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FINANCIAL AND ECONOMIC PREREQUISITES FOR STRUCTURING THE CONSTRUCTION BUSINESS ECOSYSTEM

ABSTRACT

The article is devoted to the verification of hypotheses about the consistency of the ecosystem approach to strategic business development with the tasks of bringing sectoral business models closer to the principles of sustainable development and increasing the adaptability of enterprises included in the ecosystem to changes in technological, macroeconomic, and institutional conditions of functioning. The analytical grouping and correlation-regression analysis were conducted to substantiate those functions performed by branches involved in the business ecosystem, with the core in construction, that have significant differences compared with those theoretically justified in scientific literature. The significant difference between the actual driving forces and trends of ecosystem formation in the Ukrainian economy and theoretical ideas about the patterns of distribution of roles, benefits, and costs in the process of formation and development of the business ecosystem. In particular, the theoretical theses that the development of the business ecosystem provides additional benefits to those enterprises and industries that take on a greater burden of financing innovations have not received empirical confirmation. It was found that the best conditions for reproducing resource potential were received by industries involved in trade intermediation, and the key industries for innovation (activities in the field of architecture and engineering) were under significant pressure due to the lag in the pace of growth of prices for their own services compared to the prices of other participants in the business ecosystem.

Keywords: business ecosystem, construction, added value, reproduction of resource potential, industry structure

JEL Classification: L74, L26, O32

INTRODUCTION

The performance of the construction industry has traditionally been considered a critically important indicator of the state of the national economy, in particular, the European Construction Sector Observatory (2021) emphasizes not only the significant contribution of construction itself to increasing growth rates, but also its significant impact on the indicators of other industries, and the fundamental guide to the empirical study of cyclical fluctuations, prepared by Eurostat & Conference Board (2017) classifies the dynamics of value added, hours worked, and employment in this industry as "Leading indicators that outpace cyclical disturbances." However, in today's Ukraine, the development of the construction industry is of particular importance not only as an indicator of the national economy's recovery and a process that accompanies the growth of the scale of value added generated in it. Given the enormous destruction caused by Russia's invasion, the presence of more than four and a half million IDPs by Ministry of Social Policy of Ukraine data (2025), the critical need to restore and develop our own industrial base, including the military-industrial complex, the state of resource provision for the construction industry, the ability of existing business and government institutions to ensure its effective and appropriate use for public tasks, is becoming a critical condition for Ukraine's survival in wartime, preventing a social catastrophe – at the current stage and a decisive driving force for economic recovery and development – in the future. Accordingly, the subject matter of our study (the applicability of the ecosystem approach as a basis for scientific support of the construction industry development policy) is of

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particular relevance in terms of the tasks of formation and realization of the potential of the post-war recovery of the Ukrainian economy.

LITERATURE REVIEW

Based on the above, the focus of our article is not on the development of the construction industry as such, but on the impact of this development as a lever for spreading growth to other types of economic activity, i.e., the connection between the model of construction business development and benefits and costs (lost opportunities) that such development generates for the economy and society as a whole.

According to Kolot and Gerasimenko (2021;2024), the most adequate theoretical framework for this task is provided by the theory of ecosystem development, which combines the concept of strategic business organization, as presented by Iansiti & Levien (2004); a vision of approaches to coordinating the development priorities of various industries, for example as Jacobides, Cennamo & Gawer (2015); and a certain ideology of cost and benefit distribution in the process of economic application of scientific and technological progress, as may be seen in Adner, R., & Kapoor, R. (2010), which is consistent with the principles of sustainable development and inclusive growth, as emphasized by Iansiti & Levien (2004).

After all, the theoretical basis of our study goes beyond purely cost-based, structural analysis, the tools of which are developed within the framework of basic macroeconomic models of inter-sectoral interaction, as, for example, Cella, G., Fundamental work (1984).

In particular, the Gosch (1958) multiplier characterizes "forward linkages", i.e., the scale of value-added growth in industries that consume the products of the industry, whose impact on national economic growth (contribution to value-added generation – both direct and indirect through the impact on the operating conditions of other industries) is being studied.

And the Leontief multiplier measures "backward linkages", i.e., the scale of value-added growth in industries that supply raw materials, semi-finished products, and inputs to the industry whose growth impact on national production is measured, as was used by Cai, Leung, Mak (2016).

However, in the context of our study, such tools are insufficient, because it is not about fixing certain functional relationships that develop between the growth of value added and intermediate consumption of different industries and sectors in the course of economic functioning, but about a conscious choice of the strategy of "co-evolution of industries", as formulated by Jacobides (2005) and coordination of the parameters of participation of different industries in the processes of innovative development.

Accordingly, the ecosystem approach to strategizing the development of industries makes it possible to plan the pace of growth of value-added generation and expansion of the resource potential of industries that become elements of the ecosystem and share the values and principles laid down in the process of forming the "core" of the ecosystem, or, in the expression of Gulati R., Puranam P., Tushman M. (2012) "determining its architecture." This means that the methodology of ecosystem analysis involves the study of the interaction of enterprises belonging to different industries as a process of coordination of development policies, coordinated formation of an environment, the principles of interaction in which increase the chances of spreading the most productive and valuable solutions, business practices, organizational structures, and forms of cooperation, as shown by Williamson, De Meyer (2012).

