Conceptual Approach to Studying Real Estate Market (as Illustrated by Krasnodar’s Real Estate Market)

A V Osennyaya¹, B A Khakhuk¹, D A Gura¹², N I Petel¹

¹Kuban state technological University, Krasnodar
²Kuban state agrarian University, Krasnodar

E-mail: gda-kuban@mail.ru

Abstract. Absence of databases compiled during the real estate market analysis poses a substantial problem and questions the integrity and validity of evaluation appraisals. This study is relevant due to its formal approach towards analyzing the real estate market, the necessity to accumulate relevant data and price factors, and taking into consideration the objectives of the appraisal. Use of insufficient or irrelevant data from reports on market/cadastral value poses a significant problem, which hinders practical implementation of modern economic processes and influences purchase and sales prices of real estate, as well as its taxation during cadastral appraisal.

The subject of this research is the real estate market of Krasnodar. The object of this research is the economic interaction taking place during construction, turnover, and development of real estate property. The authors have divided the territory of Krasnodar into zones and selected the most economically developed neighborhoods. These neighborhoods constituted the material of this study. The authors have also determined the pricing factors and their quantitative features. During this study, a database which may be used for real estate property appraisal has been created.

1. Introduction

Real estate market analysis is a separate type of activity which aims at:
- determining the viability of making investments into new real estate;
- determining the risk level of creditors financing the purchase of real estate;
- shaping the most promising real estate market segments;
- searching for assets with consistently high returns at a stable risk;
- determining the most profitable real estate market segments in the long term. Analysis is a study method based on assessing specific properties and features of an object under study. [1-3]

Experts single out various types of analysis. Methods of systemic analysis (i.e., hierarchy analysis technique, parametric technique, Delphi approach, brainstorming etc.) are becoming increasingly popular nowadays. As for the appraisal of real estate, the choice of methods of analysis should depend on the type of property being appraised and the type of its value (market or cadastral). Analysis is a tool for processing initial data both during modeling of cadastral value appraisal and during its comparison with market value. [4-6]
2. Materials and methods

When analyzing real estate market, one should focus on the type of property and may conduct either general or specific analysis. In the former case, the data which impacts real estate property’s value is analyzed. Among the factors analyzed are:
- property location;
- socioeconomic, political, and physical features influencing real estate property’s value on the country, regional, or city level;
- possible prospects of territory development which may stipulate the most effective use of real estate property and predict its obsolescence. [7-9]

Specific analysis considers real estate on the district and neighborhood level and deals with appraisal. For this analysis to take place, a database should contain relevant information regarding income levels for similar real estate property, construction prices, the complexity of procedure for obtaining construction permits, sales, sales conditions, motivation of buyers and sellers; the amount of offers, the level of property sales, and the degree of use of property before and after purchase. All this information will help to take a comprehensive look at socioeconomic and political context surrounding real estate property under appraisal. It is important to note that the analysis should be based upon accurate, valid, timely, and relevant data which also reflects general market trends. [10]

Besides, the analysis may be more detailed or less detailed. Foreign investors are more interested in general analysis which takes into account the entire country or the specific real estate property, while domestic investors would be more interested in the analysis on city, district, and neighborhood levels, as well as the comparative analysis of similar property. Based on general and specific analysis of the real estate market, an analyst calculates the value of real estate property using three basic approaches – expenses, income, and comparative analysis. Each of these approaches is based on a sum of appraisal principles. In order to perform expenses analysis, one should also account for land value when appraising real estate property's market value. [11]

An analytically intensive and costly approach to determining the market value of real estate property is the comparative approach. Within the framework of its application, it is necessary to analyze and select not only similar real estate property, but also pricing factors that determine the nature and degree of their influence on the final market value of real estate property under appraisal. As far the income and expenses analyses go, the former’s difficulty lies in calculating and forecasting future income (that is, the correct selection of the discount rate and capitalization ratio), and the latter’s difficulty lies in the selection of specific indicators influencing the value of real estate property under appraisal (that is, the calculation of the total cost of reproduction or substitution). The results of these analyses should be brought to appraisal date and take into account additional factor (for example, the location of real estate property in a particular climatic zone). [12]

In order to obtain the most accurate cadastral and market value of real estate property in Krasnodar, the city has been divided into zones. The borders of cadastral units were selected as borders between the zones.

3. Study results

For the purpose of subsequent analysis, we have selected 13 largest districts/neighborhoods of Krasnodar consisting of one or several cadastral units. These districts/neighborhoods are essentially city-forming. We have analyzed the level of infrastructure and predominant types of real estate property in these neighborhoods. We have also determined their quantitative features/price-forming factors such as the number of schools, kindergartens, hospitals, markets, malls, entertainment facilities, as well as the number and type of transportation routes. Results for smaller areas were not taken into account since their quantitative indicators were insignificant.

