# Impact of the COVID-19 Pandemic on the Housing and Construction Markets

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## INTRODUCTION

Currently, all major sectors of the economy, including construction, are experiencing the consequences of the COVID-19 pandemic. The crisis, which is not economic in essence, has shown the need to transform several areas, which will enable future adaptation to various crisis phenomena. The pandemic highlighted digital imperfections and critical errors that were made by economic actors and prevented the acceleration of market development.

The housing and construction markets were some such spheres. These are the areas where the interests of a wide range of subjects are coordinated. Thanks to the development of these markets, large lists of

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socioeconomic problems are being solved in various states. The housing and construction markets, as well as related industries, occupy a significant share of the country's economy.

To make an informed decision on the construction of residential real estate, a thorough analysis of information regarding both the construction procedure itself and the financing of the process actors (construction companies, home buyers) is required.

In the housing market, the interests of various subjects of these markets are combined and satisfied. The object of the research is the information infrastructure of the housing market; the subject is the economic relations formed in the housing market when making decisions on the construction and purchase of housing in the post-pandemic period. The aim of the study is to create an improved information infrastructure for the housing market in the context of the impact of the COVID-19 pandemic.

Within the framework of the study, it is planned to solve several problems:

- evaluate the existing information infrastructure of the housing market;
- explore opportunities to improve the information infrastructure of the housing market, taking into account the impact of the pandemic and the development of foreign markets;
- formulate the principles that the improved information infrastructure of the housing market should comply with under the influence of the COVID-19 pandemic;
- determine the impact of a developed information infrastructure on the functioning of the actors of the housing market, including in terms of their financing, in the post-pandemic period.

The hypothesis of the study is that improving the information infrastructure of the housing market makes the decision to build and purchase residential real estate more balanced and reasonable. In an era of the active digital transformation of the economy, alongside the ongoing consequences of the pandemic, a prerequisite for the functioning of any sector of the economy is the use of all information opportunities and ensuring the unity of approaches to the formation of information flows.

## Methodology

In theory, scientists and experts have long believed that all market participants and actors have access to all information in the same volume. However, this point of view caused certain doubts, in connection with which a number of researchers continued their research in order to prove or disprove such an assumption. Kenneth J. Arrow in 1963 was one of the first to show the asymmetry of information (Arrow, 1963). By 1970, George Akerlof had developed a market model with asymmetric information (Akerlof, 1980); the results obtained and further research led to Akerlof and his team being awarded the Nobel Prize in Economics in the early 2000s for analyzing markets with imperfect information. In 1962, George Stigler studied the possible relationship between information flows and the labor market (Stigler, 1962). William Vickrey's research was devoted to the formation of a new inheritance tax in Puerto Rico, the development of stages of action in progressive taxation (Vickrey, 1947). Another work devoted to taxation became the basis for the analysis of the profitability of the taxation system, taking into account asymmetric information flows, which was published by J.A. Mirrlees; also in 1997, his book "Information and Incentives: The Economics of Carrots and Sticks" was published (Mirrlees, 1997).

Another well-known scientist who conducted research on the influence of the asymmetry of information on markets was Josef Stiglitz. He analyzed the functioning of insurance companies and the influence of information flows on decision-making (Stiglitz, 1979). A mechanism of "reverse market adaptation" was developed, the essence of which was that informed subjects of market relations receive information from more informed ones. Together with Sanford J. Grossman, the influence of information asymmetry on financial markets (the Grossman-Stiglitz paradox) was analyzed (Grossman & Stiglitz, 1980). These were not the only studies on the asymmetry of information and its impact on different segments of the economy; others include Green (1973), Kihlstrom and Mirman (1975), and Fama (1970). As a result, most researchers concluded that the insufficient efficiency of markets was due precisely to the fact that not all subjects received the same amount of information.

Analyzing the works of various authors (Boyd, 2014; Mccord et al., 2011; Mingazova, 2013; Murzin, 2013; Osipov, 2019; Reed & Wu, 2010; Sazhin & Inchina, 2010; Shim et al., 2013; Zhu et al., 2017),

we can conclude that, as such, an analysis of the influence of the asymmetry of information on the housing and construction markets is not fully presented. However, in modern conditions—and especially in the post-pandemic period—this is especially relevant and necessary. This will improve the efficiency of transactions in the housing market for all entities.