Therefore, for our study, the strength of the tendency to manifest the coherence, interdependence of the dynamics of value added, to transform the relations of competition – and to replace them with the relations of complementarity of increasing the volume of value added, which is highlighted as a crucial sign of the viability of the ecosystem in articles of Jacobides., Cennamo & Gawer (2018).

AIMS AND OBJECTIVES

Thus, the contribution of our article to the development of the ecosystem approach is, first, to expand the empirical database that can be used by researchers to clarify the forms of manifestation of general trends and patterns of formation of business ecosystems in countries with weak institutional structures and relatively low business innovation activity. And, secondly, in testing methods of empirical testing of hypotheses about the composition and stages of development of business ecosystems, which can be used, in particular, for analytical support of the development of sectoral regulatory policy and substantiation of forecasts of the potential for post-war recovery and restructuring of the Ukrainian economy, and identification of factors for its fuller use.

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Thus, the aim of this article is to assess the favorability of Ukraine's socio-economic conditions in the pre-war period and in the first years of the war for the formation of business ecosystems and to test methodological approaches to quantify the strength of the trend toward complementary income growth of ecosystem participants.

METHODS

This study tests tools designed for research at the level of industries and types of economic activity, rather than for individual cases (companies, individual transactions, or policies at the level of business entities). This will help to meet the needs for analytical support for the development and implementation of public policy, in particular, sectoral regulation, which focuses on the consequences for society as a whole and monitors trend at the level of industries and types of economic activity, rather than individual enterprises.

The focus of our study is on the signs of ecosystem formation, the core of which is formed by the construction industry, and the functions of ecosystem formation itself (functions of its architect in expression of Gulati R., Puranam P., Tushman M. (2012)) and ensuring the extraction of benefits for stakeholders in the process of such formation – development activities, which according to the current Economic Activities Classification does not have a specific code and is most commonly classified as "Organization of construction of buildings", code 41.10.

To determine the composition of the business ecosystem formed around construction activities, we used a combination of two methods: functional and linguistic analysis. The first, informal, assumed that the ecosystem includes economic activities (EAs) for which the following conditions are met: a) a significant share of their output is included in intermediate consumption of construction (e.g., "activities in the fields of architecture and engineering; technical testing and research" (code 71), "production of ceramic tiles and slabs" (code 23.31), "production of cement, lime and gypsum mixtures" (code 23.5), etc.) b) the products of these EAs are considered as a complementary product to the products of the construction industry (e.g., "production of panel parquet" (code 16.22); "production of wallpaper" (code 17.24), etc.).

The second method is formal and linguistic. We selected from the set of EAs those whose names contain the words "construction" in any case (e.g., "manufacture of concrete products for construction", "production of dry building mixtures", "wholesale trade in wood, building materials and sanitary equipment", etc.).

As a result, 84 types of economic activity were selected, which, according to the above criteria, are classified as part of the business ecosystem with a core in the construction industry.

The defined composition of the ecosystem with the core in the construction industry is debatable and will be the subject of further research. For example, the authors are still open to the question of the expediency of including in the ecosystem some industries of group E "Water supply; sewerage, waste management" and group D "Supply of electricity, gas, steam and air conditioning", whose services can be interpreted as complementary goods in relation to the construction industry. Similarly, certain EAs of Group L "Real estate operations" have the characteristics of complementary goods in relation to construction products. In our opinion, it is also critically important to study the role of financial institutions in shaping the business ecosystem, the impact of their policies on the distribution of costs and benefits of the construction industry and the business ecosystem around it, in particular on the pace of capacity expansion of construction companies and the construction materials industry, which are the determining factors in increasing the availability of housing for the population and ensuring the rapid expansion of non-residential real estate for the growth of national production.

In this article, EAs belonging to groups "E" and "D" are not included in the ecosystem because the overwhelming share of their output is related to the operation of housing and non-residential (industrial) premises, and the entire stock, not just the newly built housing, during the accounting period. Accordingly, the inclusion of indicators of the respective EAs would cause a significant distortion and would require separating the share of the value added of these EAs that is related to the housing and non-residential stock newly built during the accounting period. As long as such a separation is not possible with the information base available to the authors, we have refrained from including these EA in the ecosystem that is being formed around the construction industry, but in the future, as more accurate data are obtained, adjusting the composition of the ecosystem seems to be a promising area of research.

At the next stage, calculations were made to aggregate the indicators for individual EAs into groups by industry. As a result, generalized indicators for the groups were obtained: "Enterprises related to the construction industry and belonging to the extractive industry", "Enterprises related to the construction industry and belonging to the processing industry", "Enterprises related to the construction industry and belonging to the wholesale and retail trade", "Enterprises related to the construction industry and belonging to the activities in the field of architecture and engineering." Of course, all EAs belonging to the EA "F" "Construction" group were also included in the business ecosystem and were studied as a single

group. Accordingly, all calculations summarize heterogeneous trends for individual enterprises (among which there are naturally those that benefit from the implemented ecosystem formation scenario and those that face problems and deterioration of target indicators) and thus identify the leading, dominant, "final" trend for the retrospective period within the studied industry (sector) of the economy.

To ensure the comparability of indicators for different years, all value-added indicators are adjusted to constant prices of the base year (2012). For the construction indicators, price indices in construction were used (State Statistic Service of Ukraine), and for the types of economic activity related to mining and manufacturing, electricity, gas, and steam supply, price indices of the respective group of industrial producers.

