

UDC 332.83[035.3]

Obukhov R.V. ■

Ensuring competitiveness of enterprises in the construction industry on the basis of dynamic equilibrium concept

Relevance of research. Research shows that a special place in the modern turbulent economy is occupied by the problems of developing the theory and practice of modelling the competitiveness of construction enterprises from the standpoint of assessment and integrated management of both its current, medium-term, and strategic competitiveness through a conceptual mechanism of dynamic equilibrium of the internal and external environment in conditions of uncertainty and risk.

Purpose of the study. To substantiate methodological approaches to ensure the processes of assessing and managing the competitiveness of construction enterprises based on the concept of dynamic equilibrium of the internal and external environment in conditions of risk and uncertainty through modelling the aggregate competitive potential for key success factors.

Methods. A set of systemically interrelated methodological approaches based on both the theory of competitiveness and the concept of dynamic equilibrium of economic systems was used. The methods of factor and trend analysis, mathematical statistics, economic and mathematical modelling and forecasting, expert assessments, uncertainty and risk theory, comparison, analysis and synthesis were also used.

Results and novelty. The article demonstrates the following main scientific results with elements of scientific novelty: clarification of the conceptual category "competitiveness" with the definition of a set of system principles for modelling and situational assessment of competitiveness using an indicative sector program; the concept of dynamic equilibrium of competitiveness for construction enterprises in the areas of productivity and cost management is modeled with the development of the conceptual category "uncertainty". A generalized classification and analysis of key success factors determining competitiveness based on the structuring of local potentials of investment, organizational, production, and financial and economic types has been performed; a methodological approach has been developed to determine calculated indicators of enterprise competitiveness; the main patterns of change in key factors of competitiveness management at the operational, tactical, and strategic management levels have been established using the example of Tunnel-2001 LLC's competitive profile.

Keywords: *aggregate competitiveness, potential competitiveness, internal competitiveness assessment, management, construction company, uncertainty, dynamic equilibrium concept, internal environment, external environment, key success factors*



Obukhov Roman Vladimirovich,

Postgraduate student of the Department of Economics and Management in Construction; Moscow State University of Civil Engineering (National Research University) (MGSU); 26 Yaroslavskoe shosse, Moscow, 129337, Russian Federation; AuthorID: 865288, SPIN-code: 7149-0013; romanob@yandex.ru

INTRODUCTION

A promising area of scientific and practical development of regional construction markets is the formation of competitive and high-performance construction and economic systems.

The analysis of the national construction market shows that the issue of competitiveness is especially relevant from the perspective of the modern turbulent economy, which creates critical levels of uncertainty for all enterprises of the construction complex and generates increased risks of loss of their competitiveness.

Most construction companies are characterized by a problematic situation of significant risks of losing their current operational competitiveness due to significant threats to reduce their overall competitive potential in the medium and strategic term.

The author's research shows that there are gaps between the current and potential competitiveness of a construction company in a highly uncertain business environment. An increase in the key interest rate, inflation, adjustments to government procurement conditions, continued sanctions, insufficient staffing, low direct investment in the renovation of fixed assets, etc. have a significant impact on dynamic changes in the external environment.

A large number of scientific works by well-known foreign and domestic economists are devoted to the issues of formation, assessment and management of competitiveness of enterprises, which affect both the meaning of the concept itself and the methods of their quantitative and qualitative assessment. Thus, Professor Kh.M. Gumba [1] notes the importance of modelling the conceptual foundations of the formation of sustainable competitive advantages.

A significant contribution to the theory of competitiveness was made by Professor I.G. Lukmanova, who thoroughly studied this topic from the perspective of construction industry enterprises [2], customer orientation as a reserve for increasing competitiveness [3], in the context of the development of self-regulation processes [4], as well as in the framework of competitiveness analysis from the perspective of ensuring strategic advantages of the enterprise [5].

A study by Prof. N.Yu. Yaskova, V.I. Sarchenko and S.A. Khirevich, who predict the horizons of competitiveness of the national economy [6], model an integrated approach to the formation of a high-quality competitive urban environment [7].

Noteworthy are the author's studies on the competitiveness of development companies by S.M. Borozdina, PhD in Economics, in which she models

► the conceptual mechanisms of enterprise competitiveness in the construction industry and marketing strategies [8].

Some issues in the field of modelling the competitiveness of construction organizations were considered by Professor P.G. Grabovyy [9], including the issues of risks and uncertainty [10], as well as Prof. A.N. Larionov and Prof. V.A. Kosheev [11].

A number of authors, such as Kh.M. Gumba, S.S. Uvarova, S.V. Belyaeva, etc., explore the topical issues of forming the concept of systemic competitiveness of construction in the digital economy [12]. D.N. Silka analyzed the factors of business activity that determine the competitiveness of construction [13], and K.A. Babenchuk — competitiveness management of the regional housing market in Samara [14].

A number of studies on the competitiveness of regional business systems and leading companies in the primary market, conducted under the guidance of Prof. S.A. Baronin [15, 16].

The review analysis shows that despite significant research in this area, a very relevant problem of the development of the theory and practice of modelling the competitive potential of construction enterprises from the perspective of applying the concept of dynamic equilibrium of the internal and external environment in conditions of uncertainty of a turbulent economy remains unresolved.

In this regard, recent research in the field of modelling the dynamic equilibrium of economic systems by such authors as G.A. Batishchev, M.I. Zhuravleva [17, 18], as well as M.S. Melnik on the structural and dynamic equilibrium of socio-economic systems [19] and O.E. Kichigin [20] on the dynamic equilibrium of regional and corporate structures of the fuel and energy complex. But at the same time, the problem of applying the concept of dynamic equilibrium to the theory of competitiveness of construction enterprises is not investigated and is open.

Also, an additional analysis of research in the field of regional economics shows that a research approach is becoming more widespread, where risk theory does not dominate, but is significantly complemented by uncertainty theory.

Most researchers interpret the concept of economic uncertainty according to F. Knight sees the uncertainty of the future outcome of the event, as well as its poor predictability due to the inability to predict it based on current information. The translation of the fundamental work "Risk, Uncertainty and Profit" [21] by the American economist Frank Heineman Knight, first published in Russian in 2003, made it possible to identify uncertainty as a decisive factor in the emergence of the phenomenon of entrepreneurial profit.

The problem of uncertainty is manifested in various studies of scientists. The research of A.K. Orlov in terms of forecasting the cost of basic building materials in conditions of uncertainty deserves attention [22].

D.A. Petrova in his work also suggests assessing the level of uncertainty of economic policy [23]. When modelling the processes of assessing the competitive advantages of construction enterprises, as R.V. Obukhov points out [24], it is also necessary to take into account uncertainty when analyzing the factor space.

