

Improvement Of The Economic Mechanisms Of Diversification Of Construction Industry Enterprises

Yembergenova Aynur Aydosbaevna

Leading Specialist at the State Unitary Enterprise “Center for Comprehensive Expertise of Projects and Import Contracts” under the Ministry of Economy and Finance of the Republic of Uzbekistan

Abstract

The article examines the improvement of economic mechanisms for diversification of construction industry enterprises in the context of structural transformation, market volatility, technological renewal and increasing requirements for economic sustainability. The construction industry is one of the key sectors of the national economy, as it affects investment activity, industrial production, employment, infrastructure development and the reproduction of fixed capital. However, construction industry enterprises are exposed to market risks, resource constraints, dependence on limited product groups and insufficient integration within the value chain. Therefore, diversification should be interpreted not only as an expansion of product assortment but also as a complex economic mechanism that includes product, market, financial and labour resource diversification. The methodological basis of the article includes terminological analysis, factor analysis, SWOT analysis, expert assessment, survey method, correlation-regression analysis, economic-mathematical modelling, systemic and probabilistic-adaptive approaches. The article proposes the use of the Herfindahl–Hirschman Index and the diversification integral index for assessing the diversification level of construction industry enterprises. The findings indicate that integrated diversification assessment makes it possible to classify enterprises into high, stable, medium, risky and highly risky groups. The article also substantiates the importance of construction industry clusters based on the value chain from raw materials and building materials production to design, construction, sale and service infrastructure. The proposed approach contributes to strengthening

competitiveness, reducing risks and improving the long-term economic sustainability of construction industry enterprises.

Keywords: Construction industry, enterprise diversification, economic mechanism, diversification integral index, Herfindahl–Hirschman Index, product diversification, market diversification, financial diversification, labour resource diversification, construction cluster, value chain, economic sustainability.

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Introduction

In modern economic conditions, construction industry enterprises operate in an environment characterized by increasing competition, unstable demand, resource limitations, technological renewal requirements and growing pressure to improve economic efficiency. The construction industry has a special role in national economic development because it creates fixed capital, supports industrial modernization, stimulates demand for building materials and generates multiplier effects across related sectors. Therefore, the sustainable development of construction industry enterprises is not only a sectoral issue but also a strategic factor of national economic growth.

According to the dissertation abstract, the construction sector in Uzbekistan has demonstrated significant growth over the last decade. In particular, the volume of construction works increased from 25,423.1 billion soums in 2015 to 263,679.2 billion soums in 2024. During the same period, gross domestic product increased from 227,761.6 billion soums to 1,283,346 billion soums, while industrial output increased from 97,598.2 billion soums to 880,198.5 billion soums. These dynamics show that construction is one of the most rapidly expanding sectors of the economy. However, quantitative growth alone does not guarantee structural stability, competitiveness or long-term efficiency. The rapid expansion of construction activity may also increase dependence on limited markets, traditional technologies, unstable resource supply and insufficiently diversified business models.

In this regard, diversification becomes a key strategic mechanism for construction industry enterprises. In a narrow sense, diversification means expanding the range of products and services. However, in the context of construction industry development, this interpretation is insufficient. Diversification should be considered as a complex economic mechanism that includes the reallocation of resources, expansion of market segments, reduction of business risks, development of new

financial sources, improvement of labour resource potential and integration into higher value-added chains.

The relevance of the topic is also determined by the fact that construction industry enterprises are closely connected with other sectors of the economy. They consume products of the building materials industry, metallurgy, energy, transport, machinery, design organizations and financial institutions. Therefore, diversification in this sector has a systemic character. It affects not only the internal structure of enterprises but also intersectoral cooperation, investment efficiency, technological modernization and regional industrial development.

The scientific problem addressed in this article is the insufficient development of integrated economic mechanisms for assessing and managing diversification in construction industry enterprises. Existing approaches often evaluate diversification through product assortment or market expansion. However, the dissertation abstract substantiates the need to assess diversification through an integrated system of product, market, financial and labour resource indicators. Such an approach makes it possible to identify the real diversification level of enterprises and to develop targeted management decisions.