The aggregate price index for the entire ecosystem (*API*) is calculated using the weighted average formula:

$$\text{API}, = \sum_1^5 IP_i \times SH_i \quad (1)$$

where: IP_i *– is the price index for the first (one of five) group of enterprises participating in the business ecosystem with a core in the construction industry in Ukraine;* SH_i *– is the share of the i-th group of enterprises in the total value added generated by the entire business ecosystem.*

Correlation coefficient matrices (traditional Pearson's linear correlation coefficients) were used to assess the relatedness of the dynamics of value added generated within the studied ecosystem.

RESULTS

The initial hypothesis underlying this study is that the formation of a business ecosystem is reflected in the change in the nature of the relationship between the income generated by enterprises within such a system. If the relations between enterprises (within an industry or belonging to different industries) are dominated by competition and mutual displacement, then a negative correlation will be observed with respect to the income generated by such enterprises. Of course, it is not correct to reduce the reasons for this relationship to competition between the products of enterprises only – the crowding-out effect can arise due to competition for resources, due to changes in the "Leontief coefficients" between industries, which express the volume of products of one industry that are consumed by another to ensure the production process, or even indirectly through the impact on third industries that are not even included in the ecosystem. The main thing is that such a negative correlation directly contradicts the thesis of the ecosystem nature of the interaction of enterprises from the industries under study.

Accordingly, in terms of time series, if the growth of revenues of one group of enterprises is accompanied by a decrease in revenues of others and vice versa, it is a reliable sign that allows us to refute the hypothesis that ecosystemic links between enterprises in the studied industries prevail. Of course, certain exceptions to this trend may be due to other factors, as the actual data do not meet the "ceteris paribus" conditions. In particular, the decline in consumer income may be the dominant factor that causes a simultaneous reduction in revenues (and value added) of enterprises in both competing industries, or growth may cause their simultaneous increase, but if we eliminate the influence of distorting factors, we will clearly observe an inverse relationship between the amount of value added generated in one industry and the amount of such value generated in another.

The aggregated results of the author's calculations (for the five groups of enterprises included in the business ecosystem under study) are presented in Table 1.

The results of the calculations show that the real (expressed in prices of the base year, 2012) volumes of value added generated both within the entire construction ecosystem and within almost all of its components have undergone a significant decline. Thus, the total amount of value added generated by all industries included in the construction ecosystem, having undergone a significant decline in the period 2012-2019, approached almost the level of the base year in the last year before the start of the full-scale invasion, and in 2023 the amount of value added generated in the construction ecosystem was equal to only 47.16% of the level of the base year 2012.

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Table 1. Gross value added generated in the main groups of enterprises belonging to the business ecosystem with a core in the construction industry in Ukraine. *(Source: calculated by the author based on the State Statistic Service of Ukraine. Official site database)*

Years	Total, in the business ecosystem that is being formed around the construction industry		Enterprises directly related to construction and belonging to the extractive industry		Enterprises directly related to construction and belonging to the processing industry	
	Nominal (in actual prices, UAH thousand)	Real (in fixed prices of the base year, UAH thousand)	Nominal (in actual prices, UAH thousand)	Real (in fixed prices of the base year, UAH thousand)	Nominal (in actual prices, UAH thousand)	Real (in fixed prices of the base year, UAH thousand)
2012	58292740.7	58292740.7	2200784.0	2200784	17267091.6	17267091.6
2013	79720295.1	76952212.8	1950765.4	2004897.64	17712065.9	17854905.1
2014	93720883.2	80111763.4	1958796.0	1770581.42	19637842.7	16748064.7
2015	76126579.8	49224287.6	1050723.3	704571.652	23369855.7	14580028.3
2016	103727889.7	59393962	1567476.7	780895.35	31096047.5	16943457.6
2017	122724527.1	59775449.3	1722894.1	569556.843	33751466.1	15086405.9
2018	146020258.8	60028524.8	1845094.2	516035.474	39375495.6	15575454.7
2019	214484844.5	84979796.4	2433802.3	656398.462	48887023.9	19337855.1
2020	230919529.4	86826104.4	2248439.7	715945.712	50580854.0	19692785.5
2021	281910179.9	88576021.3	3393008.9	577444.247	58975778.7	17676062.4
2022	191139324.1	44918610	1259075.7	148597.547	38889822.5	9287612.27
2023	263106137.9	52244180.7	1800272.4	159752.029	61459523.0	12741038.3

Years	Construction		Enterprises directly related to construction and belonging to the "wholesale and retail trade"		Activities in the field of architecture and engineering	
	Nominal (in actual prices, UAH thousand)	Real (in fixed prices of the base year, UAH thousand)	Nominal (in actual prices, UAH thousand)	Nominal (in actual prices, UAH thousand)	Real (in fixed prices of the base year, UAH thousand)	Nominal (in actual prices, UAH thousand)
2012	24070685.4	24070685.4	6196693.1	6196693.1	8557486.6	8557486.6
2013	41434204.4	39236936	6826530.9	6545091.95	11796728.5	11310382.1
2014	51341485.9	44400759.2	9239135.9	7642995.62	11543622.7	9549362.49
2015	37068229.7	25221926.6	7612534.4	4533767.85	7025236.7	4183993.21
2016	48267551.9	30075236.1	10559633.9	5370589.72	12237179.7	6223783.15
2017	58500891.0	32144242.8	12927059.6	5384646.56	15822216.3	6590597.18
2018	71230621.3	31820158.6	16579355.2	5984381.59	16989692.5	6132494.4
2019	120159177.5	50639182.9	22302922.6	7440226.53	20701918.2	6906133.5
2020	120774183.7	49082321.6	39630395.3	11986082.8	17685656.7	5348968.73
2021	165348656.3	57189169.5	32756300.5	7938329.66	21436435.5	5195015.59
2022	91002489.5	24705688.7	44439832.3	7983526.02	15548104.1	2793185.47
2023	109202462.1	25601626.8	70410692.4	10674378.5	20233188.0	3067385.08