The use of the comparison method made it possible to determine how exactly the existing information infrastructure of the housing market can be changed into such an infrastructure to become as efficient as is able. In addition, comparison with other foreign information infrastructures of the housing market can be made to search for those elements that can be adapted in Russian practice.

The method of analysis allows both an assessment the current state of the infrastructure and further study into what advantages and disadvantages can be obtained through improving the information infrastructure of the housing market. With the help of synthesis, the results of the analysis of the existing information infrastructure of the housing market were combined and used to build an improved information infrastructure.

The deductive method allowed us to accumulate all the available information and formulate informed conclusions about what the principles should be, and then which will correspond to the improved information infrastructure of the housing market.

Modeling made it possible to build the version of the information infrastructure of the housing market presented by the authors, as well as to present the need to introduce a single information center in post-pandemic.

Thus, the widespread use of research methods enabled us to obtain the highest quality research results.

## Results

The analysis of many studies made it possible to reveal that, as such, an approach to the definition of the information infrastructure of the housing market is not presented in the works. The presence of information asymmetry and its influence on economic actors has also not been fully investigated. The housing market, solving many socioeconomic problems, needs consistency and an effective information infrastructure of the market in the post-COVID economic revival era.

A prerequisite for the presence of asymmetric information on the market is the receipt of different amounts of information on the procedures for the construction and purchase of housing by market entities, as well as their interaction with financial markets.

If we evaluate the approaches to the definition of information infrastructure in general, then this is basically a list of various software products that can be used to collect information about the analyzed object. Of course, in this area, there may also be asymmetric information for different market participants. This is due, among other things, to different approaches to assessing the information provided. In the context of the digital transformation of the economy and the impact of the pandemic, the issues of information asymmetry are becoming even more relevant.

Information infrastructure in the housing market implies making the market more efficient. All the necessary information will be in a single center, including both information about private entities and information accumulated by the state. Thus, it will be possible to reduce the negative impact of the presence of asymmetric information. The multidirectional content of the data will be reduced to uniformity. In countries of emerging markets such as Russia, there is also a problem with the late provision of information from state organizations (e.g., Federal State Statistic Service of the Russian Federation (Rosstat)) (Osipov, 2016). There are organizations created by the state that concretize the collection of data in a specific segment (e.g., the mortgage market). However, at the same time, they can collect information from foreign organizations, such as Freddie Mac and Fannie Mae. Incomplete data also lead to information asymmetry.

It is the danger of getting into the risk zone that predetermines that market participants reduce their potential demand, or completely abandon transactions in the market. There are already problems with developers who cannot sell the constructed objects. The asymmetry of information is reflected in the formation of housing prices, which can affect the volume of its sales. This problem was especially acute during the pandemic.

An attempt to solve the previously mentioned problems may be just the creation of an improved information infrastructure, in which uniform information flows are assumed for all subjects of the housing market independently of lockdowns, pandemic, or the post-COVID era.

The multi-level housing market suggests that, to effectively build an information structure, it is necessary to start with a single-level information infrastructure system; after that, it is possible to gradually form the

final infrastructure to subsequently accumulate data into a single system. It is essential to consider the presence of regional subdivisions of state institutions that accumulate information about the market, as well as to focus on the procedures for accumulating information during crises, especially those not of an economic nature, as was the case during the pandemic.

The COVID-19 pandemic has shown that in many industries it was the lack of debugging in information processes that led to a slowdown in the procedure for obtaining information, a decrease in the efficiency of economic actors. It is essential to create a single platform as such, where economic actors and their interests will meet and where all information will be processed efficiently and promptly. It is important to include not only information on the domestic construction and housing market, as well as related industries, but also data on relevant foreign entities.

As a result, the information infrastructure of the housing market will provide its potential consumers with comprehensive information on the volume of construction, the value of land and real estate, interest rates on loans, other instruments for financing the construction and acquisition of residential real estate, data on market entities, as well as to reduce the number of illegal transactions. All this can be accessed only with the use of modern digital technologies. The pandemic pushed economic actors to use digital technologies to inspect and survey the objects, conduct negotiations and correspondence, and make other such changes, right up to online transactions using digital signatures and online filing of documents for state registration of rights.