It is also important to take into account both the theory of life cycles in construction [25] and the concept of sustainable development of territories and green construction [26, 27], eco-oriented development [28] and the model of harmonization of construction [29].

Thus, the conducted review analysis confirmed the relevance of research on the issues of ensuring the competitiveness of enterprises in the construction industry based on the concept of dynamic equilibrium and the theory of uncertainty in a turbulent economy.

The problem under study allowed us to formulate a *scientific hypothesis* of the study. It consists in the assumption that the implementation in modern conditions of methodological provisions and practical recommendations for the development of the theory of competitiveness of construction enterprises is possible through the application of the concept of dynamic equilibrium of the internal and external environment at the current, tactical and strategic management level through modelling the aggregate competitive potential for key success factors in conditions of high uncertainty.

Construction companies operating as a competitive business environment in a turbulent economy, increased risks and uncertainty are accepted as the *object of research*.

The *subject of the research* is the category of competitiveness of a construction company and the key success factors that form the overall competitive potential at the operational, tactical and strategic management levels.

The *purpose of the study* is to substantiate methodological approaches and practical recommendations for ensuring the competitiveness of construction enterprises based on the concept of dynamic balance of the internal and external environment in conditions of risk and uncertainty through modelling the aggregate competitive potential for key success factors at the strategic, tactical and operational management levels.

METHODOLOGY

At the methodological stage of the research, the following set of methodological developments was carried out:

First, the conceptual category "total competitiveness" of a construction company is defined. It is understood as the integral and sustainable ability of investment, organizational, production, and financial and economic potentials, considered as key success factors, to make high-performance use of all types of production and economic resources while ensuring compliance with industry standards and principles of competition with major competitors and a business leader at the operational, tactical, and strategic management levels, provided that uncertainties and risks of the internal and external environment.

Secondly, a theoretical approach has been developed to determine the methodological foundations for modelling indicators of aggregate competitiveness (C_i), based on the following principles of indicative modelling:

- the formation of three local types of competitive potential as the basis for the indicator assessment of C_i : investment — Z_1 ; organizational and production — Z_2 ; financial and economic — Z_3 , which determine the aggregate (total) potential of Z_0 ;
- the principle of modelling local competitive potentials based on the identification and analysis of *key success factors* (KSF) as the main determinants or goals of C_i in the framework of the functioning of Z_1 – Z_3 in the areas of performance and cost management. Initially, experts selected 60 factors as the basis of the KSF study. Then, during the expert survey, the final significant factor space of KSF was formed from 25 factors with the coefficients of their weight α_i and the weight of local potentials λ_i ;
- the principle of ensuring compliance of KSF indicators with industry-specific production and economic norms and standards. This determines the modelling of the internal competitiveness of the operational type — C_i , as well as the possible managerial C_i in the presence of an internal corporate planning and controlling system for this indicator — C_{M_i} ;

- the principle of competition (competitiveness) with the main competitors through the level of compliance of KSF indicators of the analyzed enterprise with the indicators of the main competitors. This determines the modelling of the potential competitiveness of the tactical type — C_T ;
- the principle of competition with the main business leader within the framework of the benchmarking concept is through the level of compliance of KSF indicators of the analyzed enterprise with the indicators of the industry business leader. This determines the modelling of potential competitiveness of a strategic or reference type — C_S ;
- the principle of distinguishing internal C_i at the operational level and external potential at the tactical and strategic (reference) level;
- the principle of modelling the total (general) competitiveness C_G of a joint venture as an integral indicator depending on the indices of operational, tactical and strategic C_i ;
- the principle of preferential stability for an average type of enterprise according to indicators of operational C_i and worse indicators at the current and strategic level;
- the principle of the need to identify gaps between the current operational, tactical and strategic C_i , ensuring their minimization and management stabilization through the use of the concept of dynamic balance of the internal and external environment;
- the principle of ensuring dynamic equilibrium of Q_i and V_j as a conceptual basis for the management stabilization of C_i in conditions of uncertainty and risk according to significant indicators of KSF.

Thirdly, the author's research [30, 31] allowed us to propose the following understanding of the conceptual category of the dynamic equilibrium concept (DR_{q-v}), which should be understood as a theoretical approach to modelling the abilities of development systems to consistently identify, to restore and stabilize the losses of lost competitiveness to an acceptable level by ensuring a continuous dynamic balance of the external and internal environment through performance and cost management based on key success factors in conditions of constant uncertainty and risks.

Fourth, methodological modelling of the indicators of the total (general) competitiveness C_G through two subsystems has been carried out:

- *internal* — C_i : operational type, based on the principle of comparability of actual C_i indicators with industry standards or internal corporate standards (C_{op}); managerial type (C_M), based on the principle of comparability of actual C_i indicators with their planned indicators;
- *external or potential* — C_p , as an ability to compete with a competitive business environment (CBS) and with key business leaders. The following indicators are used to calculate the competitiveness potential;
- *tactical competitiveness* — C_T , as a comparability with the main competitors at KBS;
- *strategic (reference) competitiveness* C_S , as a comparability with an industry leader within the framework of the benchmarking concept.

The performed studies also allowed us to determine the calculation formulas of formulas and indicators of C_i , taking into account the weight of X_i in subsystems Z_1-Z_3 in the factor space KSF.

RESULTS OF THE STUDY

Nomogram of the dynamic equilibrium of construction enterprises in terms of aggregate competitiveness in the areas of productivity and cost management

To implement the accepted theoretical approach, a nomogram of the dynamic equilibrium of construction enterprises for overall competitiveness in the areas of performance management (P_i, R) and cost management (V_b, C) was developed for various levels of uncertainty W_i and five areas of dynamic equilibrium from D_{ab} to D_{cr} shown in Fig. 1.

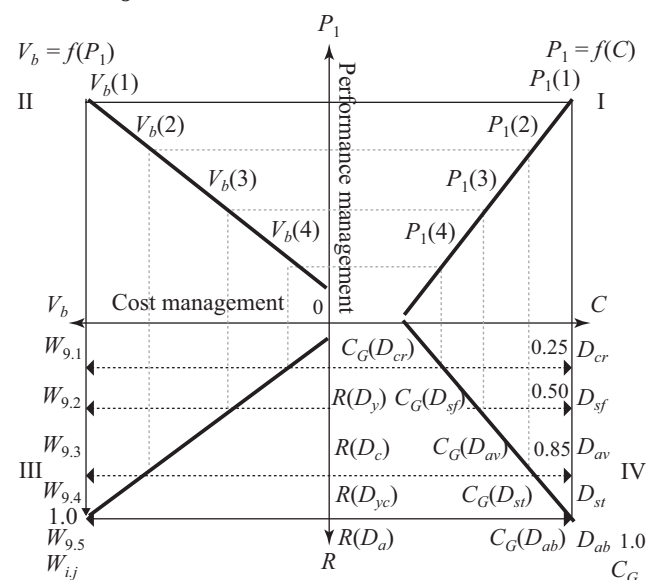


Fig. 1. Nomogram of the dynamic equilibrium of construction enterprises for overall competitiveness in the areas of performance management (P_i, R) and cost management (V_b, C) was developed for various levels of uncertainty W_i and five areas of dynamic equilibrium from D_{ab} to D_{cr}

