Analysis of Housing Investment Market Dynamics Impact on Social and Economic Development

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Abstract. The article is devoted to the dynamics of investment processes in worldwide housing investment markets, and issues of statistical data comparability in assessment of housing investments values. The authors conduct a research on relationship and interaction of housing investments and countries’ socio-economic development parameters. The influence of income indicators on the volume of housing investments is shown. The role of housing investments as a major factor of countries’ socio-economic development is justified; connection between housing investment and housing security, as well as housing investment and the human development index, which is a comprehensive indicator of the level of national economies’ development is revealed.

1. Introduction
The theory of investments and their impact on macroeconomics’ dynamics, which received major attention in works of the most influential experts on economic theory (Keynes, 1936; Samuelson, 1947 et al) and has been further developed in works of other researchers, is considered in the economic growth theory framework: firstly, through analysis of production functions, and, secondly, through the multiplier theory – using simulation of the multiplier function. Numerous studies carried out within the framework of these theories consider the impact of investments into fixed assets as the main factor of socio-economic development of countries and regions. That said, the authors mainly take into account investments into production, while investments into social infrastructure or housing are typically considered in connection with the analysis of human capital investment.

According to the authors of the given research, housing investments that are specific in purpose, implementation mechanisms, and relationship between entities play an important role in national economy, since they have a powerful multiplicative effect (T. Ovsiannikova, O. Rabtsevich, and I.A. Yugova 2017). Similar conclusions are made in similar studies of researchers from different countries who study the housing market and its impact on macroeconomics (Katsura, 1984), [3], (I. Eolokhova, E. Kozonogova, 2015). That is why governments in many countries are balancing between the risk of “overheating” the housing market with the emergence of “market bubbles” and the necessity to make local markets attractive for global investment. For example, according to the analysis (Dallas Rogers, Sin Yee Koh, 2017) of European Union, some countries (e.g. Spain, Greece, Cyprus, and Turkey) have introduced visa schemes for investors from Asia, Russia, and North America in an attempt to attract global capital to their local real estate markets.
2. Theory and methodology of research on the relationship between investment processes and socio-economic development parameters

Analysis of the relationship and interaction of investment processes dynamics and of territories’ socio-economic development parameters is carried out within the framework of various economic theories (approaches) using different statistical and mathematical methods and tools – statistical analysis (generalization and data analysis, statistical data grouping), mathematical modeling methods and, in particular, methods of correlation and regression analysis. The essence of all the approaches is to identify dependent factors, analyze the intensity and essence of the relationship between the studied parameters.

In order to provide the most comprehensive analysis of economies and ensure the objectivity of the research results, the analysis was based on economies of countries with different levels of socio-economic development and different types of economic structure. The analysis included a) developed countries – members of the European Union and OECD (Organization for Economic Co-operation and Development); b) developing countries – Colombia, Costa Rica, Indonesia, South Africa and the Russian Federation. In general, the study of 44 national economies was carried out – the coverage of EU and OESD member countries was incomplete due to the lack of relevant statistical data. Data analysis was mainly carried out for the period of 2000 – 2018. In case of absence of the relevant information, the period was adjusted accordingly.

The main issue in the process of conducting the research was the development of the information database for the analysis, particularly, search for and provision of comparable statistical data, which required using statistics from such organizations as Organization for Economic Co-operation and Development, Eurostat, World Bank, United Nations, Federal State Statistics Service of Russia (Rosstat).

The study of the relationship between investment processes dynamics in the housing sector and changes in the parameters of socio-economic development also required selection of statistical indicators to perform the analysis:

– housing investment index;  
– parameters (independent, factor variables) that influence the dynamics of the housing investment market;  
– parameters (independent, resulting) to assess the impact of housing investment on socio-economic development of countries.

As an indicator suitable for assessment of dynamics and volume of housing investments the Gross Fixed Capital Formation: Dwellings Indicator, characterizing the amount of investment in housing by residents of the country, excluding decommissioned housing stock for the reporting period was used [5]. To ensure comparability of data as the analysis was performed for different countries, the Indicator was calculated for the 12-month period in current prices of one currency (US dollars) at purchasing power parity – Gross Fixed Capital Formation: Dwellings; US Dollar (current PPPs) [5]. As Gross Fixed Capital Formation is not calculated by Rosstat, the Housing Investment as Part of Fixed Capital Investments Indicator was chosen to assess condition and trends in the development of the housing investment market in Russia [6]. In order to ensure comparability of data, this Indicator values were converted to US dollars based on the official exchange rate of the ruble against the dollar. Gross Fixed Capital Formation values per capita were determined to even out differences in the scale of national economies.