The purpose of this article is to develop a scientific and methodological basis for improving the economic mechanisms of diversification of construction industry enterprises by using an integrated diversification index, econometric modelling and a cluster-based value chain approach.

Literature Review

The scientific interpretation of diversification has developed in several directions in the works of CIS and Uzbek scholars. In the CIS literature, diversification is mainly considered as a strategic mechanism for expanding enterprise activity, reducing risks, increasing competitiveness and ensuring sustainable industrial development. G. Nemchenko and co-authors studied production diversification as a process of changing enterprise activity directions and adapting production structures to market conditions. Their approach is important because it connects diversification with the transformation of production potential.

A.M. Prokhorov's encyclopedic interpretation emphasizes diversification as the expansion and multiplication of activities. This approach is conceptually broad and useful for defining the general meaning of diversification, but it does not provide a specific methodology for assessing diversification in construction industry enterprises. Yu.V. Kovets considered economic cycles, crises and forecasts, which is relevant for diversification because construction enterprises are highly sensitive to cyclical fluctuations. From this perspective, diversification can be

interpreted as a mechanism for reducing the negative impact of market cycles.

A.P. Petrov and A.M. Aronov studied diversification in relation to strategic planning and development strategy. Their approach is particularly important for construction industry enterprises because diversification requires not only operational decisions but also long-term strategic resource allocation. G.L. Bagiev linked diversification with marketing activity and market adaptation. This approach is relevant to market diversification, since construction enterprises need to expand their customer segments, regional markets and service directions.

I.N. Gerchikova considered diversification within the framework of enterprise management. Her approach is significant because diversification is treated not only as an economic category but also as a managerial process. N.N. Masyuk's concept of integrated adaptive organization is close to the systemic interpretation of diversification, because construction enterprises must adapt simultaneously to technological, market and resource changes.

Table 1.

Scientific approaches of CIS and Uzbek scholars to enterprise diversification and construction industry development

Author or group of authors	Research focus	Main scientific approach	Relevance to construction industry enterprise diversification	Limitation or research gap
G. Nemchenko and co-authors	Production diversification	Diversification as expansion and restructuring of production activity	Helps explain changes in production directions of construction enterprises	Does not offer an integrated quantitative index for construction enterprises
A.M. Aronov and A.P. Petrov	Diversification theory and development strategy	Diversification as a strategic development process	Relevant for long-term planning of construction industry enterprises	Limited attention to sector-specific indicators
G.L. Bagiev	Marketing activity of enterprises	Diversification as expansion of enterprise activity and product nomenclature	Important for market diversification and customer segment expansion	Market focus is stronger than financial and labour resource analysis
I.N. Gerchikova	Enterprise management	Diversification as part of managerial decision-making	Useful for treating diversification as a management process	Does not fully specify construction industry features
A.V. Bukhvalov and V.S. Katkalo	Modern diversification strategies	Diversification as a strategic corporate development tool	Supports the interpretation of diversification as a competitiveness factor	Requires adaptation to construction industry value chains

E.S. Shaykhov	Organizational-economic mechanism of diversification	Diversification as an economic and organizational mechanism	Directly relevant to the improvement of economic mechanisms	Does not sufficiently integrate product, market, financial and labour indicators
I.D. Kurakov	Diversification of construction enterprises	Sectoral approach to construction enterprise diversification	Highly relevant to construction industry enterprises	Requires further development of quantitative assessment tools
M.Yu. Kuznetsova	Diversification of investment-construction organizations	Diversification through investment and construction activity expansion	Relevant for investment and market diversification	Limited emphasis on integral index formation
N.S. Teslya	Economic potential of construction enterprises	Diversification as a factor of economic potential formation	Useful for linking diversification with enterprise capacity	Does not fully classify diversification levels
O.A. Luzgina and M.G. Kuzmina	Diversification management in industrial enterprises	Management models of industrial diversification	Provides methodological basis for diversification management	Needs adaptation to construction industry cluster structures
R.I. Nurimbetov	Investment in building materials industry	Investment as a factor of industrial production development	Relevant to financial diversification and modernization	Less attention to market and labour resource diversification
A.D. Metyakubov	Investment attraction in building materials industry	Investment mechanism for industrial development	Supports the financial component of diversification	Does not provide a complete diversification assessment scale