Where C — invested capital (own and borrowed);
 V_b — business value;
 P_i — labour productivity;
 R — company revenue;
 $V_b = f(P_i)$ — the function of changing the value of a business depending on P_i ;
 $P_i = f(C)$ — the function of changing labour productivity depending on C ;
 $D_{ab}, D_{st}, D_{av}, D_{sf}, D_{cr}$ — zones of dynamic equilibrium of the enterprise in terms of general competitiveness C_G respectively, the absolute $C_G(D_{ab})$, stable $C_G(D_{st})$, average $C_G(D_{av})$, satisfactory $C_G(D_{sf})$ and critical level $C_G(D_{cr})$;
 $W_{9,5}, W_{9,4}, W_{9,3}, W_{9,2}, W_{9,1}$ — areas of uncertainty and risks of competitiveness of enterprises are absolute, discrete, range, critical and total uncertainty, respectively.

Definition of the conceptual category uncertainty, its classification analysis and levels of its modelling

It is proposed to understand the *uncertainty* W_i in relation to C_G as the ability of construction enterprises to uncontrollably increase their instability in terms of competitiveness indicators up to a crisis state. W_i also provides for: the presence of a high intensity of changes in the external and internal environment; unpredictability,

randomness, unreliability and incompleteness of information; unpredictability and non-derivability of a reliable new competitive state from a previously known retrospective period; the presence of deliberate counteraction factors leading to a loss of competitiveness of a construction company, up to its liquidation.

The following classification of uncertainty is proposed according to the following criteria: the external environment of the enterprise (W_1); the internal environment of enterprises (W_2); the subject of management (W_3); the object of management (W_4); the target effectiveness of management (5th kind — W_5); the balance of the internal and external environment (W_6); the choice of alternatives and their multiplicity (W_7); according to the state of the system relative to its "ideal" competitiveness parameters (corporate standards, industry standards, standards of leaders, harmonic ideals) (W_8); according to the levels of uncertainty (W_9).

Within the framework of modelling uncertainty of the 9th kind of type W_9 , it is proposed to identify the following levels of modelling:

First level of uncertainty $W_{9.5}$ — "full certainty of the sustainability of the construction company". The interval — 1.00. It assumes hypothetical complete or deterministic certainty in a predictable, stable and highly stable external and internal environment with a high level of adaptation and flexibility to rare and small changes.

Second level of uncertainty $W_{9.4}$ — "discrete uncertainty of the sustainable development of a construction company with minimal uncertainty". The range is from 1.00 to 0.85. It is characterized by the presence of a number of separate local discrete situations of depreciation of current competitive advantages with the ability to determine the probability of their occurrence and the ability to predict scenarios for the formation of innovative strategic competitive advantages with minimal risks.

Third level of uncertainty $W_{9.3}$ — "range uncertainty of the sustainable development of a construction company C_i with the maximum allowable uncertainty". The range is from 0.84 to 0.51. When frequently recurring discrete situations of increasing uncertainty turn into a stable and continuous manifestation in certain time ranges, the level of uncertainty in the internal and external environment of the enterprise is transformed into a range uncertainty.

Fourth level of uncertainty $W_{9.2}$ — "critical uncertainty of the sustainable development of a construction company with unacceptable critical uncertainty". The range is from 0.50 to 0.25. In this case, a further increase in entropy in uncertainty will lead to its transformation to an unacceptably critical level. This determines the transition to anti-crisis strategies aimed at two alternatives: by moving to zone $W_{9.3}$ or to the liquidation zone.

Fifth level of uncertainty $W_{9.1}$ — "complete uncertainty of the sustainable development of the construction company in terms of competitiveness and its transition to liquidation". The range is from 0.24 to 0. This determines the possibility of implementing only one alternative strategic scenario — the liquidation of the enterprise with the development of optimal liquidation strategies with its maximum liquid value.

The controlled zones should include discrete, range, and critical.

Analysis of key success factors in modelling local competitive potentials of a construction company

The developed principles of C_G research provide for the modelling of the factor space based on KSF. Initially, experts selected 60 factors distributed by types of competitive potentials Z_1 – Z_3 as the KSF research base. Then, during the expert survey, the final

significant factor space KSF was formed from 25 factors with the coefficients of their weight α_i and the weight of local potentials λ_i . The final results of the study are shown in Table.

The study of the main patterns of transformation of local competitive potentials at the operational, tactical and strategic levels of management

The scientific result of the study is in the form of the main patterns of transformation of local competitive potentials at the operational, tactical and strategic management levels using the example of six companies in the Moscow underground construction market: Tunnel-2001 (the main analyzed enterprise); SMU No. 1; SMU No. 6; SMU No. 8; Tunnel Detachment No. 6 and SMU No. 12 for the analyzed period 2019–2023. At the same time, two types of economic trends have been identified:

Firstly, patterns of change in the average indicators of the actual KSF indicators for local competitive potentials over a five-year period have been obtained in the form of a sector diagram shown in Fig. 2.

The sectorogram shows the following values of local competitive potentials at the operational level — 0.937; at the tactical level — 0.904; at the strategic level — 0.719.

Secondly, the main patterns of change in the actual indicators of local competitive potentials Z_1 – Z_3 by the main KSF_{*i*} factors at the operational (o), tactical (t) and strategic (s) levels are determined in the form of a diagram shown in Fig. 3.

The main patterns of transformation of local competitive potentials Z_1 – Z_3 according to the main KSF factors over a five-year period are: a high stable level of internal operational competitiveness at an average level of 0.937; a significant level of tactical competitiveness with an average level of 0.904. In some cases, the indicators are greater than one, which forms tactical leadership zones, shown as ψ_1 (in 2019) and ψ_2 (in 2022). At the same time, the values of Z_1 – Z_3 at the operational and tactical levels are always at a high level of discrete uncertainty in the $W_{9.4}$ zone; the presence of a consistently low level of strategic (reference) competitiveness of local potentials from 0.630 to 0.790 with an average level of 0.719.

All values of $Z_{1,av}$ – $Z_{3,av}$ for the analyzed five-year period are in the range of uncertainty $W_{9.3}$.