As the main economic entity of the housing investment market is the population (i.e. the economic behavior of households in the housing construction market largely determines the activity of investment processes in the housing sector) income indicator was used as an independent parameter. The Gross Adjusted Household Disposable Income, Us Dollars Per Capita Indicator was used to assess the level and dynamics of the population’s income. This indicator allows most accurate estimation of the amount of household income, as it is determined on the basis of income from various activities, taking into account paid dividends and excluding taxes and social contributions [7]. In order
to analyse the inequality in population’s income distribution, the Gini Coefficient, which characterizes the differentiation of household disposable income, was used [8].

To assess the impact of housing investment on the socio-economic development of countries two indicators were used:
- number of rooms per person;
- Human Development Index (HDI).

The population’s housing conditions indicator is utilized in the study due to the role of housing investments in ensuring housing adequacy. Housing conditions of the population are the result of the housing investment market development – changes in quantity and quality of the housing stock are determined by the quantitative and qualitative parameters of housing under construction. The research included the Number of Rooms Per Person parameter as the main indicator of housing security observed in international statistics.

The Human Development Index was used to assess the relationship between housing investment and the level of socio-economic development of countries as a whole. The Index is an integral indicator that allows comprehensive characterization of the level of health care, education, and country’s economy development [8].

3. Analysis of the relationship and interaction of housing investments and parameters of countries’ socio-economic development

As shown by the analysis of 2018, the largest volume of housing investment per capita among the CPAs considered was in the developed countries of Europe, Canada and Australia (Fig. 1). The top ten countries in terms of housing investment also included Indonesia, whose developing economy provided housing investment of 3139.9 US dollars per capita. In other developing countries in 2018 the volume of housing investment per capita was below the average (less than 1961.0 US dollars per capita).

Figure 1. Housing investment and local populations in 2018.
(source: calculated and constructed by the authors according to [5, 6, 10]).
The volume of investment directed to housing construction in Russia in 2018 was extremely low in comparison with other countries under consideration, only 222.9 US dollars of housing investment was accounted for per Russian citizen. Even taking into account methodological problems of comparing statistical data (i.e. necessity to select or calculate the most appropriate parameter for the indicator Gross Fixed Capital Formation for Russia), the volume of housing investment remains inconsistent with the scale of the national economy. For example, assessing the amount of housing investment not in terms of Housing Investment as Part of Fixed Capital Investment (defined by Rosstat, not on the full scale of organizations), but basing on its maximum possible value, using the amount of housing at current prices on the primary housing market (which is not consistent with the concept of Gross Fixed Capital Formation), the volume of housing investment, does not exceed 400 US dollars per capita (estimated by [11, 12]), whereas in countries with comparable populations the volume of housing investment exceeds that of the Russian Federation. For example, in 2018, in land-scarce Japan, the volume of housing investment was 1354.0 US dollars per capita with a population of 126.5 million people, in developing Mexico – 1229.0 US dollars per capita with a population of 126.2 million people (Fig. 1).

In general, there are similar trends in development of national housing investment markets – almost simultaneous changes in growth, decline, and recovery stages within economic cycles (Fig. 2).

![Figure 2. Growth rates of housing investment per capita in the world, as a percentage compared to the previous year](source: calculated and constructed by the authors according to [5, 6, 10]).

The increase in housing investment per capita in countries in 2000 – 2018 is due to an increase in the absolute volume of housing investment with a relatively stable population (Fig. 3). The highest rates of growth in housing investment were observed in developing countries, or in countries with a focus on social sphere development. Global economic crises have dramatically affected housing investment markets growth – in most countries for the period of almost 20 years there was only about a 2 time growth of housing investment. In Slovenia, Japan, Spain, Ireland, Portugal, and Greece, there was about or less than a 1 time growth in housing investment per capita in 2018 compared to 2000 (Fig. 3).
Despite the fact that the growth of housing investment per capita for the period of 2000 – 2018 in Russia was one of the most significant – in terms of the growth rate of housing investment in 2018 compared to 2000, Russia was on the 3rd place among 44 countries – the volume of housing investment per capita by 2018 did not reach the level of developed countries in Europe, America and Oceania, as shown above (see Fig. 1). In Russia, a significant increase in housing investment over the period of 2000 – 2018 is due to recovery of investment and construction activities in 2000 – 2010: the volume of housing construction increased from 30.3 million square meters of housing in 2000 to 58.4 million square meters in 2010 and amounted to 75.7 million square meters in 2018 [11]. The volume of housing investments in Russia is not sufficient to renew the housing stock and ensure adequacy and accessibility of housing. Cf: Russian average size of housing was 55.3 sq. m/unit (2017), while in Japan – 94.4 sq. m/unit (2015), in France – 81.5 sq. m/unit (2016), in Spain – 90 sq. m/unit (2016), and 94.0 sq. m/unit (2016) in the UK [13].