Only two groups of enterprises in the construction ecosystem show positive dynamics of value added as of 2023: construction itself (although the structure of this complex of economic activities shows different trends in the scale of real value added) and those groups of enterprises directly related to construction and belonging to wholesale and retail trade. At the same time, construction is the only industry among all ecosystem participants whose graph is above the 100% mark throughout the entire retrospective period, i.e., the real value added generated by this group of enterprises has never fallen below the level of the base year (2012) (Figure 1). At the same time, there were years of very significant growth, so in 2014 the volume of value added generated in construction was equal to 184.5% of the 2012 level, in 2019 – 210.4%, in 2021 – 237.6% of the 2012 level.

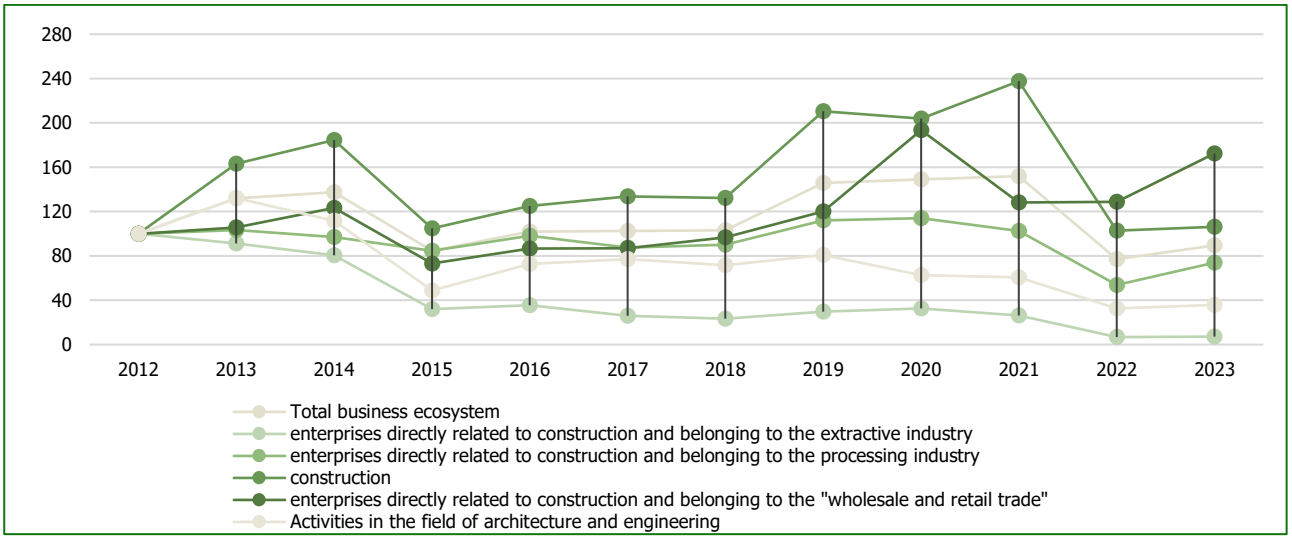

Figure 1. Dynamics of real (constant prices) volumes of value added generated by the construction ecosystem.

Enterprises of industries directly related to construction and belonging to the wholesale and retail trade are the second and last in the construction ecosystem, a group of enterprises that demonstrated higher volumes of added value generated in 2023 than in the base year 2012.

The graphs of the real dynamics of all other groups of enterprises participating in the construction-related business ecosystem are mostly below the 100% line, i.e., they do not reach the level of the base year of 2012 throughout the retrospective period. And some demonstrate catastrophic dynamics of real value added: in particular, the scale of revenues generated by enterprises directly related to construction and belonging to the mining industry decreased by more than 10 times; by enterprises directly related to construction and belonging to utilities – by almost five times; by enterprises directly related to construction and belonging to architecture and engineering - by almost two-thirds.

Therefore, it is difficult to consider the retrospective period as a stage of development of the business ecosystem, but rather as a more or less successful adaptation of its participants to the challenges and socio-political shocks faced by society as a whole and the economy. Accordingly, the trends of sharing and reproduction of the development resource base, sharing and efforts to expand demand are combined with contradictory trends, which will be clarified and analyzed in the discussion section.

DISCUSSION

As a result of significant and multidirectional changes in the real scale of value-added generation in the components of the ecosystem, structural shifts in the business ecosystem, with the construction industry as its core, have been observed over the retrospective period. The nature of these changes can be used to assess the stages of development of the studied ecosystem, the main trends in the distribution of costs and benefits from integration into it, and the extent to which the potential it provides to its participants is used, as shown by Jacobides, Knudsen & Augier (2006). Table 2 summarizes the structure of the value added generated in the ecosystem around the construction business by the six main components of this ecosystem.

