the growth and development of a specific regional economic system. Thus, a fundamental basis is formed for the implementation of these mechanisms in practice, since the required state of transport infrastructure significantly depends on the current structure of the economy.

1.9 TRANSPORT INFRASTRUCTURE DEVELOPMENT PLANNING MECHANISM

To increase management efficiency, it is necessary to create and develop an information and analytical system for managing the implementation of programs at different levels [8]. The main tasks of such a system are: registration of analytical information in various forms (in terms of basic indicators; planned indicators, territories, etc.); design of transport development programs both in territorial and temporal terms with a breakdown into objects, nodes, directions and corridors with their current and prospective characteristics.

Such a large-scale and intensive process of forming programs in the system of public administration and local self-government was designed to solve problems related to determining the goals of regional and local authorities in terms of stimulating the economy and ensuring the focus of the territorial development process. However, it is worth saying that this mechanism is not completely perfect, since the formally

approved requirements for ensuring territorial development were not properly supported by an understanding of the nature of the impact of transport infrastructure on the economic growth of individual territories, ways to enhance growth through transport infrastructure. One way to overcome such planning difficulties is to transfer planning goals from higher-level programs. In general, this approach corresponds to the established practice of setting management tasks from top to bottom.

It should be noted that the transformation of the principles of public administration will allow to increase awareness of significant interrelationships and develop mechanisms that will have a tangible impact on the development of territories. This will make it possible to increase the degree of compliance of the planned process of state and local administration with the goal of regional growth. It should be expected that the priority of the principle of territorial development will contribute to the most complete achievement of the goal of activating regional growth. At the same time, the system of indicators that will reflect the stages and levels of achieving the goal needs to be improved. The relevance of such improvement is dictated by the need to monitor the process of stimulating growth through the development of transport infrastructure, as well as the need for an objective assessment of the existing reality and options for territorial development.

The principle of purposefulness in application to planning activities for the development of territories provides that for territories with different characteristics a set of special actions or measures will be developed that will increase the efficiency of transport infrastructure as a source of growth. Efficiency here should be understood as the most close to the goal of economic growth of the territory through the use of material, labor and energy resources of the transport industry.

No less important is the group of principles related to an adequate description of existing socio-economic systems and the study of the features and patterns of their development, which provides for the strengthening of the regional vector and the systematization of knowledge about the genesis of socio-economic systems of various types. A substantial and meaningful understanding of the trends in the development of socio-economic systems, obtaining reliable ideas about their reactions to external influences is the most important condition for the implementation of the scientific principle in the process of territorial development planning. Based on reliable data, it is possible to develop measures that will be effective in different conditions for different regions. This ensures the implementation of the principle of reality. In the absence of scientific research of systemic reactions, it is impossible to develop effective mechanisms for improving socio-economic systems, it is impossible to determine the level of resource provision that can lead to solving problems. The choice of methods according to any other principle, such as the introduction of best practices, does not remove the question of understanding and assessing the consequences of implementing certain decisions. At the same time, the implementation of the principle of connection with the socio-economic life of the territory is not achieved, as indicated in the source [9]. Only under the condition of a meaningful analysis of the conditions for the development of regional economic systems and their connections with the transport infrastructure is it possible to select and develop such managerial influences that can significantly affect the system in a certain direction [10], which makes it possible to successfully implement the planned function of managing the development of transport infrastructure.

Another group can be those principles that contribute to the formation of the sustainability of the planning process for the development of organizational and economic relations of transport infrastructure. These include the principles of continuity and flexibility. Continuity should be understood as the ability of the management system at any time to determine the development process with varying degrees of success. It is obvious that in conditions of crisis, with changes in national and/or international macroeconomic trends, with changes in priorities and key principles of national policy, manageability and predictability may decrease, which requires a new scientific understanding and coordination with reality. Reproducing this stage in new, changed conditions and developing actions corresponding to the prevailing circumstances will be an expression of the principle of continuity. The flexibility of the public administration planning process is expressed in the ability to perceive and take into account such transformations in the current and subsequent planning cycles.

Therefore, it is possible to conclude that when implementing the priority of territorial development, it is necessary to deepen the established programs for the development of transport infrastructure through objective assessments of connections with socio-economic systems of different levels [11].