The growth rate of national housing investment markets in 2010 – 2018 was less significant (Fig. 4) – the median growth rate of housing investment per capita was 1.5 times.

**Figure 3.** Overall growth rate of housing investment per capita, population size and housing investment volume in the world in 2018 compared to 2000. (source: calculated and constructed by the authors according to [5, 6, 10]).
Figure 4. Growth rates of housing investment per capita, housing construction and prices in the housing market in 2018 compared to 2010. (source: calculated and built by the authors according to data [5, 6, 10, 14, 15]).

Although Russia ranked 3rd among the countries under consideration (see Fig. 3) in the growth rate of housing investment per capita for the period of 2000 – 2018, it was at the end of the rating in terms of growth rates for the period of 2010 – 2018. The dynamics of the housing investment market was drastically affected by the impact of the 2015 – 2016 foreign economic crisis: due to the peculiarities of construction production in Russia (such as long period of implementation of investment projects), housing construction is most affected by crisis phenomena and it takes a longer period of time to restore the pre-crisis dynamics in this sphere, which is most essential for the conditions of a developing economy.

The dynamics of investment processes in the housing sector is influenced not only by the actual growth in housing construction, but also by an increase in residential real estate prices – the price factor has had a significant impact on changes in volume of housing investment per capita in such countries as Iceland, Czech Republic, Austria, Mexico, South Africa, Portugal and Spain (Fig. 4).

Development of the housing investment market depends on the population’s demand for housing – the investment opportunities of households in the housing market determine the dynamics of housing stock renewal. Income of the population is one of the main factors that determine the activity of investment processes in the housing sector – a significant level of household income in developed countries determines the significant amount of investment directed to the renovation of the housing stock (Fig. 5). For example, in 2018 in Luxembourg with income of 47139 US Dollars per capita the size of housing investment was $4398 US Dollars per capita, in Canada – 35722 US Dollars and 3801 US Dollars, in Australia – 39220 US Dollars and 2963 US Dollars respectively, whereas in Russia with 19208 US Dollars per capita the volume of housing investments reached only 222.9 US Dollars per capita.
Figure 5. Impact of household income on housing investments: Gross Adjusted Household Disposable Income per capita and Gross Fixed Capital Formation: Dwellings, per capita (data on housing investments per capita is given in descending order of values; 2018, annual data; source: calculated and constructed by the authors according to [5, 6, 7, 10]).

While there is a direct relationship between incomes and volumes of housing investment, there is an reverse relationship between the Gini Index (a key indicator of not only population’s income differentiation, but also the level of socio-economic development of country as a whole) and the size of housing investment (Table 1). As shown by the grouping of countries according to the level of income and the value of the Gini Index, the average housing investment per capita increases with income and decreases with the Gini Index’s growth.

Table 1. Grouping of countries by volume of housing investment per capita, depending on the size and differentiation of income in 2018. (source: calculated and constructed by the authors according to [5, 6, 7, 10, 16, 17, 18]).

| Groups of countries according to: | Average value of Gross fixed capital formation: Dwellings, per capita (US Dollars) in the group |
|-----------------------------------|---------------------------------------------------------------|
| Value of Gross adjusted household disposable income per capita (thousand US Dollars) | Romania | Brazil | South Africa |
| Up to 30 | Hungary, Poland, Estonia, Greece, Korea, Rep., Mexico, Latvia, Russian Federation, New Zealand, Portugal | South Africa | 623.4 |
| From 30 to 40 | From 40 to Over 50 | | |
| From 16 to 26 | Slovak Republic, Slovenia | Brazil | 1152.2 |
From 26 to 36 Canada, Czech Republic, Denmark, Finland, France, Ireland, Netherlands, Sweden, Austria, Italy, Japan, Spain, United Kingdom

From 36 to 46 Belgium, Norway, Switzerland Australia, Germany

Over 46 Luxembourg, United States

Average value of Gross fixed capital formation: Dwellings, per capita (US Dollars) in the group

| Average growth rate of Gross fixed capital formation: Dwellings, per capita (US Dollars) in 2018 compared to 2000 | Corresponding group by income level (index, %) |
|---|---|
| Up to 1.5 times | 3.0 | 102.3 Greece, Italy, Korea, Rep., Russian Federation |
| From 1.5 to 2 times | 2.0 | 103.4 Australia, Austria, Belgium |

Dynamics of changes in the housing investment volume in countries is also related to changes in income of the population. For example, in the group of countries with income growth of less than 1.5 times in 2018 compared to 2000, the average growth rate of housing investment for the same period was 3 times, the average annual growth rate – 102.3 % (Table 2), whereas in the group of countries with income growth of 3 or more times in 2018 compared to 2000, the average growth rate of housing investment reached 5.2 times, and the average annual growth rate – 109.4 %, respectively.

