SECTION 2. ECONOMICS AND MANAGEMENT OF THE NATIONAL ECONOMY

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2.1 Paradigmatic aspects of modern management: the development of the rental housing market in the perspective of the impact on it of the process of digitalization of the construction sector

Russia's military aggression against Ukraine were reflected in all spheres of society's life (this war is a war against the nation, humanity, a genocide of the Ukrainian people with a negative impact for many years), taking into account the great losses of the Ukrainian economy as a result of the actions of the aggressor country. According to separate data [22], as of July 2024, the indirect financial losses of the Ukrainian economy as a result of the full-scale russian invasion of Ukraine exceeded 1.1 trillion US dollars.

As a result of the actions of the aggressor country:

- significant destruction of infrastructure took place, which also led to additional economic costs, in particular: demining – 42 billion US dollars, housing sector – 22.4 billion US dollars (of which 15.4 billion dollars are additional costs citizens for rent housing), social payments – 10 billion dollars, dismantling of the destroyed objects – 13.4 billion dollars. [22];

- pronounced signs of a demographic crisis appeared as a result of large human losses and an increase in significant migration processes (Ukraine suffered from a demographic crisis even before the full-scale russian invasion – the low birth rate and high mortality worsened and, in combination with military losses and millions of refugees, created the prerequisites for the emergence of a demographic crisis [23]). Even before a full-scale invasion in 2021, the demographic situation in Ukraine is quite complex, at which time the UN recognized that the population of Ukraine is one of the fastest shrinking in the world, and is likely to decrease to 35 million by 2050. At the same time, as of the beginning of May 2023, 29 million people – this was the number of permanent populations: 17 million people – economically inactive population, 12 million – economically active [23].

Such a situation could not but have a negative impact on internal changes in the structural and sectoral dimension of the economy, real and financial sectors and the real estate market (as a satellite of the economy and one of the most significant segments of the financial market and an important component of the system of economic relations of the state) and, accordingly, its important component – housing rental market.

In such conditions, the housing rental market acts as an unofficial indicator of economic sentiments in the state - it reflects the expectations of the economically active part of the population regarding changes in the situation in the country and business entities regarding the prospects for the development of business activity in one or another market.

Thus, after the start of the full-scale invasion, it was the rental housing market that provided shelter for the majority of internally displaced persons (IDPs). Historically, rent regulation and tenant protection were among the earliest responses to the housing crisis after the First and Second World Wars in Western Europe and the United States [24].

Taking into account the socio-economic consequences of the shock induced by a full-scale war, changes in the situation of the housing rental market are catalysts for organizational and legal transformations in the state, in particular, in relation to issues related to the further development of the real estate market and the state as a whole, both in the post-war and the post-war period.

During the war, the regulation of the rental market is an important step in the direction of ensuring political and social stability and enabling the access of internally displaced persons (IDPs) to housing. A significant share of the destroyed or damaged housing stock is located in the occupied territories, which complicates compensation mechanisms. Given the speed and scale of forced displacement, new construction (social or private) is also unlikely to solve the housing problem in the coming years [24].

In this context, along with the leadership of the state, the real sector of the economy, and in particular the construction sector (which is the locomotive of the development of other branches of industry) and, accordingly, the level of its integration into the modern digital society, bear great responsibility.

Full-scale war became a catalyst for large-scale development of digital solutions in construction. The level of digitization of the construction sector of Ukraine in such conditions is characterized by a number of features:

- the level of implementation of digital technologies to improve business efficiency and speed up the process of integration into international digital markets. The development of digital skills, cloud solutions for state information resources and support for the "Digital Europe" program should be considered positive [25-26].

- the presence of problems in the construction sector, related in particular to a decrease in demand for new construction, especially commercial [27-28];

- risks of non-completion projects in critical terms due to disruptions in the supply of materials, a high level of inflation [27-28].

- the introduction of innovative approaches in construction and the involvement of international partners in order to promote the restoration of the industry, in particular with regard to the reconstruction of destroyed objects [27];

- the level of implementation of digital solutions in the reconstruction of objects using, in particular, construction management information systems (BIM) and other digital tools, which increases the level of cost planning and control over the progress of project works [26, 29].

- the scale of using drones and satellite data, in particular for monitoring damaged objects and risk analysis. This should contribute to ensuring the transparency of reconstruction processes and increasing the amount of investments [27].

Taking into account the above, it can be stated that the level of digitization of the construction sector significantly affects the effectiveness of project management and market recovery. Thus, the housing rental market is developing due to the acceleration of the reconstruction processes of objects and the increase in the transparency of the reconstruction processes and the increase in the volume of investments. At the same time, the use of such a tool as financial leasing contributes to increasing the level of trust in investment mechanisms and the introduction of digital platforms.

Taking into account the role and importance of the construction sector for the development of the economy, since it is in it that the main transformations take place due to the use of such tools as BIM, IoT, drones and process automation, which directly changes the methods of performing works in this area and their management.

With the implementation of digital platforms for rental management, the acceleration of reconstruction processes of damaged housing and the reduction of construction costs have a positive effect on rental affordability. At the same time, the use of financial leasing has a positive impact due to greater transparency of financial transactions in the construction sector, access to data about objects, as well as the development of digital platforms for concluding lease agreements.

The level of digitization of the construction sector has an indirect but significant connection with the housing rental market and financial leasing due to, in particular, the following aspects:

- digitalization promotes the development of rental and housing management platforms, such as mobile applications and online services. Thanks to these technologies, tenants get access to transparent prices and rental conditions, and landlords are able to automate the reservation and payment processes;

- the use of digitized systems increases the demand for new buildings with developed infrastructure and modern digital solutions, which is reflected in the increase in the cost of renting housing in such buildings, especially in cities such as Kyiv and Lviv, where construction activity is quite high [30].