An important feature of the structural changes in the ecosystem is the increasing importance of only two groups of enterprises – the construction industry, which is actually part of all EAs, and the wholesale and retail trade enterprises related to construction. Such a composition of EAs that managed to ensure positive dynamics during the retrospective period (only the industry that is the "core of the business ecosystem" and the industry that ensures the movement of products within and outside the ecosystem) and expand their share in the total value added generated within the ecosystem, indicates that the actual characteristics of the distribution of benefits, generated by the business ecosystem do not contribute to the growth of innovative activity of its participants and the improvement of socio-economic efficiency, in particular, the growth of housing affordability. Such a feature confirms results of our previous research (Omelchuk, 2025) and contradicts the philosophy of the business ecosystem as a guarantee of the sustainability of its development, as states Iansiti & Levien (2004) and the use of ecosystems as a lever for optimizing the role of industries and types of economic activity in solving social development problems as formulated by Lopuschnyak, Chala, Poplavska (2021).

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In our opinion, the significant differences observed between the trends in the structure measured in nominal and real terms (expressed in constant prices of the base year) are important. For example, while the share of ecosystem participants belonging to the extractive industry decreased from 3.8% to 0.7% in nominal terms, it fell to 0.3% in real terms, i.e., to more than half the share.

In terms of nominal value added, the construction industry kept its share almost unchanged, while in terms of real value added, it increased from 41.3% to 49%, or by almost 8 percentage points, which is the second largest increase in importance among all the selected groups of enterprises participating in the business ecosystem with a core in the construction industry.

Table 2. Shares of the main groups of participants in the added value generated in the business ecosystem, with a core in the construction sector. *(Source: calculated by the author based on the State Statistic Service of Ukraine. Official site database)*

Years	The whole business ecosystem together	Enterprises directly related to construction and belonging to the extractive industry		Enterprises directly related to construction and belonging to the processing industry		Construction		Enterprises directly related to construction and belonging to the "wholesale and retail trade"		Activities in the field of architecture and engineering	
		In nominal terms	By real indicators	In nominal terms	By real indicators	In nominal terms	By real indicators	In nominal terms	By real indicators	In nominal terms	By real indicators
2012	100	3.8	3.8	29.6	29.6	41.3	41.3	10.6	10.6	14.7	14.7
2013	100	2.4	2.6	22.2	23.2	52.0	51.0	8.6	8.5	14.8	14.7
2014	100	2.1	2.2	21.0	20.9	54.8	55.4	9.9	9.5	12.3	11.9
2015	100	1.4	1.4	30.7	29.6	48.7	51.2	10.0	9.2	9.2	8.5
2016	100	1.5	1.3	30.0	28.5	46.5	50.6	10.2	9.0	11.8	10.5
2017	100	1.4	1.0	27.5	25.2	47.7	53.8	10.5	9.0	12.9	11.0
2018	100	1.3	0.9	27.0	25.9	48.8	53.0	11.4	10.0	11.6	10.2
2019	100	1.1	0.8	22.8	22.8	56.0	59.6	10.4	8.8	9.7	8.1
2020	100	1.0	0.8	21.9	22.7	52.3	56.5	17.2	13.8	7.7	6.2
2021	100	1.2	0.7	20.9	20.0	58.7	64.6	11.6	9.0	7.6	5.9
2022	100	0.7	0.3	20.3	20.7	47.6	55.0	23.2	17.8	8.1	6.2
2023	100	0.7	0.3	23.4	24.4	41.5	49.0	26.8	20.4	7.7	5.9

Similarly, for the groups of enterprises whose share in the total value added of the ecosystem decreased during the retrospective period, there are significant differences between the estimates based on nominal and real indicators (Table 2).

The differences between the characteristics of the structure, assessed by nominal and real indicators, that we have identified indicate the critical importance of determining the conditions for the development and simple reproduction of the resource potential of each group of enterprises included in the ecosystem, its ability to transfer the inflationary burden to consumers of its products by raising prices for its own products. This importance of the macroeconomic and institutional conditions for the functioning of the business ecosystem, common to all participants, reduces the importance of the factor of innovation activity of the ecosystem leader, which is considered by Iansiti & Levien (2004) as the main factor for the formation of unity (common trends in increasing added value) of the business ecosystem, the involvement of all its participants in the realization of the economic potential of new technological solutions. After all, such a change in the driving forces behind the formation of ecosystem unity fundamentally changes the ideology and consequences of its functioning, turning it from a lever for harmonizing inter-sectoral relations into a mechanism for pushing innovation activity to the periphery of the ecosystem. Thus, our research has revealed pronounced dysfunctions of the ecosystem with a core in the Ukrainian construction industry, compared to the traditional vision of the business ecosystem's role, proposed by Adner (2016), Davis (2016), and Kolot et al. (2023).

Businesses that are able to raise their prices faster than the prices of the inputs they use in their operations are in a much better position than those that have to accept that their prices are lagging behind the growth rate of input prices. The weight of the proportions of inflationary pressure distribution among business ecosystem participants is an extremely unfavorable condition for the formation of truly organic ties between them. It reinforces the tendency of interaction based

on the principle of "zero-sum game", when the benefits of some are generated through the additional costs of others, which fundamentally contradicts the concept of a business ecosystem: joint investment in the development of the resource base, which reduces the burden on each individual participant and increases the efficiency of investments in non-specific assets; limiting own profitability in order to expand the customer base and develop demand, which allows generating a more even distribution of benefits, expanding the circle of business beneficiaries.