Summing up, there are clear advantages of creating an effective information infrastructure for the housing market:

- the efficiency of obtaining data on the functioning of the housing market and the instruments for financing its subjects and transactions;
- transparency of the activities of all subjects of the housing market;
- the formation of an idea of the planned and forecast indicators of market development;
- access to a complete list of instruments for financing transactions in the housing market;
- increasing the attractiveness of the market for economic actors;
- the ability to quickly adapt markets to the consequences of the crisis, including those that do not have an economic essence (pandemic);

– development of housing and construction markets;
– the reduction of risks for economic actors, including individuals purchasing housing.

For the population, the information structure will allow them to have access to transparent, adequate information, which will allow them to make a more informed decision about investing in housing. It will also be a kind of tool for increasing the availability of residential real estate for citizens.

It is assumed that the information infrastructure of the housing market will be a built-in mechanism in the country's economic system. It is essential to create an information agency around which a mechanism for interaction between market entities will be built. This should further ensure the timeliness and completeness of information.

It is also assumed that the generated information flows should go to a single information agency, which will become the subject, which will present the data to interested parties. The formation of data should be carried out considering the parameters that will be set by potential users of information. It is important to consider that the structure must be adaptive. The adaptability of systems is one of the basic principles of the formation of effective systems for servicing the country's economy; the pandemic crisis has once again shown that.

The basic principles that the information infrastructure of the housing market on the example of Russia will comply with, considering international experience, are:

– the unity of the information base;
– wide coverage of information, allowing users to make an informed decision;
– operational information;
– ranking of information depending on the user's request;
– transparency of information;
– funding at the initial stages of operation for the creation of a news agency comes from state funds;
– online transactions without physical contact between people, which is important not only in a pandemic but also in a post-pandemic period.

Advantages of the news agency functioning in the system include:

– updating information for market entities;
– a high level of awareness of market entities about opportunities, including financing;
– growth in the level of demand from stakeholders;
– optimization of the level of various types of risks;
– reducing the volume of costs for market participants;
– more thorough justification of decisions on transactions in the housing market;
– increasing demand for various instruments for financing the construction or purchase of housing;
– transparency of activities of economic actors;
– creating conditions for reducing fraud in the housing sector.

There are, however, some disadvantages too, which should be highlighted:

– an increase in the amount of funding from the state to create a smooth operation for the agency;
– the complexity of the organization of this entity and ensuring the promptness of the provision of information by available information sources;
– the complexity of interaction with the subjects of the housing market at the initial stages of operation.

If the news agency is created within the framework of a national project, then it is also advisable to consider the regional structure of the country. The pandemic has shown that regions and their regional markets react differently to the consequences of the crisis, including the lack of digitalization of certain areas, which generally negatively affects the industry.

All subjects of the housing market are interested in the presence of an entity that will accumulate adequate, relevant information required for any transaction on the market. It is possible to envisage separate possibilities of financing from regional and local budgets, since the agency will operate not only in a single structure, but will also have branch offices in the regions (Osipov et al., 2020).

Summing up, we note that at present—after the pandemic and as different countries' economies recover from its consequences—it is required to significantly revise the processes in many sectors. The housing and construction market are no exception. Digitalization should solve several problems and reduce risks for market entities. Thus, any decision to build, invest, or purchase residential real estate will become much more justified.

## Discussions

It is expedient to assess the impact of the information infrastructure of the housing market on the decision to build or buy housing when creating a single information agency.

Figure 11.1 shows that the presence of an information infrastructure and a single information center that accumulates data makes it possible to improve the quality of the financing process, both from the state
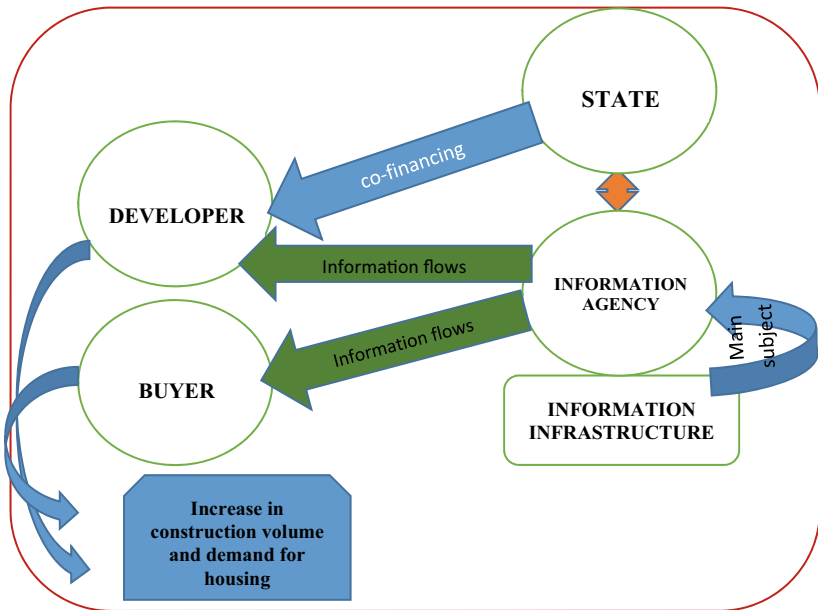