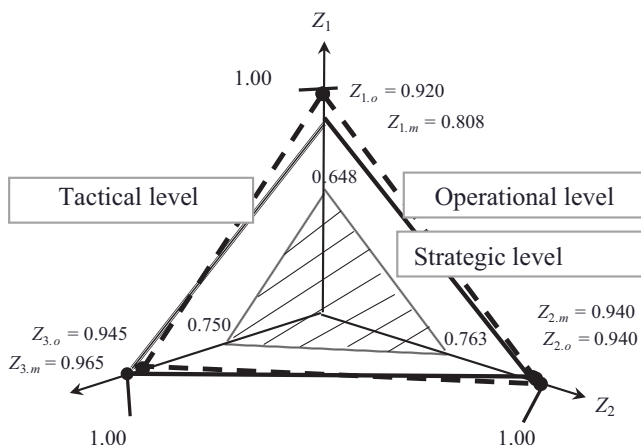


Fig. 2. A model of the sectorogram of actual competitiveness indicators for local competitive potentials Z_1 , Z_2 and Z_3 for "Tunnel-2001" LLC based on average indicators for 2019–2023

The final significant KSF factor space for the three types of competitive potential Z_1-Z_3 and its weight by X_i and subsystems

Key factor		Key X_i at the operational level K_i		Key X_i at the tactical level K_i		Key X_i at the strategic level K_i	
		+/-	Weight of α_i	+/-	Weight of α_i	+/-	Weight of α_i
1. Investment potential (Z_1) — $\lambda_1 = 0.5$							
X_1	Business value	-	-	+	0.45	+	0.45
X_2	Market share size	-	-	+	0.3	+	0.45
X_4	Return on equity	+	0.2	+	0.1	-	-
X_5	Return on borrowed capital	+	0.3	+	0.05	-	-
X_6	Return on investment capital	+	0.4	+	0.1	+	0.1
X_7	Return on production capital	+	0.05	-	-	-	-
X_8	Return on working capital		0.05	-	-	-	-
2. Organizational and production potential (Z_2) — $\lambda_2 = 0.3$							
X_{13}	Labour productivity	+	0.60	+	0.40	+	0.20
X_{14}	The level of concentration of production by volume of construction works	-	-	+	0.10	+	0.10
X_{17}	Fundreturn	+	0.40	-	-	-	-
X_{18}	The level of diversification of production activities	-	-	+	0.05	-	0.10
X_{19}	The level of application of digitalization and high-tech	-	-	+	0.20	+	0.20
X_{21}	Construction works, the degree of participation in government orders and national projects	-	-	+	0.20	+	0.30
X_{24}	Labour potential (average number of employees)	+	-	+	0.05	+	0.10
3. Financial and economic potential (Z_3) — $\lambda_3 = 0.2$							
X_{26}	The ratio of borrowed and own funds	-	-	+	0.15	+	0.15
X_{27}	Maneuverability of own funds	+	0.1	-	-	-	-
X_{28}	Provision of material reserves with own working capital	-	-	+	0.15	+	0.15
X_{29}	Financial stability	+	0.3	+	0.2	+	0.2
X_{30}	Current liquidity	+	0.25	-	-	-	-
X_{31}	Promising liquidity	-	-	-	-	+	0.3
X_{32}	Fast liquidity	-	-	+	0.2	-	-
X_{34}	Availability of own funds	+	0.15	-	-	-	-
X_{51}	Ability to restore solvency	+	0.2	-	-	-	-
X_{53}	Probability of bankruptcy according to the Taffler model	-	-	+	0.3	+	0.2

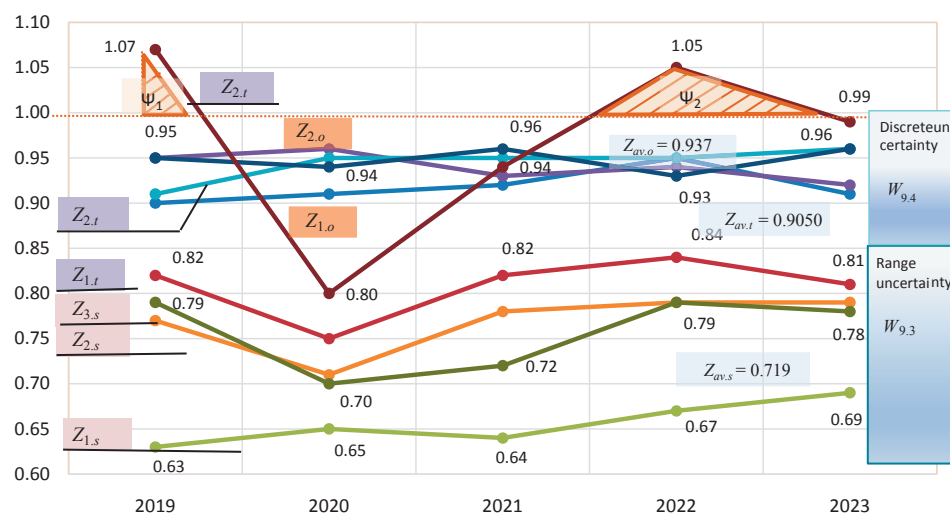


Fig. 3. Trends in the local competitive potentials of Z_1-Z_3 by CFU factors at the operational (o), tactical (t) and strategic (s) management levels of "Tunnel-2001" LLC in 1999-2023

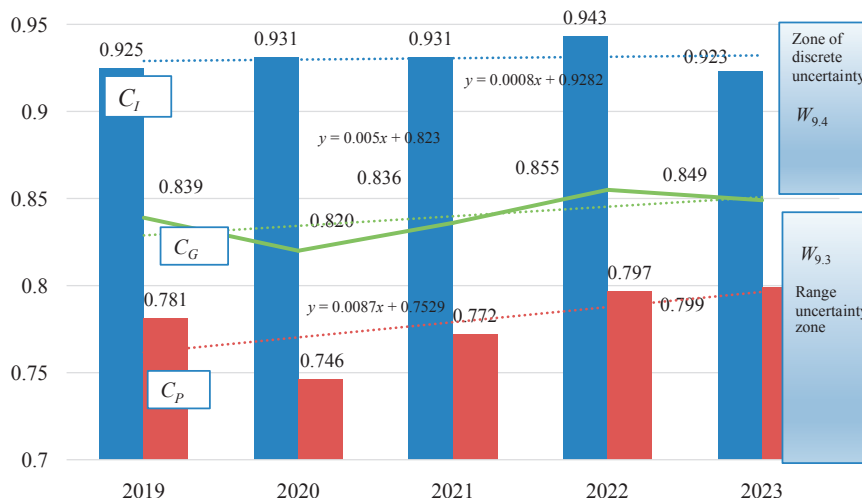


Fig. 4. The main trends in the internal (C_I), prospective (C_P) and general (C_G) competitiveness of Tunnel-2001 LLC in 2019–2023 in relation to the uncertainty zones $W_{9.3}$ and $W_{9.4}$

Analysis of the main trends in the internal, prospective and overall competitiveness of “Tunnel-2001” LLC for 2019–2023 in relation to areas of uncertainty

The approbation of the author’s methodology using the example of the competitive profile of “Tunnel-2001” LLC made it possible to determine the main trends in changes in C_I , C_P and C_G for 2019–2023 in relation to the level of uncertainty W_{ij} shown in Fig. 4. The actual patterns of change in C_I are approximated by linear trends.