Another confirmation of the importance of the ability to transfer inflationary pressure to consumers by raising their own prices is provided by the calculation of the correlation matrix between the income (value added) generated by different groups of enterprises in the ecosystem formed around the construction industry (Tables 3 and 4).

Table 3. Matrix of correlation coefficients between the dynamics of value added generated by different groups of enterprises participating in the business ecosystem with a core in the construction (nominal indicators). *(Source: calculated by the author based on the State Statistic Service of Ukraine. Official site database)*

	The whole business ecosystem together	Enterprises directly related to construction and belonging to the extractive industry	Enterprises directly related to construction and belonging to the processing industry	Construction	Enterprises directly related to construction and belonging to the "wholesale and retail trade"	Activities in the field of architecture and engineering
The whole business ecosystem together	1.000	0.517	0.973	0.967	0.836	0.918
Enterprises directly related to construction and belonging to the extractive industry	0.517	1.000	0.447	0.650	0.106	0.568
Enterprises directly related to construction and belonging to the processing industry	0.973	0.447	1.000	0.917	0.821	0.915
Construction	0.967	0.650	0.917	1.000	0.681	0.901
Enterprises directly related to construction and belonging to the "wholesale and retail trade"	0.836	0.106	0.821	0.681	1.000	0.681
Activities in the field of architecture and engineering	0.918	0.568	0.915	0.901	0.681	1.000

The matrix of correlation coefficients calculated on the basis of nominal value added by groups of enterprises participating in the business ecosystem gives the impression of high affinity of income dynamics (Table 3). There is no negative correlation coefficient, i.e., no group of enterprises is characterized by an increase in value added against the background of a decline in its volumes in others, and, conversely, by a decrease, during periods of growth in the volume of value added generated by other groups of enterprises of the ecosystem participants.

However, the coefficients calculated using nominal indicators reflect the commonality of the macroeconomic conditions in which all the selected groups of enterprises operate, rather than the true complementarity of the size of the value added generated by them. More correct results are obtained by correlation coefficients based on real (adjusted to base year prices) value-added indicators (Table 4).

The results of the calculations presented in Table 4 indicate that the dynamics of value added generated by different groups of enterprises participating in the business ecosystem formed around construction are less related than those in Table 3.

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Table 4. Matrix of correlation coefficients between the dynamics of value added generated by different groups of enterprises participating in the business ecosystem with a core in the construction (real indicators). *(Source: calculated by the author based on the State Statistic Service of Ukraine. Official site database)*

	The whole business ecosystem together	Enterprises directly related to construction and belonging to the extractive industry	Enterprises directly related to construction and belonging to the processing industry	Construction	Enterprises directly related to construction and belonging to the "wholesale and retail trade"	Activities in the field of architecture and engineering
The whole business ecosystem together	1.000	0.276	0.820	0.962	0.364	0.465
Enterprises directly related to construction and belonging to the extractive industry	0.276	1.000	0.470	0.050	-0.250	0.885
Enterprises directly related to construction and belonging to the processing industry	0.820	0.470	1.000	0.688	0.073	0.594
Construction	0.962	0.050	0.688	1.000	0.364	0.265
Enterprises directly related to construction and belonging to the "wholesale and retail trade"	0.364	-0.250	0.073	0.364	1.000	-0.293
Activities in the field of architecture and engineering	0.465	0.885	0.594	0.265	-0.293	1.000

In particular, there are a number of negative values of correlation coefficients, which indicate the dominance of the trend of multidirectional dynamics in such groups of enterprises. In addition, there is a growing number of groups of enterprises in the business ecosystem that have relatively low average (arithmetic mean of correlation coefficients with all other groups) correlation indicators (Table 5). While according to nominal indicators, only one group of enterprises (extractive industry) has an average correlation coefficient at the level of weak connection (0.45) and one at the level of medium strength (wholesale and retail trade, 0.65), according to real indicators enterprises directly related to construction and belonging to the "Wholesale and retail trade" in general have a negative average value of correlation coefficients, enterprises of the "Activities in the field of architecture and engineering" group are characterized by a weak relationship (average of correlation coefficients 0.50); construction itself correlates with the income of enterprises of other groups on average only at the level of a weak connection (0.38); enterprises directly related to construction and belonging to the processing industry have an average correlation coefficient of 0.57 (a connection of weak medium strength). Accordingly, the overall average value of the correlation coefficients in the matrix decreases significantly: from 0.74 (high density of connection) when using nominal indicators to 0.42 (weak connection) when using real value-added indicators.

Table 5. Indicators of the relatedness of the dynamics of value added generated in groups of enterprises participating in the business ecosystem with a core in the construction industry.

	The average of the corresponding rows from the correlation coefficient matrix (nominal values)	**Average of the corresponding row from the matrix of correlation coefficients (real indicators)**
The whole business ecosystem together	0.84	0.63
Enterprises directly related to construction and belonging to the extractive industry	0.44	0.45
Enterprises directly related to construction and belonging to the processing industry	0.82	0.57
Enterprises directly related to construction and belonging to the sic "supply of electricity, gas, steam and conditioned air" and "water supply, sewerage, waste management"	0.80	0.50
Construction	0.83	0.38
Enterprises directly related to construction and belonging to the "wholesale and retail trade"	0.65	-0.11
Activities in the field of architecture and engineering	0.80	0.50
Total average over the matrix of correlation coefficients	0.74	0.42

Thus, the analysis shows that there was no really tight positive relationship between the dynamics of economic activity volumes and the scale of resource support for production by groups of enterprises participating in the business ecosystem formed around the construction industry in 2012 – 2023. This means that the development of production of some groups of enterprises does not have a noticeable positive impact on the development of resource potential and profitability of other groups. Accordingly, the feature central to taking advantage of the ecosystem approach to business organization – complementarity of income of ecosystem participants, using the development of some ecosystem sectors as a basis for improving access to resources and expanding the customer base of others - was not observed in the ecosystem with a core in the construction industry of Ukraine.