Yubileyny district is one of the newest, densest, and eco-friendliest locations in the western part of Krasnodar. It is confined to Alma-Atinskaya Street, Chekistov Prospekt, 70-Letiya Oktyabrya Street, and Dumenko Street. Modern secondary and high schools, art and music schools, kindergartens, and development centers are located in this neighborhood. This is a separate district with markets,
restaurants and cafes, entertainment facilities, hospitals, banks, drug stores, gyms, swimming pools, malls (Versailles, 5 Zvezd, and Yubileyny), and pedestrian areas. This neighborhood is characterized by modern engineering networks and high accessibility by public transportation. It is full of new residential buildings with spacious apartments with upgraded floor plans.

**KubGAU district** is located in the western part of Krasnodar near the Festivalny district. Its territory is restricted by the Arboretum on one side and main thoroughfares on the other. Plenty of schools, kindergartens, and hospitals are located in this area, as well as supermarkets, markets, and the Evropa mall with its movie theater. This district is lined with pre-engineered and newly constructed buildings. It is also characterized by the large number of private housing.

**Slavyansky district** is a residential area restricted to Kransykh Partizan, 2y Linii, and Gagarina streets. It is characterized by a large number of infrastructure objects like hospitals, a school, an orphanage, an arts school, and several kindergartens. This area is highly accessible by streetcars, buses, trolley buses, and taxi buses. The neighborhood is lined with Krushchev-era apartment blocks and 9-story buildings. More modern multi-story buildings are located near Akademika Lukyanenko street.

**Festivalny district** is one of the most convenient living areas in the entire city. It is restricted to Severnaya, Turgeneva, Dzerzhinskogo, Krasnykh Partizan, and Kalyayeva streets. Some of the peculiar features of this area are its integration into Krasnodar’s downtown, a large number of new housing projects, as well as numerous business infrastructure objects. A large number of social infrastructure facilities like kindergartens, schools, and medical institutions, including the Krasnodar Balneary, are located here. The neighborhood boasts several pedestrian areas, the Festivalny mall, restaurants, cafes, and shops. Offices of numerous companies on Krasnykh Partizan, Severnaya, and Dzerzhinskogo streets. The district is lined with new residential complexes, including business class housing.

**ENKA district** is an area in the northern part of Krasnodar. It is one of the most attractive residential areas of the city. Multi-story buildings located at Dzerzhinskogo street are considered a part of this neighborhood. It is compact, and all communication lines are isolated. Its territory houses several schools, kindergartens, educational and recreational centers, a swimming pool, gyms, a tennis court, hotels etc. The area is still in development, its architectural style is succinct as the buildings are predominantly built from monolithic brick. Housing complexes appear on previously undeveloped sites.

**9y kilometer** is a relatively small, but quite cozy and eco-friendly district, bounded by Dzerzhinskogo and Volgogradskaya streets. A school, a kindergarten, several hospitals, the University of the Russian Ministry of Internal Affairs, and a military recruiting center are located here. High transportation accessibility to the Krasnaya Ploschad mall, swimming pools, sports facilities, restaurants, and cafes is secured by the proximity of Dzerzhinskogo street. This area can be accessed by buses, trolley buses, and taxi buses. The neighborhood is lined with private residential buildings and two to five-story apartment blocks. Land plots are few.

**Tsentralny district** is one of the largest ones in Krasnodar. It is bounded by the Gorky Park, as well as Severnaya, Kubanonaberezhnaya, and Postovaya streets. There is a large concentration of cultural landmarks and facilities in this area, including the Drama Theater, the Youth Theater, the Puppet Theater, the “One Theater” project, “Premyera”, Kovalenko and Felitsyn museums, libraries, exhibition centers, the largest church in Krasnodar, hotels, restaurants etc. This neighborhood is also home to the Galereya-Krasnodar mall, the Book Center, the Krasnodar department store etc. There are general schools, arts and music schools, specialized schools, kindergartens, and gyms located in this district, as well as hospitals, a railroad station, and a bus station. The area is predominantly lined with one-story buildings. Premium living quarters are located near Krasnaya street. Streets are being repaired, and new large residential complexes are being built here.

**Moskovsky district** is a widely populated area bounded by Moskovskaya, Zipovskaya, Rossiyanskaya, and Solnechnaya streets. Due to the overpopulation of the area, there are not enough schools and kindergartens, but local authorities are trying to solve this problem. There are private
clinics and many types of transportation available. The neighborhood has a separate microeconomic zone, with Magnit and Lenta being the largest retail shops in the area. There are more than 35 18- and 20-story apartment buildings. Private housing and land plots for standalone residential housing are almost absent.

*Cheryomushki district* is one of the oldest ones in Krasnodar. It links the downtown with Komsomolsky and Gidrostroiteley districts. The area is rich with infrastructure. Kuban State University (located at Stavropol’skaya street), kindergartens and schools, sports facilities, and Vishnyaki market are located in this neighborhood. Stavropol’skaya street is the area’s main thoroughfare. Multiple public transportation routes, including streetcars, pass through the neighborhood. There are newer residential buildings being built at Selezyova street. However, the older residential quarters are also present. Further development of this area may be possible if the private housing areas are cut down.