It was found that the overall competitiveness C_G of the enterprise during the analyzed period moved from the range $W_{9.3}$ to the zone of discrete uncertainty $W_{9.4}$. This demonstrates the success of the sustainable competitive development of “Tunnel-2001” LLC in 2019–2023. At the same time, internal competitiveness is consistently high at an average level of 0.9306 and is located in the $W_{9.4}$ zone. At the same time, the potential competitiveness C_P over the analyzed period remained in the zone of uncertainty and risks $W_{9.3}$ and is in the range from 0.746 to 0.797 (Fig. 4).

DISCUSSION

Undoubtedly, an attempt to synthesize an indicator of the overall competitiveness of a construction organization based on the principles of dynamic equilibrium in conditions of uncertainty is of scientific and practical interest. But at the same time, when solving the task, a number of controversial issues should be noted.

First, it is necessary to model the processes of ensuring the dynamic competitiveness of construction enterprises, taking into account industry specifics. For example, both underground, residential or industrial construction, as well as other segments of the commodity construction market, require consideration of their specifics. This will undoubtedly require an adjustment of the author’s methodology.

Secondly, the methodology of aggregate competitiveness requires its development from the standpoint of modelling the life cycles of both aggregate and local types of competitiveness of a construction enterprise in the system of internal corporate management.

Thirdly, it is quite obvious that there is a need for additional development of the scientific and practical foundations of state policy in the field of bidding, tenders and auctions when selecting contractors as part of the implementation of government orders in accordance with federal law 44-FZ, taking into account indicators

of aggregate competitiveness according to the author’s methodology.

Fourth, it is important to provide a methodological calculation apparatus for competitiveness with its focus on digital information modelling technologies.

Fifth, the methodology for assessing and managing the dynamic competitiveness of construction enterprises should have a mandatory element at the final calculation stage in the form of determining specific effects and effectiveness by ensuring an increase of C_G .

The above-mentioned number of controversial issues of the methodology should be attributed not so much to the disadvantages, but mainly to the prospects for its development.

CONCLUSIONS

The research carried out on the studied issues actualizes research on the development of the theory of competitiveness of construction enterprises based on the concept of dynamic equilibrium through modelling the aggregate competitive potential for key success factors in conditions of uncertainty and risk.

The non-trivial research field is formed due to the importance of developing exploratory scientific research in the field of applying the concept of dynamic equilibria in the areas of productivity and cost management relative to the competitiveness of a construction company in a turbulent economy and increased uncertainty of the internal and external business environment in terms of factor space in the form of KSF.

The author’s methodological framework for ensuring the competitiveness of a construction company provides for comprehensive C_G modelling, and its approbation using the example of “Tunnel-2001 LLC” for 2019–2023 with the receipt of individual scientific results: a nomogram of dynamic equilibrium; a conceptual definition of the uncertainty category, its classification analysis and allocation of modelling levels; analysis of key success factors in modelling local competitive potentials. The study of the main patterns of transformation of local competitive potentials at the operational, tactical and strategic management levels; the analysis of the main trends in internal, prospective and overall competitiveness in relation to areas of uncertainty.

The author identifies controversial issues and promising research directions for ensuring the overall competitiveness of con-

struction enterprises based on the KSF dynamic equilibrium concept in conditions of uncertainty and risk in a turbulent economy.