The results of the calculations show that the characteristics of the economic activity of all ecosystem participants depend on certain conditions common to all. To such conditions we refer (based on the theoretical framework formulated in the first section) macroeconomic (dynamics of real incomes of the population and investments in new construction of enterprises and institutional investors – in the first place); institutional (primarily – regulatory and legal regulation of economic activity in general and specific sectoral); socio-political (mainly negative shocks experienced by Ukrainian society in the second decade of the eleventh century). Accordingly, there are signs of a fundamentally different nature of the driving forces behind the formation of a business ecosystem in the construction industry of Ukraine: it is not the sharing of the achievements of scientific and technological progress, the creation of an environment in which the possibilities of extracting benefits from the economic use of new technical principles and scientific achievements are realized - on the contrary, it is rather a search for forms of redistribution of the pressure of unfavorable social conditions among the participants of the ecosystem, which, unfortunately, is not accompanied by either an increase in production potential. This means that the interaction between enterprises within the ecosystem is characterized to a greater extent by competition for resources and effective demand (which in itself does not contradict the principles of ecosystemic business organization) and such competition does not lead to the spread of standards of leading enterprises and their groups to the periphery, but rather to the gradual concentration of resources due to the depletion of the resource potential of enterprises that are unable to shift the burden of inflation to consumers of their products.

CONCLUSIONS

1. The economic conditions for the formation of a business ecosystem with core in the construction industry of Ukraine are fundamentally and qualitatively different from those that express the fundamental driving forces of the formation of business ecosystems described in the literature. It is not the increase and dynamic renewal of the resource potential of industries, due to the facilitation of the introduction and scaling of innovations in economic activity, nor the reduction of variability and uncertainty that naturally accompany dynamic technological changes, but only adaptation to adverse macroeconomic shocks and significant gaps in institutional support that have become the main driving forces behind the formation of commonality (affinity) in the trends in the dynamics of value added generated in the industries participating in the studied ecosystem.
2. The ability of enterprises to protect the processes of reproduction of their resource potential from inflationary pressure (to raise prices faster than the prices of the resources they use) was, in the retrospective period, a decisive factor in the growth of the importance of the industry (group of enterprises) in the structure of the value added generated by the business ecosystem under study. The weight of the proportions of the distribution of inflationary pressure among business ecosystem participants is an extremely unfavorable condition for the formation of truly organic links between them. It reinforces the tendency to interact on the principle of a "zero-sum game", when the gain of some is formed through the additional costs of others, which fundamentally contradicts the concept of a business ecosystem.
3. The dynamics of the added value generated in the ecosystem, and comparing such dynamics between participating industries, indicate that the actual characteristics of the distribution of benefits from the functioning of the business ecosystem do not contribute to the growth of innovative activity of its participants and the improvement of socio-economic efficiency, in particular, the growth of housing affordability.
4. We associate the prospects for further research that will improve the quality of analytical support for state programs for the development of the construction industry and the growth of housing affordability for the population of Ukraine with the solution of two scientific tasks, which are summarized in the results of our study. First, to clarify the role of financial institutions and the existing institutional support for their functioning as an important component of the business ecosystem, the core of which is the construction industry of Ukraine. Secondly, further decomposition of the indicators used in the aggregate form (into five groups, which combine more than 80 types of economic activity)

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and a detailed analysis to more accurately identify the distribution of costs and benefits of the studied ecosystem between enterprises belonging to different types of economic activity.

ADDITIONAL INFORMATION

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CONFLICT OF INTEREST

The Author declares that there is no conflict of interest.