K.Sh. Maraimova	Product diversification in construction-industrial enterprises	Product diversification as a factor of enterprise development	Directly relevant to product diversification assessment	Needs integration with market, financial and labour indicators
U.R. Uzakova	Development mechanism of building materials enterprises	Economic mechanism of enterprise development	Relevant to institutional and economic mechanism formation	Does not fully develop diversification index methodology
B. Ruzmetov, Sh. Ruzmetov, Sh. Bakhtiyarov, Z. Dzhumaeva, Kh. Juraev	Regional industrial diversification	Diversification as a basis for regional production growth	Relevant to cluster and regional diversification policy	Needs further connection with enterprise-level integral assessment
M.Q. Pardayev and co-authors	Modernization, diversification and innovation	Diversification as a factor of economic growth	Important for linking diversification with innovation and modernization	Requires sector-specific application to construction industry enterprises

A.V. Bukhvalov and V.S. Katkalo analysed modern interpretations of diversification strategies and emphasized the relationship between diversification, strategy and corporate development. Their approach is relevant for understanding diversification as a strategic mechanism rather than a simple expansion of production. E.S. Shaykhov studied organizational-economic mechanisms of diversification in modern economic conditions. This direction is especially important for the present article because the focus is not only on diversification itself but also on its economic mechanism.

I.D. Kurakov and M.Yu. Kuznetsova directly studied the diversification of construction and investment-construction organizations. Their works are particularly relevant to the construction sector because they connect diversification with construction enterprise development, investment activity and changes in organizational structure. N.S. Teslya examined the formation of the economic potential of construction enterprises under diversification conditions. This approach is important for assessing diversification as a factor of resource potential growth. M.G. Kuzmina and O.A. Luzgina studied diversification management models in industrial enterprises, which provides a methodological basis for analysing diversification as a controlled process. Uzbek scholars have also made important contributions to the study of construction industry development, modernization and diversification. R.I. Nurimbetov analysed the role of investment in the development of the building materials industry. His approach is relevant because diversification in construction industry enterprises depends on investment resources and technological modernization. A.D. Metyakubov studied the attraction of investment in the building materials industry of Uzbekistan, which is directly related to financial diversification and the strengthening of enterprise resource capacity.

K.Sh. Maraimova emphasized the importance of product diversification in construction-industrial enterprises. Her approach is especially relevant to the product component of the diversification integral index. U.R. Uzakova studied the content and essence of the mechanism for developing building materials industry enterprises, which is important for understanding the institutional and economic basis of enterprise development. Sha.Z. Igamova analysed development trends in the building materials industry of Uzbekistan, which is useful for identifying sectoral conditions of diversification.

B. Ruzmetov, Sh. Ruzmetov, Sh. Bakhtiyarov, Z. Dzhumaeva and Kh. Juraev studied the formation of support points for production growth based on regional industrial diversification. Their approach is important for connecting diversification with regional industrial policy and cluster development. E. Yakubova examined regional characteristics of diversification and specialization of industry, which is relevant for adapting diversification

mechanisms to territorial conditions. M. Olimov studied the main aspects of production diversification in industrial enterprises, while M.Q. Pardayev and co-authors linked modernization, diversification and innovation as important factors of economic growth.

The literature review shows that CIS and Uzbek scholars have studied diversification from different perspectives: production expansion, risk reduction, strategic planning, investment development, market adaptation, industrial modernization and regional growth. However, the existing literature does not sufficiently develop an integrated methodology for assessing diversification in construction industry enterprises through product, market, financial and labour resource diversification indicators. This gap justifies the need for a comprehensive economic mechanism based on the diversification integral index, econometric modelling and cluster-based value chain development.

Materials and Methods

The methodological basis of the article is formed by a combination of qualitative, quantitative and systemic research methods. Terminological analysis was used to clarify the economic essence of diversification and to distinguish it from related concepts such as specialization, modernization, innovation and integration. Factor analysis was applied to identify the main determinants of diversification in construction industry enterprises, including product structure, market coverage, financial sources, labour resource potential, investment activity and technological renewal.