1.10 MECHANISM FOR SMOOTHING SOCIO–ECONOMIC DISPARITIES IN THE DEVELOPMENT

Earlier in our study, the need to perceive regional economic systems as complex and heterogeneous elements of the national system, in which multidirectional trends can operate, was substantiated. The features of economies in conditions of inflationary and recessionary gaps were highlighted. The essence of this division is that different properties of economic systems imply different mechanisms for activating economic growth. Since the territories of the recessionary gap are characterized by a state of overproduction, the main vector of approaching the equilibrium state is determined by economic theory to stimulate demand. Unlike recessionary territories, territories in the inflationary gap have a price level below the equilibrium, which hinders production processes, which ultimately leads to a significant excess of demand over supply. Therefore, the use of mechanisms for stimulating demand turns out to be detrimental for such territories due to the intensification of negative trends and an increase in deviations from the equilibrium state. It was also proven that this property of economies is systemic and affects not only the sphere of transport infrastructure.

For this reason, the formation of mechanisms for stimulating economic growth through the development of transport infrastructure should be adapted to the current situation in the regions. Such unevenness of the national economy makes it necessary to develop mechanisms that would improve the proportions of regional development and reduce gaps.

Based on the study of the conditions of economic growth in regions of the inflationary gap, it is possible to conclude that it is necessary to take into account important organizational conditions to ensure economic growth. Based on this, let's highlight the main groups of measures and areas of improvement for stimulating the economic growth of regional territorial entities in the inflationary gap through the development of transport infrastructure, in particular:

1. Stimulating the organization of primary processing of the flow of raw materials with coordination between private and regional business entities at the highest level of management; state support for industrial and infrastructure development. Mechanisms for harmonizing industry interests and interests of regional and local development in the formation of transport infrastructure:

— legislative registration of incentives for the creation of industrial transport networks taking into account the potential for regional growth; financial support for transport infrastructure development projects; control over targeted spending of funds; coordination of national-level interests in industrial development and regional-level interests in economic growth;

— development of transport infrastructure projects to ensure regional growth; financing; control over the technological and technical level of transport infrastructure project implementation; implementation of measures invested in stimulating industrial development;

— development of transport infrastructure projects at the regional level to ensure regional growth; interregional cooperation in the formation of transport infrastructure development projects; organization and implementation of a transport infrastructure development project; development of measures to stimulate the development of industry on the basis of the created infrastructure.

2. Stimulation of the production of final demand products, organizational work by local and regional administrations, production associations. Mechanism for the development of public transport infrastructure networks based on state funding:

— legislative provision of opportunities for interregional cooperation on infrastructure and industry development; financial support for transport infrastructure development projects; control over targeted spending of funds;

— development of transport infrastructure projects to ensure regional growth; organization and implementation of a transport infrastructure development project; development of measures to stimulate economic growth on the basis of the created infrastructure.

3. Purposeful formation of territorial and economic relations for the organization of production. Creation of conditions for attracting flows of technological transfers from highly developed regions. Mechanisms for preserving transport infrastructure and increasing its level of improvement and quality. At the initial stage, the construction of better roads and the organization of roadside service. Involvement of the most convenient places in economic turnover:

— financial support for projects to improve the existing transport infrastructure system; control over targeted spending;

— development of the regional level and financial support for projects to improve the existing transport infrastructure system; organization and implementation of projects to improve transport infrastructure; development of measures to stimulate economic growth based on the infrastructure being created.

Thus, it is possible to conclude that most regions have significant potential for significant economic growth. However, its implementation is associated with the implementation of a set of measures, and specialized for different groups of regions. Therefore, the next step is to develop mechanisms that ensure the most complete consideration of the interests of local communities in the growth of the local economy. The importance of developing a coordination mechanism is due to the fact that it is also necessary to ensure

that national interests and the interests of individual manufacturing companies and industries are taken into account.

MECHANISM FOR HARMONIZING INTERESTS IN THE TRANSPORT INFRASTRUCTURE DEVELOPMENT SYSTEM

Transport infrastructure projects, oriented towards end-use, implement social functions and ensure the expansion of consumer demand. Thus, the involvement of local private entities in investment activities in the transport construction sector will contribute to the mitigation of the recessionary gap. The functioning of the mechanism for harmonizing the interests of stakeholders should be aimed at harmonizing two blocks of issues:

BLOCK I. This block is related to the conditions of investment activities, in particular, specific measures for the construction of transport infrastructure facilities should be determined (quantitative measurement of the expected length of roads of a certain class, special structures, etc.). On the other hand, these measures should be reflected in the financing part. Determine the terms and stages of direct implementation of infrastructure construction measures. Implementation of the project by a private agent with the involvement of its investment potential can contribute to increased savings due to more economical use of materials and increased labor productivity. During the implementation and upon completion of construction, the state's efforts should be aimed at monitoring the planned passage of construction stages and achieving the required level of quality of infrastructure formation. This is necessary because the private investor will focus on the fastest and most economical solution, which, in turn, may lead to disruption of a number of technological operations and a general decrease in the quality of facilities, and this is designed to make state control impossible at this stage.