REFERENCES

1. Adner, R. (2016). Ecosystem as Structure: An Actionable Construct for Strategy. *Journal of Management*, *43*(1), 39–58. http://doi.org/10.1177/0149206316678451
2. Adner, R., & Kapoor, R. (2010). Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal*, *31,* 306-333. https://doi.org/10.1002/smj.821
3. Cai, J., Leung, P., & Mak, J. (2016). Tourism's Forward and Backward Linkages. *University of Hawaiiat Manoa*. URL: https://www.economics.hawaii.edu/research/workingpapers/WP_05-16.pdf.
4. Cella, G. (1984) The input-output measurement of interindustry linkages. *Oxford Bulletin of Economics and Statistics*, *46*, 73-84. https://doi.org/10.1111/j.1468-0084.1984.mp46001005.x
5. Davis, J. (2016). The group dynamics of interorganizational relationships: Collaborating with multiple partners in innovation ecosystems. *Administrative Science Quarterly, 61*, 433-468. https://doi.org/10.1177/0001839216649350?urlappend=%3Futm_source%3Dresearchgate
6. European Construction Sector Observatory (2021). URL: https://ec.europa.eu/growth/sectors/construction/observatory/objectives_en.
7. Eurostat, Conference Board INC. (2017). Handbook on Cyclical Composite Indicators for Business Cycle Analysis. https://doi.org/10.2785/962890
8. Ghosh, A. (1958). Input-output approach to an allocation system. *Economica, 25,* 58-64. https://doi.org/10.2307/2550694
9. Gulati, R., Puranam, P., & Tushman, M. (2012). Meta-organization design: Rethinking design in interorganizational and community contexts. *Strategic Management Journal*, *6*, 571-586. URL: https://www.jstor.org/stable/41524882
10. Iansiti, M., & Levien, R. (2004). The keystone advantage: What the new dynamics of business ecosystems mean for strategy, innovation, and sustainability. *Boston, MA: Harvard Business Press*.
11. IOC of the Ministry of Social Policy of Ukraine. (n.d.). URL: https://www.ioc.gov.ua/analytics/dashboard-vpo
12. Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a Theory of Ecosystems. *Strategic Management Journal*, *8*, 2255-2276. https://doi.org/10.1002/smj.2904
13. Jacobides, M. G. (2005). Industry Change Through Vertical Disintegration: How and Why markets Emerged in Mortgage Banking. *Academy of Management Journal*, *48*, 465-498. http://www.jstor.org/stable/20159671
14. Jacobides, M. G., Cennamo, C., & Gawer, A. (2015). Platforms, Ecosystems, Architectures: Rethinking the Aggregate? *Working paper*. URL: https://www2.uwe.ac.uk/faculties/BBS/BUS/Research/CENTIENT/ESRC%20seminar%204%20-%20UWE,%20Bristol/Michael%20G%20Jacobides.pdf
15. Jacobides, M. G., Knudsen, T., & Augier, M. (2006). Benefiting from Innovation: Value Creation, Value Appropriation and the Role of Industry Architectures. *Research Policy*, *35*, 1200-1221. https://doi.org/10.2139/ssrn.1309509
16. Kolot A.M. et al. (2023). The ecosystem of human resources of organizations as a concept and applied platform of human-centeredness. *Problems of Economics*, *3*(57), 282-291. https://doi.org/10.32983/2222-0712-2023-3-282-294
17. Kolot, A. (2024). Ekosystemnist yak imperatyv stijkogo lyudynovymirnogo rozvytku: preprynt. *Kyiv: KNEU*. URL: https://ir.kneu.edu.ua/handle/2010/43307
18. Kolot, A., & Herasymenko, O. (2021). Pratsia XXI: filosofiia zmin, vyklyky, vektory rozvytku (488 p.). Kyiv: KNEU. URL: https://ir.kneu.edu.ua/items/ee8cf399-8bcb-46ee84cb-ac6759b412df
19. Lopuschnyak, H., Chala, N., & Poplavska, O. (2021). Socio-economic determinants of the ecosystem of sustainable development of Ukraine. *IOP Conference Series: Earth and Environmental Science, 915*, 012019. URL: https://iopscience.iop.org/article/10.1088/1755-1315/915/1/012019
20. Omelchuk, D. (2025). Signs of ecosystemic development of the Ukrainian construction complex. *Collection of Scientific Papers "Scientific Notes", 39*(2), 196-212. http://doi.org/10.33111/vz_kneu.39.25.02.17.117.123
21. State Statistic Service of Ukraine. (n.d.). URL: https://www.ukrstat.gov.ua/

22. Williamson, P. J., & De Meyer, A. (2012). Ecosystem advantage: How to successfully harness the power of partners. *California Manage. Rev.*, *55*(1), 24–46. https://doi.org/10.1525/cmr.2012.55.1.24?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle

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ФІНАНСОВО-ЕКОНОМІЧНІ ПЕРЕДУМОВИ СТРУКТУРУВАННЯ ЕКОСИСТЕМИ БУДІВЕЛЬНОГО БІЗНЕСУ

Стаття присвячена перевірці гіпотез щодо узгодженості екосистемної концепції стратегічного розвитку бізнесу із завданнями наближення галузевих бізнес-моделей до принципів сталого розвитку та підвищення адаптивності належних до екосистеми підприємств, до змін технологічних, макроекономічних та інституційних умов функціонування. Було проведено аналітичне групування та кореляційно-регресійний аналіз для обґрунтування тези, що функції, виконувані галузями, залученими до бізнес-екосистеми з ядром в українському будівництві, мають суттєві відмінності порівняно з тими, що теоретично обґрунтовані в науковій літературі. Установлено суттєву різницю між фактичними рушійними силами й тенденціями формування екосистеми в економіці України та теоретичними уявленнями про закономірності розподілу ролей, вигід і витрат у процесі формування та розвитку бізнес-екосистеми. Зокрема, теоретичні тези про те, що розвиток бізнес-екосистеми надає додаткові переваги тим підприємствам і галузям, які беруть на себе більший тягар фінансування інновацій, не отримали емпіричного підтвердження. Було виявлено, що найкращі умови для відтворення ресурсного потенціалу отримали галузі, що займаються торговельним посередництвом, а ключові галузі для інновацій (діяльність у царині архітектури та інженерії) зазнали значного тиску через відставання темпів зростання цін на власні послуги порівняно з цінами інших учасників бізнес-екосистеми.

Ключові слова: бізнес-екосистема, будівництво, додана вартість, відтворення ресурсного потенціалу, галузева структура

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