SWOT analysis is appropriate for identifying the strengths, weaknesses, opportunities and threats of construction industry enterprises in the process of diversification. Expert assessment and survey methods allow researchers to evaluate the practical significance of diversification factors, especially in cases where statistical data are limited or enterprise-specific information is required. Correlation-regression analysis and economic-mathematical modelling are used to assess the relationship between diversification and the development indicators of the construction sector. The systemic approach makes it possible to examine diversification as a complex process involving production, finance, labour resources, markets and institutional conditions. The probabilistic-adaptive approach is relevant because construction industry enterprises operate under uncertainty, and diversification decisions must be adapted to changing market conditions.

The methodological core of the article is the assessment of diversification using the Herfindahl–Hirschman Index. The index is expressed as follows:

$$HHI = \sum si^2$$

where si is the share of each segment.

To transform the concentration measure into a diversification score on a 0–100 scale, the following formula is used:

$$D = ((1 - HHI) / (1 - 1/n)) \times 100$$

where n is the number of segments.

The logic of this formula is that a higher concentration of activity in one segment indicates lower diversification, while a more balanced distribution across segments indicates higher diversification. Therefore, the diversification index allows researchers and managers to assess how evenly an enterprise distributes its activity across different product groups, market segments, financial sources or labour resource categories.

The integral diversification index is calculated as the arithmetic mean of four diversification components:

$$D_{ik} = (D_p + D_m + D_f + D_l) / 4$$

where D_{ik} is the diversification integral index, D_p is product diversification, D_m is market diversification, D_f is financial diversification, and D_l is labour resource diversification.

According to the dissertation abstract, the diversification level of construction industry enterprises can be classified as follows: high level if $100 \leq D_{ik} \leq 80$, stable level if $79.9 \leq D_{ik} \leq 65$, medium level if $64.9 \leq D_{ik} \leq 50$, risky level if $49.9 \leq D_{ik} \leq 35$, and highly risky level if $34.9 \leq D_{ik} \leq 0$. This classification provides a practical tool for diagnosing the diversification position of enterprises and for developing targeted management measures.

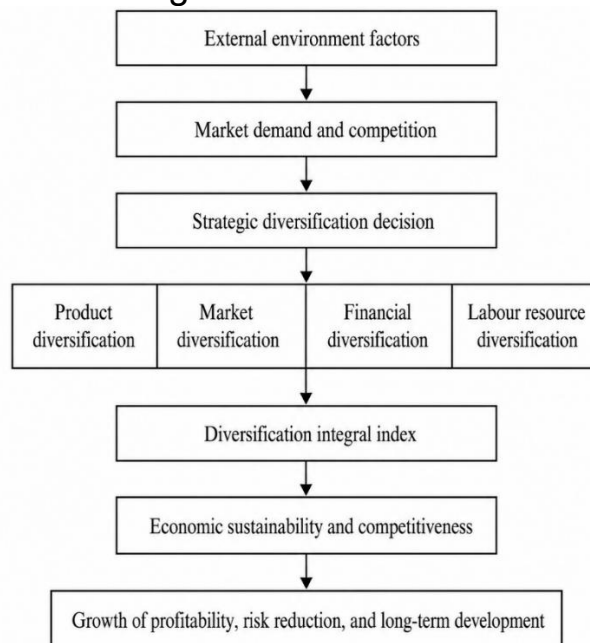


Figure 1. Economic mechanism for diversification of construction industry enterprises

This mechanism shows that diversification begins with the influence of the external environment, including market demand, competition, resource limitations, investment conditions and technological changes. These factors require the enterprise to make a strategic diversification decision. The decision is implemented through product, market, financial and labour resource diversification. The diversification integral index then provides a quantitative basis for assessing the level of diversification and its impact on

economic sustainability. As a result, enterprises may reduce risks, improve profitability and strengthen long-term competitiveness.