**Fig. 11.1** Analysis of the impact of the information infrastructure of the housing market on the decision to build or buy a home (*Source* Designed by the authors)

and from other subjects of the housing market. Information flows that come to prospective developers and buyers allow making an adequate and informed decision about the planned construction or acquisition of residential real estate. After collecting complete information, it is analyzed in a single information agency. Further, this data for a specific request can be provided to various market participants who are interested in its maximum level of quality and completeness. The figure shows that the state is one of the information providers, and at the same time a consumer. The information infrastructure includes all information flows from various databases. The data is redirected to the information agency, which accumulates and analyzes it, forming information flows that are uniform for all in terms of content. The information agency can contribute to the development of the housing market, effective financing of subjects and construction projects.

The complete database, which is collected by the news agency, allows the subjects of the housing market to obtain the effect of increasing the volume of construction and increasing the effective demand from buyers to a greater extent. The data will not be stored separately, which means that they will be uniform in content and in the time of receipt and processing. An important principle is the promptness of the information received; it is necessary to ensure that information is received in real time. This will be able to solve the problems faced by market actors when interacting with Rosstat. Analyzing foreign experience, in many developed countries, information is accumulated as much as possible in a single source, for the convenience of its consumers (Gutbrod, 2020; Osipov, 2021; Sidorenko & von Arx, 2020; Yankovskaya et al., 2020, 2021).

Evaluating the presented Fig. 11.1, we can say that a certain system is being formed that will improve the functioning of the market and increase the efficiency of transactions carried out in the market. Unreasonable costs can be excluded.

An information infrastructure that considers both the current state of the markets and current or possible crisis situations should provide not only constant information flows that are uniform for all entities, but also financial flows that will allow solving the problem of housing affordability for the population.

It is also essential to assess the impact of the unified information infrastructure of the housing market on the financing of its subjects, especially in the context of digitalization and crises that do not have an economic essence.

Analysis of the market and its digitalization makes it possible to conclude that it is insufficient, and the market needs a continuous digital transformation in the post-COVID era. This can be confirmed by the decrease in market efficiency during the pandemic, and the fact that not all market entities were able to quickly respond to the new operating conditions.

The digital transformation of economies will continue, and there is no certainty that new types of crises that do not have an economic essence will not appear. Each market must be ready for the urgent need to adapt to new conditions. In the housing market, it is the information infrastructure that can, considering all external conditions, enable the painless adaptation to new economic conditions and so provide comfortable conditions for market entities.

## Conclusion

Thus, as a result of the study, the following results were obtained and conclusions were formulated:

- the pandemic has shown the need for a serious digital transformation in markets, including housing, which solves a number of socioeconomic problems;
- the formation of a single information agency is required, which accumulates all information on the housing market and the possibilities of financing its subjects and objects into a common base;
- the information infrastructure of the housing market can have a significant impact on decision-making regarding the construction and purchase/sale of housing. The fragmentation of data creates an information "hunger." The presence of a single database makes it possible to increase the efficiency of the decisions made regarding the financing of the subjects of the housing market, especially in the context of the digital transformation of the economy.
- the influence of the developed information infrastructure on the functioning and financing of the subjects of the housing market was revealed, in the context of the digital transformation of the economy and the consequences of the COVID-19 pandemic, which suggests the possibility of a more effective redistribution of financial flows within the market, increasing its quality and ensuring the fulfillment of socially significant tasks of the state.

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