Table 2. Dependence of the housing investment growth rate on the dynamics of population’s income changes. (calculated and constructed by the authors according to [5, 6, 7, 10]).
Housing adequacy is one of the main parameters of housing investment market development efficiency which confirms the direct connection between housing investment and housing security in the world (Fig. 6, a). Generally speaking, countries with a significant volume of housing investment per capita have higher indicators of housing security while countries with inadequate volume of housing investment demonstrate the opposite. For example, in 2018 the volume of housing investment in Luxembourg was 4398.3 US Dollars per capita and accounted for 3.1 rooms per household member, in the United States – 2385.7 US Dollars per capita and 3.8 rooms, in Japan – 1354.0 US Dollars per capita and 2.6 rooms, in Brazil – 608.6 US Dollars per capita and 1 room, in Russia – 222.9 US Dollars per capita and 0.9 rooms respectively.

In its turn, the adequacy of housing is an important indicator of the quality of life of the population which affects demographic, social and economic development of countries as a whole.

The impact of housing investment on economic development is complex and is manifested not only through development of investment and construction activities and the multiplier effect, but also through various socio-economic effects as a result of improvement of population’s living conditions. This is confirmed by direct connection between housing investment and the Human Development Index (HDI) (Fig. 6, b) – the increase in housing investment per capita volume causes growth of the Human Development Index value.
a) Gross Fixed Capital Formation: Dwellings, per capita and Average Number of Rooms per Household Member

![Graph showing Gross Fixed Capital Formation: Dwellings, per capita and Average Number of Rooms per Household Member](image)

b) Gross Fixed Capital Formation: Dwellings, per capita and Human Development Index (HDI)

**Figure 6.** The impact of housing investment on the dependent parameters:

- a) Gross Fixed Capital Formation: Dwellings, per capita and Average Number of Rooms per Household Member
- b) Gross Fixed Capital Formation: Dwellings, per capita and Human Development Index (HDI)

(data on housing investment per capita is provided in descending order of values; 2018, annual data; calculated and constructed by the authors based on data [5, 6, 9, 10, 19]).

The grouping of countries by housing investment also shows an increase in the average values of housing security and the Human Development Index with an increase in housing investment – in 2018, the group of countries with housing investment up to 900 US Dollars per capita had an average of 1.4 rooms per household member, and the average HDI was 0.816; the group of countries with housing investment from 3700 US Dollars per capita and more per household member had an average of about 3 rooms, the average HDI was 0.928 (Table 3).

**Table 3.** Dependence of housing security and the Human Development Index on the size of population’s income. (calculated and constructed by the authors according to the data [5, 6, 9, 10, 19]).

| Groups of countries in terms of Gross fixed capital formation: Dwellings, per capita (US Dollars) | Average number of rooms per person in the corresponding group of countries in terms of housing investment | Average HDI value in the corresponding group of countries in terms of housing investment | Countries of the corresponding group |
|---|---|---|---|
| Up to 900 | 1.4 | 0.816 | Brazil, Bulgaria, Colombia, Costa Rica, Greece, Latvia, Poland, Russian Federation, Slovenia, South Africa |
| From 900 to 2000 | 2.0 | 0.846 | Hungary, Japan |
| Year Range | Depreciation Rate | Details |
|------------|-------------------|---------|
| From 1600  | 2.5               | Lithuania, Mexico, Portugal, Romania, Slovak Republic, Cyprus, Czech Republic, Estonia, Ireland, Italy, Malta, Spain, United Kingdom, Australia, Austria, Denmark, France, Iceland, Israel, Korea, Rep., Netherlands, New Zealand, Sweden, United States, Belgium, Finland, Germany, Indonesia, Switzerland, Canada, Luxembourg, Norway |
| From 2300  | 2.5               | 0.896   |
| From 3000  | 2.5               | 0.921   |
| From 3700  | 2.9               | 0.887   |
| From 3700 and more | 3.0   | 0.928   |

The conducted research analysed dependences of housing investments on changes in the dynamics of economic development and confirmed the role of housing investments in socio-economic development.

### 4. Conclusion

The study showed the existence of a relationship and mutual influence between housing investment and other parameters of socio-economic development of countries. The analysis revealed the relationship between income indicators and housing investment: a direct relationship between the level of population’s income and housing investment, and a reverse relationship between the Gini Index and housing investment. These confirm the role of population’s income as the main factor determining investment opportunities of households in the housing investment market. The study of the impact of housing investments on the population’s housing conditions and the Human Development Index confirmed the importance of the housing investment market for socio-economic development of national economies. Increasing investment activity in the housing investment market is an essential condition for effective social and economic development in Russia and requires improvement of methods of state regulation.

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