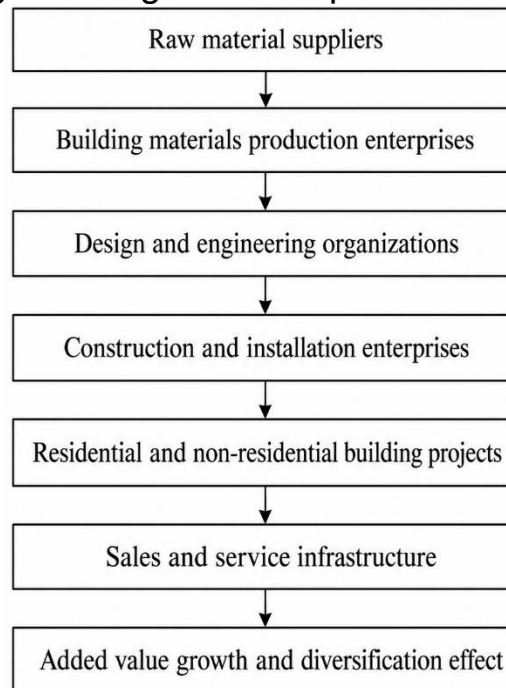


Figure 2. Construction industry cluster model based on the value chain

The cluster model strengthens diversification by integrating different participants of the construction industry into a single value chain. Raw material suppliers, building materials producers, design organizations, construction companies and sales infrastructure become interconnected. This creates synergy, reduces transaction costs, improves resource efficiency and increases the ability of enterprises to participate in higher value-added activities. According to the dissertation abstract, the cluster approach can contribute to increasing net profit in the value chain, which confirms its practical importance for construction industry enterprises.

Results

The results of the study show that diversification of construction industry enterprises should be assessed as an integrated economic process. It cannot be limited to product assortment expansion, because construction industry enterprises are affected by market conditions, investment opportunities, labour resource potential, technological development and intersectoral cooperation. Therefore, the diversification mechanism should include several interconnected components.

First, product diversification determines the enterprise's ability to produce different types of construction materials, components, structures or related products. A diversified product structure reduces dependence on a single product group and allows enterprises to adapt to changes in demand.

Second, market diversification reflects the ability of enterprises to work with different customer groups, regional markets and construction segments. This

component is important because construction demand may vary by region, type of project, investment cycle and public procurement policy.

Third, financial diversification characterizes the structure of financial sources used by the enterprise. Construction industry enterprises require significant investment, and dependence on a single financial source increases vulnerability. Diversification of financing through own funds, loans, investment resources, public-private partnership mechanisms and reinvested profits strengthens economic stability.

Fourth, labour resource diversification reflects the availability of qualified personnel in different functional and technological areas. In modern construction industry enterprises, engineers, technologists, financial analysts, marketing specialists, project managers and innovation-oriented personnel are all necessary for successful diversification.

The diversification integral index combines these four components into one analytical measure. This is important because separate indicators may show different results. For example, an enterprise may have a diversified product structure but weak financial diversification. Another enterprise may have strong financial resources but limited market diversification. The integral index makes it possible to evaluate the overall diversification level and classify enterprises into high, stable, medium, risky and highly risky groups. The dissertation abstract also shows that diversification assessment can be linked with economic-mathematical and multifactor econometric modelling. Such modelling makes it possible to forecast the development of the construction sector up to 2032 and to identify the impact of key factors on construction industry growth. Although exact model coefficients are not reproduced here, the methodological significance lies in the fact that diversification is connected with long-term sectoral forecasting.

Another important result is the justification of construction industry clusters. The proposed cluster model is based on the value chain from raw material supply and building materials production to design, construction, sale and service infrastructure. This approach transforms diversification from an internal enterprise strategy into a regional and sectoral development mechanism. According to the dissertation abstract, the implementation of such a cluster approach may contribute to increasing net profit in the value chain.

Discussion

The findings confirm that diversification in construction industry enterprises should be understood as a strategic economic mechanism rather than only as the expansion of product assortment. This interpretation is consistent with the approaches of CIS scholars who considered diversification as a tool of risk reduction, strategic development and enterprise adaptation. However, the proposed approach develops these views further by integrating product,

market, financial and labour resource diversification into a single analytical model.

Compared with the approaches of G. Nemchenko and A.M. Aronov, the present study places stronger emphasis on the quantitative assessment of diversification. While earlier approaches explain the general logic of production expansion and strategic development, the diversification integral index provides a more practical diagnostic tool. Compared with G.L. Bagiev's marketing-oriented interpretation, the proposed mechanism includes not only market expansion but also financial and labour resource diversification. This is especially important for construction industry enterprises, where market expansion alone cannot guarantee sustainability without financial capacity and qualified personnel.