- active use of financial leasing of housing, in particular in such programs as "yeOselia" – digitized platforms are used for processing documents and managing financial transactions, which generally helps to reduce barriers to purchasing housing and ensures the availability of conditions for a larger number of consumers [31].

In general, the use of technology facilitates operations for all market participants, reduces transaction costs and increases the transparency of financial schemes.

The relationship between the level of digitalization, demand for rent and financial leasing is reflected through the indicators of the adoption of digital platforms and changes in the cost of housing in different segments.

Digitization in the construction industry is impacting the rental housing market through the use of digital platforms such as mobile applications for housing search and rental; transparency of the processes of creating registers of available objects, automation of payments; growing demand for housing in new houses with the use of digital technologies (smart houses, energy saving through IoT).

Digitalization in the construction sector affects financial leasing through: simplification of the document process through digital platforms, which speeds up the process of drawing up contracts; use of electronic resources for risk analysis, payment monitoring and management of credit operations.

The relationship between the housing rental market and the level of digitization in the construction sector is reflected in the reverse impact due to demands on developers, such as:

- more technology in objects to increase competitiveness;
- contributes to the development of housing management technologies (smart apartments for tenants).

The relationship between financial leasing and the level of digitalization is manifested through:

- increasing the affordability of housing through the use of combined schemes, such as rent with subsequent purchase; transparency of contracts, which stimulates digitalization of financial processes;
- provision of credit mechanisms for new buildings, including modern digital solutions;
- development of platforms for monitoring crediting of construction projects;
- the spread of rent-to-own schemes, which stimulates the demand for technologically advanced housing;
- increasing trust in financial institutions through transparent digital platforms for transactions.

In general, digitalization stimulates the development of both the rental market and financial leasing through the following principles: transparency, efficiency and convenience. at the same time, the rental market becomes a catalyst for the introduction of modern technologies in construction, and this in general contributes to the simplification of the processes of signing agreements.

Given the essence of financial leasing of housing as a mechanism by which an individual or legal entity receives the right to use real estate with the possibility of its subsequent redemption after the end of the lease term and which, unlike a classic mortgage, does not require immediate registration of housing ownership, which makes it attractive for those who cannot immediately pay the full cost of the object, this approach is an effective solution for countries with a low level of access to bank credit and, accordingly, Ukraine, considering on significant losses caused by russia as a result of the war [32].

The role of digitization in the housing market under the terms of financial leasing is significant. Digitalization makes financial leasing more accessible and transparent.

Activation of the use of digitization in construction through: introduction of BIM technology (Building Information Modeling) contributes to shortening construction terms by approximately 20-30% and reducing costs by 10-15% due to more accurate design and cost forecasting [30].

As a result, the number of residential objects put into operation at an accelerated pace increases, which, in turn, increases the level of availability of rent and leasing; IoT in residential buildings contributes to the integration of "smart" systems (energy efficiency, remote control), which in general contributes to the increase in the cost of renting them by an average of 15-20%, but also the demand for them, especially in large cities.

In particular, the use of online rental platforms (such as: OLX, LUN, RIEL) contributes to the development of the housing rental market. There is also [33]:

- a reduction in the volume of the so-called "gray" market due to the automation of payments and registration of transactions through electronic services such as "Diia";

- the growth in demand for rental housing in restored facilities increased by 30-40% compared to the period before the full-scale invasion;

- the involvement of digitized credit processing mechanisms helps to reduce the average time of processing applications for mortgage loans, the use of mobile applications for monitoring payments and managing financial agreements.

In general, the use of digital platforms in housing management contributes to reducing the costs of tenants, reducing the risk of fraud on both sides, reducing the risks of projects, increasing the level of attractiveness for investors, etc.

Digitization of the housing market under the terms of financial leasing contributes to the simplification of the processes of conclusion of agreements, automation of document flow and the use of analytical tools for researching the real estate market. This creates new opportunities for both lessors and lessees, makes the housing market more accessible and efficient. At the same time, for the further development of digitalization, the issues of cyber security and the digital divide are important issues to be resolved in order to ensure equal access to digital services for all market participants [32].

In general, the extraordinary sphere is an important prerequisite for Ukrainian recovery and can become the so-called locomotive of the future recovery of the Ukrainian economy. After all, in Ukraine, after the victory, the main challenge for the state and business will be the large-scale reconstruction and restoration of Ukraine, which will contribute to the implementation of digital transformation (technologies that offer innovative solutions in the field of residential, industrial and commercial real estate throughout the life cycle will become relevant: design, construction, management and operation) [34].

Taking into account the trends towards the widespread implementation of digitization processes, digitalization of the construction sector in the case of using effective technologies and tools (which have proven themselves in countries that survived the war and achieved economic growth, such as: software for building modeling (BIM), sensors of the Internet of Things (IoT), artificial intelligence (AI), automation of processes and other technologies) will contribute not only to the improvement of the processes of design, construction and operation of buildings and structures, but also will create the basis for the recovery of the economy of Ukraine on an innovative basis [35-40].

Taking into account the above, it should be noted that the construction sector with the corresponding effective mechanism of its digitalization can play a significant role in the reconstruction of Ukraine both in the post-war and post-war periods, especially in the context of the development and implementation of investment strategies for recovery and have a significant impact on the housing rental market and exert a significant influence on the management of the economic security of the state.