REFERENCES

- Gumba Kh.M., Mamaev M.I. Conceptual foundations of the formation of sustainable competitive advantages. *Proceedings of the Irkutsk State Academy of Economics*. 2014; 1:11. EDN RXBVTN. (rus.).
- Lukmanova I.G. Problems of quality assurance and competitiveness of products of construction industry enterprises : abstract of the dissertation of doctor economic sciences. Moscow, Moscow State University of Civil Engineering, 2001. (rus.).
- Lukmanova I.G., Sarchenko V.I., Ladygina E.E. Customer orientation of the enterprise is the most important reserve for increasing competitiveness. *Economics of construction*. 2020; 3(63):24-32. EDN LMANJR. (rus.).
- Lukmanova I.G., Kazinets L.A. Increasing the competitiveness of construction organizations in the context of self-regulation. *Real estate: economics, management*. 2010; 1-2:24-27. EDN MQPNJT. (rus.).
- Yaskova N.Yu., Lukmanova I.G. From competitiveness to strategic advantage of the enterprise. *News of higher educational institutions. Technology of the textile industry*. 2018; 2(374):44-49. EDN LXXTKX. (rus.).
- Yaskova N.Yu., Lukmanova I.G. New horizons of competitiveness of the national economy. *News of higher educational institutions. Technology of the textile industry*. 2019; 2(380):23-28. EDN YTNINT. (rus.).
- Yaskova N.Yu., Sarchenko V.I., Hirevich S.A. An integrated approach to the formation of a high-quality, competitive urban environment. Moscow, Publishing and Trading Corporation Dashkov and K, 2023; 356. DOI: 10.29030/978-5-394-05353-5-2023. EDN WMBBUE. (rus.).
- Borozdina S.M. The management mechanism for ensuring the competitiveness of a development company in the housing real estate market : abstract of the dissertation of the Candidate of Economic Sciences. Moscow, 2017; 24. (rus.).
- Grabovyy P.G., Lunyakov M.A. Performance management in the investment and construction complex: planning, monitoring and level improvement. *Real estate: economics, management*. 2015; 2:11-13. EDN UIOUHP. (rus.).
- Grabovyy P.G., Korolev N.I. Methods for improving the reliability of general contractor project management systems for residential complexes in conditions of risks and uncertainties. *Real estate: economics, management*. 2024; S3:91-94. (rus.).
- Larionov A.N., Prygunov P.I., Kosheev V.A. Methods of improving the competitiveness of an organization. *Bulletin of Civil Engineers*. 2016; 6(59):339-341. EDN XGRJQD. (rus.).
- Formation of the concept of systemic competitiveness of construction in the digital economy. *Economics and entrepreneurship*. 2021; 1(126):716-720. DOI: 10.34925/EIP.2021.126.01.138. EDN THRRRX. (rus.).
- Silka D.N. Factors of business activity cycles determining the competitiveness of construction. *Bulletin of the University*. 2013; 7:96-100. (rus.).
- Babenchuk K.A. Managing the competitiveness of construction organizations (using the example of Samara housing construction) : abstract of the dissertation for the degree of Candidate of Economic Sciences. Saint Petersburg, St. Petersburg State Engineer-Economist. un-t., 2007. (rus.).
- Andreev V.A., Baronin S.A., Belyakova V.A. Theory and methodology of business systems competitiveness management / Under the general editorship of S.A. Baronin, L.N. Semerkova. Moscow, Infra-M Publishing House, 2013; 329. EDN WZPWQJ. (rus.).
- Baronin S.A., Korshunov A.S. Problematic aspects of managing the competitiveness of regional leading companies in the primary housing real estate markets. *Proceedings of the Southwestern State University*. 2011; 5-2(38):265a-272. EDN ONULBF. (rus.).
- Batishcheva G.A., Zhuravleva M.I., Lukyanova G.V., Ponomareva S.V. Nonlinear dynamic model of equilibrium in the economic system "Intermediary activity". *Bulletin of the Rostov State University of Economics (RINH)*. 2020; 1(69):144-150. EDN SVOHIW. (rus.).
- Batishcheva G.A., Zhuravleva M.I. A general approach to the analysis of the equilibrium of dynamic systems in the economic sphere. *Informatization in the digital economy*. 2021; 2(1):9-16. DOI: 10.18334/ide.2.1.113380. EDN ZCLHPK. (rus.).
- Melnik M.S. Structural and dynamic equilibrium of socio-economic systems. *Human capital*. 2013; 11(59):45-51. EDN RTPPZX. (rus.).
- Kichigin O.E. Dynamic equilibrium of regional socio-economic systems and corporate structures of the fuel and energy complex. *Journal of Legal and Economic Research*. 2015; 4:94-101. EDN VBCRVR. (rus.).
- Knight F.H. Risk, uncertainty and profit, Translated from English. Moscow, Delo, 2003; 360. (rus.).
- Orlov A.K., Bolgov V.A. Forecast of the cost of basic building materials in conditions of uncertainty: methodology and practice. *Bulletin of MGSU*. 2023; 18(2):293-303. DOI: 10.22227/1997-0935.2023.2.293-303. EDN KODHOT. (rus.).
- Petrova D.A., Trunin P. Assessment of the level of uncertainty of economic policy. *Money and credit*. 2023; 3(82):48-61. EDN RWXGFN. (rus.).
- Obukhov R.V., Kankhva V.S. Formation of methodological tools for assessing the competitive advantages of construction enterprises based on the analysis of factor space. *Economics of construction*. 2024; 5:102-105. EDN OQACSN. (rus.).
- Baronin S.A., Yankov A.G., Bizhanov S.A. Assessing the cost of real estate lifecycle contracts in Russia's present-day economy and the characteristics of the European experience. *Life Science Journal*. 2014; 11(8s):249-253.
- Baronin S.A., Guschina E.S., Romanova A.I. Integrated green construction as a prerequisite for sustainable urban development. *E3S Web of Conferences : XII International Scientific and Practical Forum — "Environmentally sustainable cities and settlements: problems and solutions" (ESCP-2023)*, Moscow, Hanoi, April 20–21, 2023. Vol. 403. Moscow, Hanoi, 2023; 02013. DOI: 10.1051/e3sconf/202340302013. EDN JMXCSX.
- Baronin S., Guschina E., Kulakov K. Features of enhancing environmentally-oriented green construction at the regional level. *E3S Web of Conferences, Voronezh, October 09–13, 2023*. Vol. 458. Voronezh, EDP Sciences, 2023; 04018. DOI: 10.1051/e3sconf/202345804018. EDN BUPUUZ.
- Baronin S., Kulakov K., Uchinina T., Berezneva M. Competitive strategy of sustainable and eco-oriented development of investment-construction company. *E3S Web of Conferences : XII International Scientific and Practical Forum — "Environmentally sustainable cities and settlements: problems and solutions" (ESCP-2023)*, Moscow, Hanoi, April 20–21, 2023. Vol. 403. Moscow, Hanoi, 2023; 02014. DOI: 10.1051/e3sconf/202340302014. EDN PBXJW.
- Styazhkova N., Baronin S., Kulakov K. Current trends in the development of the national land market and issues of ensuring its sustainability and harmonization. *E3S Web of Conferences, Voronezh, October 09–13, 2023*. Vol. 458. Voronezh, EDP Sciences, 2023; 04017. DOI: 10.1051/e3sconf/202345804017. EDN MQETYC.
- Obukhov R.V. Competitiveness of construction enterprises based on the concept of dynamic equilibrium. *Real estate: economics, management*. 2024; 3-Appendix:203-206. (rus.).
- Obukhov R.V. Modelling the competitiveness of construction enterprises based on the concept of dynamic equilibrium. Sustainability of territorial development in the investment and construction sector in a turbulent economy: proceedings of the III National Scientific and Practical Conference with international participation, Penza, November 28–29, 2024. Penza, Penza State University of Architecture and Construction, 2024; 173-178. EDN FNMMKG.

Обеспечение конкурентоспособности предприятий строительной отрасли на основе концепции динамического равновесия

Актуальность исследования. Исследования показывают, что особое место занимает в современной турбулентной экономике проблематика развития теории и практики моделирования конкурентности строительных предприятий с позиций оценки и интегрального управления как его текущей, среднесрочной, так и стратегической конкурентоспособностью через концептуальный механизм динамического равновесия внутренней и внешней среды в условиях неопределенности и риска.

Цель исследования. Обоснование методических подходов по обеспечению процессов оценки и управления конкурентоспособностью строительных предприятий на основе концепции динамического равновесия внутренней и внешней среды в условиях риска и неопределенности через моделирование совокупного конкурентного потенциала по ключевым факторам успеха.

Методы. Использовался комплекс системно взаимосвязанных методических подходов, основанных как на теории конкурентоспособности, так и на концепции динамического равновесия экономических систем. Применялись также методы факторного и трендового анализа, математической статистики, экономико-математического моделирования и прогнозирования, экспертных оценок, теории неопределенности и рисков, сравнения, анализа и синтеза.

Результаты и новизна. В статье продемонстрированы следующие основные научные результаты с элементами научной новизны: уточнение понятийной категории «конкурентоспособность» с определением комплекса системных принципов по моделированию и ситуационной оценке конкурентоспособности с использованием индикативной секторограммы; смоделирована концепция динамического равновесия конкурентоспособности для строительного предприятия по направлениям управления производительностью и стоимостью с разработкой понятийной категории «неопределенность»; выполнена обобщенная классификация и анализ ключевых факторов успеха, определяющих конкурентоспособность на основе структуризации локальных потенциалов инвестиционного, организационно-производственного и финансово-экономического типа; разработан методический подход по определению расчетных индикаторов конкурентоспособности предприятий; установлены основные закономерности изменения ключевых факторов управления конкурентоспособностью на операционном, тактическом и стратегическом уровнях управления на примере конкурентного профиля ООО «Тоннель-2001».