BLOCK II. Determining the conditions for the return of investment to private agents. Here, the state as a stakeholder formalizes its interests in creating the prerequisites for socio-economic development. And, accordingly, the more significant the external positive effects of creating a transport infrastructure project, the higher the concession payments can be. To implement such impulses, taking into account the specifics of the territories, transport construction should be accompanied by measures to improve the urban environment, expand development and increase the accessibility and availability of transport infrastructure. To this end, organizations implementing an infrastructure project should interact with local authorities on issues of increasing the significance of the transport facility in social terms.

At the end of our study, it is possible to determine the positive effects of the practical implementation of improved mechanisms for ensuring economic growth of regions based on the development of transport infrastructure:

— change in the ratio of the number of enterprises in the regional center and in the rest of the region (reduction of concentration in the capital);

— increase in the number of companies localized in a certain industrial zone on the "periphery" of the region;

— decrease in the specific costs of each enterprise located on the periphery;

– reduction of negative consequences in areas of overconcentration of production while simultaneously reducing it;

– development of production cooperation due to an increase in the number of regional suppliers and contractors;

– increase in the share of meeting the needs of transport construction at the expense of local goods, resources, components;

– increase in industrial production in terms of volume;

– expansion of the range of own products, components, parts, etc., as an element of the country's national security in the field of goods;

– reduction in the physical volume of imports of certain categories of industrial goods;

– increase in the labor intensity and depth of raw material processing;

– growth in private investments (public finances) attracted to the production sector;

– increase in the introduction of innovative equipment and technologies.

CONCLUSIONS

Currently, an active scientific search is underway for tools and mechanisms for ensuring economic growth of regions at the expense of the country's internal forces. Transport infrastructure is considered one of the most important engines. The study:

– theoretical provisions were generalized and practical recommendations were developed for ensuring economic growth of regions based on the development of transport infrastructure;

– the main theoretical concepts of the role of transport infrastructure as a source of regional growth and development were considered and the conditions that must be taken into account for the formation of effective mechanisms for ensuring economic growth of regions based on the development of transport infrastructure were identified and described: the need to take into account the mutual influence of economic systems at different levels; the need to analyze the interrelationships of transport infrastructure and the regional economic system; the need to coordinate the interests of various agents (stakeholders) represented in the region;

– an analysis and generalization of existing approaches to the formation of mechanisms for ensuring growth based on the development of the transport infrastructure of the system was carried out and it was established that they mainly take into account to a small extent the participation and nature of the prevailing organizational and economic relations of the transport infrastructure and the local economic system.

The above-described conditions, in combination with the tasks set and their solution, allowed to improve and form a number of mechanisms that took shape in the concept of improving the mechanisms of economic growth of regions based on the development of transport infrastructure.

The proposed mechanisms can serve as the basis for the development of management decisions that will be different in content (attraction of private or public investments in infrastructure projects;

development of industrial transport or transport infrastructure of final demand; development of the distribution functions of transport infrastructure or transport). interactions that provide integration and cooperative interregional production links) for each individual regional or local economic system, but are united by the goal of ensuring economic growth of regions based on the development of transport infrastructure.

USE OF ARTIFICIAL INTELLIGENCE

The authors of this study state that AI tools were not used as a replacement for critical thinking, expertise, and human evaluation.

During the preparation of this work, the authors used Chat GPT (Chat GPT 5.1) for purely mechanical work, editorial assistance: stylistic improvement, grammar, spelling, and translation of sources/references.

The authors carried out a full check of all materials obtained with the participation of AI by: comparing each fragment with primary sources and current scientific literature; manually clarifying terms, definitions, and content in accordance with the research methodology; verifying statistical data, facts, international examples, and regulatory references; ensuring compliance with academic standards, research logic, and the requirements of the target publication.

The use of AI tools did not affect the scientific results, empirical conclusions, statistical models, and research position of the authors.

All key findings, conceptual models, methodological positions and recommendations of the study are formulated solely by the authors and reflect their own scientific position.

After using this tool/service, the authors reviewed and edited the content of the work and bear full responsibility for the content of the published article.

CONFLICT OF INTEREST

There is no conflict of interest. The authors declare that they have no financial, academic, personal or other conflicts of interest that could influence the content, results or interpretation of this study.

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