The works of I.D. Kurakov, M.Yu. Kuznetsova and N.S. Teslya are directly relevant to construction enterprises. They show that diversification is connected with investment-construction activity and the formation of enterprise economic potential. However, the methodology proposed in this article provides a clearer classification of diversification levels through quantitative boundaries. This makes it possible to identify whether an enterprise is in a high, stable, medium, risky or highly risky diversification position.

Uzbek scholars have made important contributions to the study of construction industry development. R.I. Nurimbetov and A.D. Metyakubov emphasized the role of investment in the development of building materials production. Their approaches support the financial diversification component of the proposed model. K.Sh. Maraimova's research on product diversification in construction-industrial enterprises corresponds to the product component of the diversification integral index. U.R. Uzakova's work on the mechanism of development of building materials enterprises is important for understanding the institutional basis of diversification. The studies of B. Ruzmetov and co-authors are especially relevant to cluster development and regional diversification.

The main advantage of the proposed approach is that it combines enterprise-level assessment with sector-level development mechanisms. The diversification integral index helps diagnose the internal diversification level of enterprises, while the construction industry cluster model shows how diversification can be expanded through value chain integration. This dual approach is particularly important for Uzbekistan, where the construction sector has demonstrated rapid growth but still requires structural improvement, technological modernization and stronger integration among related industries.

At the same time, several methodological limitations should be acknowledged. First, the diversification integral index depends on the quality and completeness of enterprise-level data. Second, the HHI-based formula

measures distribution across segments but does not directly measure profitability, innovation quality or technological complexity. Third, the classification thresholds require practical testing across a larger number of construction industry enterprises. Fourth, the econometric forecast up to 2032 should be periodically updated as new statistical data become available.

Despite these limitations, the proposed mechanism has significant scientific and practical value. It allows policymakers, industry managers and researchers to evaluate diversification more systematically and to design economic measures aimed at strengthening the competitiveness and stability of construction industry enterprises.

Conclusion

The article substantiates that diversification is one of the key economic mechanisms for improving the sustainability and competitiveness of construction industry enterprises. The theoretical conclusion is that diversification should be understood not only as product expansion but also as a multidimensional economic process involving product, market, financial and labour resource components.

The methodological conclusion is that the diversification integral index provides a practical tool for assessing the diversification level of construction industry enterprises. The use of the Herfindahl–Hirschman Index allows the degree of concentration or diversification in each component to be measured, while the integral index combines these components into a unified diagnostic indicator. The classification of enterprises into high, stable, medium, risky and highly risky groups can serve as a basis for differentiated management decisions.

The practical conclusion is that construction industry enterprises should develop diversification strategies based on their internal resources, market opportunities, financial capacity and labour potential. Enterprises with risky or highly risky diversification levels should expand their product range, enter new market segments, diversify financing sources and strengthen the qualification structure of personnel. Enterprises with stable or high diversification levels should focus on innovation, technological modernization and participation in cluster-based value chains.

From the policy perspective, the development of construction industry clusters is an important direction for improving diversification. Such clusters can integrate raw material suppliers, building materials producers, design organizations, construction companies, sales infrastructure and service organizations. This integration increases added value, improves resource efficiency and strengthens the economic sustainability of enterprises.

For construction industry enterprises, the following recommendations can be proposed: regularly calculate the diversification integral index; monitor product, market, financial and labour resource diversification separately; use

econometric forecasting in strategic planning; expand cooperation with suppliers, design organizations and construction companies; and participate in regional construction industry clusters.

Future research should focus on testing the proposed diversification integral index using a larger sample of construction industry enterprises, improving the weighting system of diversification components, assessing the relationship between diversification and profitability, and developing digital monitoring tools for diversification management.

Overall, the improvement of economic mechanisms of diversification of construction industry enterprises is a scientifically relevant and practically significant direction. It contributes to risk reduction, profitability growth, competitiveness enhancement, value chain integration and long-term sustainable development of the construction sector.

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