Ключевые слова: совокупная конкурентоспособность, потенциальная конкурентоспособность, внутренняя конкурентоспособность, оценка, управление, строительное предприятие, неопределенность, концепция динамического равновесия, внутренняя среда, внешняя среда, ключевые факторы успеха

СПИСОК ИСТОЧНИКОВ

1. Гумба Х.М., Мамаев М.И. Концептуальные основы формирования устойчивых конкурентных преимуществ // *Известия Иркутской государственной экономической академии*. 2014. № 1. С. 11. EDN RXBVTN.
2. Лукманова И.Г. Проблемы обеспечения качества и конкурентоспособности продукции предприятий стройиндустрии : автореф. дис. ... д-ра эконом. наук. М. : Московский государственный строительный университет, 2001.
3. Лукманова И.Г., Сарченко В.И., Ладыгина Е.Е. Клиентоориентированность предприятия — важнейший резерв повышения

- конкурентоспособности // *Экономика строительства*. 2020. № 3(63). С. 24–32. EDN LMANJR.
4. Лукманова И.Г., Казинец Л.А. Повышение конкурентоспособности строительных организаций в условиях саморегулирования // *Недвижимость: экономика, управление*. 2010. № 1–2. С. 24–27. EDN MQPNJT.
5. Яськова Н.Ю., Лукманова И.Г. От конкурентоспособности к стратегическому преимуществу предприятия // *Известия высших учебных заведений. Технология текстильной промышленности*. 2018. № 2 (374). С. 44–49. EDN LXXTKX.
6. Яськова Н.Ю., Лукманова И.Г. Новые горизонты конкурентоспособности национальной экономики // *Известия высших учебных заведений. Технология текстильной промышленности*. 2019. № 2 (380). С. 23–28. EDN YTNINT.
7. Яськова Н.Ю., Сарченко В.И., Хиревич С.А. Комплексный подход к формированию качественной, конкурентоспособной городской среды. М. : Издательско-торговая корпорация «Дашков и К», 2023. 356 с. DOI: 10.29030/978-5-394-05353-5-2023. EDN WMBVUE.
8. Бороздина С.М. Управленческий механизм обеспечения конкурентоспособности девелоперской компании на рынке жилищной недвижимости : автореф. дис. ... канд. эконом. наук. М., 2017. 24 с.
9. Грабовый П.Г., Луняков М.А. Управление результативностью в инвестиционно-строительном комплексе: планирование, мониторинг и повышение уровня // *Недвижимость: экономика, управление*. 2015. № 2. С. 11–13. EDN UIUUNP.
10. Грабовый П.Г., Королев Н.И. Методы повышения надежности генподрядных систем управления проектами жилых комплексов в условиях рисков и неопределенностей // *Недвижимость: экономика, управление*. 2024. № S3. С. 91–94.
11. Ларионов А.Н., Прыгунов П.И., Коцеев В.А. Методы улучшения конкурентоспособности организации // *Вестник гражданского инженера*. 2016. № 6 (59). С. 339–341. EDN XGRJQD.
12. Гумба Х.М., Уварова С.С., Беляева С.В., Белянцева О.М. Формирование концепции системной конкурентоспособности строительства в цифровой экономике // *Экономика и предпринимательство*. 2021. № 1 (126). С. 716–720. DOI: 10.34925/EIP.2021.126.01.138. EDN THRRRX.
13. Силка Д.Н. Факторы циклов деловой активности, определяющие конкурентоспособность строительства // *Вестник университета*. 2013. № 7. С. 96–100.
14. Бабенчук К.А. Управление конкурентоспособностью строительных организаций (на примере жилищного строительства Самары) : автореф. дис. ... канд. эконом. наук. СПб. : СПб. гос. инженер.-эконом. ун-т., 2007.
15. Андреев В.А., Баронин С.А., Белякова В.А. и др. Теория и методология управления конкурентоспособностью бизнес-систем / под общ. ред. С.А. Барониной, Л.Н. Седерковой. М. : Издательский Дом «Инфра-М», 2013. 329 с. EDN WZPWQJ.
16. Баронин С.А., Коршунов А.С. Проблемные аспекты управления конкурентоспособностью региональных компаний-лидеров на первичных рынках жилищной недвижимости // *Известия Юго-Западного государственного университета*. 2011. № 5–2 (38). С. 265а–272. EDN ONULBF.
17. Батищева Г.А., Журавлева М.И., Лукьянова Г.В., Пономарева С.В. Нелинейная динамическая модель равновесия в экономической системе «Посредническая деятельность» // *Вестник Ростовского государственного экономического университета (РИНХ)*. 2020. № 1 (69). С. 144–150. EDN SVONIW.
18. Батищева Г.А., Журавлева М.И. Общий подход к анализу равновесия динамических систем в экономической сфере // *Информатизация в цифровой экономике*. 2021. Т. 2. № 1. С. 9–16. DOI: 10.18334/ide.2.1.113380. EDN ZCLHPK.
19. Мельник М.С. Структурно-динамическое равновесие социально-экономических систем // *Человеческий капитал*. 2013. № 11 (59). С. 45–51. EDN RTPPZX.
20. Кичигин О.Э. Динамическое равновесие региональных социально-экономических систем и корпоративные структуры топливно-энергетического комплекса // *Журнал правовых и экономических исследований*. 2015. № 4. С. 94–101. EDN VBCRVR.
21. Найт Ф.Х. Риск, неопределенность и прибыль / пер. с англ. М. : Дело, 2003. 360 с.

22. Орлов А.К., Болгов В.А. Прогноз стоимости основных строительных материалов в условиях неопределенности: методика и практика // Вестник МГСУ. 2023. Т. 18. № 2. С. 293–303. DOI: 10.22227/1997-0935.2023.2.293-303. EDN KODHOT.

23. Петрова Д.А., Трунин П. Оценка уровня неопределенности экономической политики // Деньги и кредит. 2023. № 3. Т. 82. С. 48–61. EDN RWXGFN.

24. Обухов Р.В., Канхва В.С. Формирование методического инструментария оценки конкурентных преимуществ строительных предприятий на основе анализа факторного пространства // Экономика строительства. 2024. № 5. С. 102–105. EDN OQACSN.

25. Baronin S.A., Yankov A.G., Bizhanov S.A. Assessing the cost of real estate lifecycle contracts in Russia's present-day economy and the characteristics of the European experience // Life Science Journal. 2014. № 11 (8s). Pp. 249–253.

26. Baronin S.A., Guschina E.S., Romanova A.I. Integrated green construction as a prerequisite for sustainable urban development // E3S Web of Conferences : XII International Scientific and Practical Forum — “Environmentally sustainable cities and settlements: problems and solutions” (ESCP-2023), Moscow, Hanoi, 20–21 апреля 2023 года. Vol. 403. Moscow, Hanoi, 2023. P. 02013. DOI: 10.1051/e3sconf/202340302013. EDN JMXCSX.

27. Baronin S., Guschina E., Kulakov K. Features of enhancing environmentally-oriented green construction at the regional level // E3S Web of Conferences, Voronezh, 09–13 октября 2023 года. Vol. 458. Voronezh : EDP Sciences, 2023. P. 04018. DOI: 10.1051/e3sconf/202345804018. EDN BUPUUZ.

28. Baronin S., Kulakov K., Uchinina T., Berezneva M. Competitive strategy of sustainable and eco-oriented development of investment-construction company // E3S Web of Conferences : XII International Scientific and Practical Forum — “Environmentally sustainable cities and settlements: problems and solutions” (ESCP-2023), Moscow, Hanoi, 20–21 апреля 2023 года. Vol. 403. Moscow, Hanoi, 2023. P. 02014. DOI: 10.1051/e3sconf/202340302014. EDN PBXJW.

29. Styazhkova N., Baronin S., Kulakov K. Current trends in the development of the national land market and issues of ensuring its sustainability and harmonization // E3S Web of Conferences, Voronezh, 09–13 октября 2023 года. Vol. 458. Voronezh : EDP Sciences, 2023. P. 04017. DOI: 10.1051/e3sconf/202345804017. EDN MQETYS.

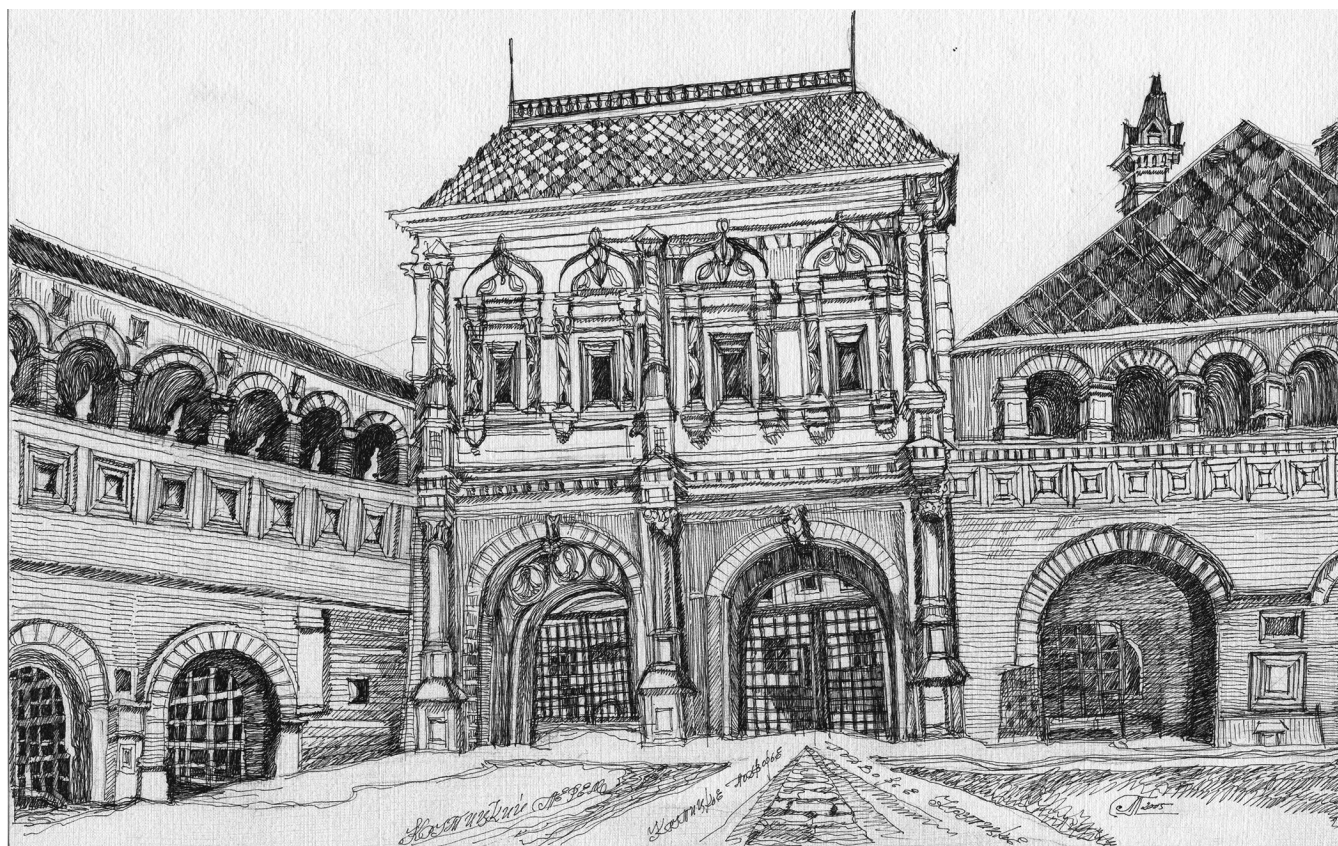
30. Обухов Р.В. Конкурентоспособность строительных предприятий на основе концепции динамического равновесия // Недвижимость: экономика, управление. 2024. Приложение № 3. С. 203–206.

31. Обухов Р.В. Моделирование конкурентоспособности строительных предприятий на основе концепции динамического равновесия // Устойчивость развития территорий в инвестиционно-строительной сфере в условиях турбулентной экономики : мат. III Нац. науч.-практ. конф. с междунар. участием, Пенза, 28–29 ноября 2024 года. Пенза : Пензенский государственный университет архитектуры и строительства, 2024. С. 173–178. EDN FNMMKG.

Об авторе: **Обухов Роман Владимирович** — аспирант, кафедра «Экономики и управления в строительстве»; **Национальный исследовательский Московский государственный строительный университет (НИУ МГСУ)**; 129337, г. Москва, Ярославское шоссе, д. 26; AuthorID: 865288, SPIN-код: 7149-0013; romanob@yandex.ru.

For citation: Obukhov R.V. Ensuring competitiveness of enterprises in the construction industry on the basis of dynamic equilibrium concept. *Real Estate: Economics, Management*. 2025; 2:19-27.

Для цитирования: Обухов Р.В. Ensuring competitiveness of enterprises in the construction industry on the basis of dynamic equilibrium concept // Недвижимость: экономика, управление. 2025. № 2. С. 19–27.



Москва. Крутицкий терем. Рисунок, тушь, перо