*The Worsted and Woollen Products Factory district* is located between the Komsomolsky neighborhood and the cotton factory. One of the main advantages of this neighborhood is its transportation accessibility. It is crossed a by a street car line, which allows for traffic jam-free movement. Buses, trolley buses, and taxi buses pass through Komsomolskaya street. As far as the disadvantages are concerned... (пропущен кусок – прим. пер.). The neighborhood boasts rich retail infrastructure which includes a market, the Sormovka mall, furniture and textile stands etc. Low-rise buildings and the private sector prevail here; however, high-rise buildings may be found near Sormovskaya street, the area’s main thoroughfare. Since the area’s housing stock consists primarily of low-rise buildings built during the Soviet era, apartments may be purchased at an affordable price.

*Gidrostroiteley district* is one of the most promising and dynamic areas in Krasnodar, especially for purchasing an apartment. In 2018, this neighborhood was in the lead for the volume of real estate sold. This is the eco-friendliest area of Krasnodar: there has never been industrial production within the confines of this neighborhood. Markets, service facilities, gyms, and swimming pools are scattered throughout the area. Essentially this is an independent district with all amenities present. Several schools, kindergartens, and hospitals may be found in this neighborhood. There are currently 12 educational facilities located in this area.

*Komsomolsky district* is one of the most developed areas of Krasnodar and is located in its southwestern part. It is considered to be an independent district with 6 schools and nearly 20 kindergartens. There are large shopping and entertainment centers, restaurants, sports facilities etc. Multiple public transportation routes pass through this district, and it is convenient to reach any part of the city from here. Communication lines are partly outdated, but in general the area is well provided with engineering networks. A comfortable embankment and a green zone have recently appeared in the area. Despite the relatively dense development, the area is still actively developing as more monolithic-brick buildings appear here.

*Pashkovsky district* is a large area located between the Komsomolsky and Gidrostroiteley districts with predominantly green zones. This district boasts rich social infrastructure like schools and kindergartens. There is enough transportation coverage for this area.

There are more and more apartment block projects underway within the district. New residential complexes are being constructed at Gorkogo, Karasunskaya, and Sadovaya streets. Gated communities are also located there. Moreover, there are plenty of land plots with all communication lines in place.

Based on this study, a database was created to analyze a real estate market using the example of Krasnodar. The algorithm for developing a database consists of the following steps:

- analyzing real estate market;
- performing evaluative zoning;
- determining price factors;
- developing a GIS structure;
- completing a GIS database;
- analyzing quantitative indicators of pricing factors affecting the value of real estate property.
4. Discussion
To ensure the comprehensiveness of the market analysis, it is necessary to calculate a certain set of price factors which indicate current pricing, current supply and demand conditions, market activity level, as well as the liquidity of real estate property, which will determine the accurate value of a real estate property. Price calculation begins from evaluating products offered by competition and forming market supply. Then, the price may be recalculated based on demand. Market analysis makes it possible to predict the number of real estate property objects that will be sold as a newly offered product, as well as to determine the share of real estate in the market turnover. [13-15]

5. Conclusion
As part of the study, we have drawn several conclusions about the need to provide quantitative and qualitative features of real estate property, information on actual purchase and sales transactions, as well as the need for an appraiser to conduct an adequate analysis of the real estate market, taking into account the real estate type, its location, and purpose behind the analysis.

Real estate market of Krasnodar has been analyzed. Out of 48 districts, we have singled out 13 most developed ones. We have established five main indicators for the analysis. These are educational facilities, kindergartens, retail outlets, healthcare facilities, and types of transportation. Overall, we have determined Tsentralny, Komsomolsky, and Cheryomushki districts to be the most well-developed ones. The data obtained has been systematized into a single database, with the ability to monitor information depending on the situation on the real estate market.

Thus, despite the relevance of this problem today, the appraisal and analysis of real estate property is significantly complicated by the following factors:
- impossibility of obtaining reliable systematized data about the real estate market by the appraiser;
- the development of reports questioned by banks;
- the impossibility of accurately determining all values of the evaluated property;
- difficulties in calculating real estate taxes.

6. References
[1] Orhan Ercan 2020 A closer look at Turkish cadastre and its successful completion Elsevier, Land Use Policy doi.org/10.1016/j.landusepol.2020.104951
[2] Nikola Vučić,Mario Mađer, Saša Vranić,Miodrag Roić 2020 Initial 3D cadastre registration by cadastral resurvey in the Republic of Croatia Elsevier, Land Use Policy doi.org/10.1016/j.landusepol.2020.104951
[3] Andréa Oliveira da Silva Ricardo 2020 Augusto Souza Fernandes Smart governance based on multipurpose territorial cadastre and geographic information system: An analysis of geoinformation, transparency and collaborative participation for Brazilian capitals Elsevier, Land Use Policy doi.org/10.1016/j.landusepol.2020.104752
[4] Tarun Ghawana, Jason Sargent, Rohan Mark Bennett, Jaap Zevenbergen, Pradeep Khandelwal 2019 Subu Rahman 3D Cadastres in India: Examining the status and potential for land administration and management in Delhi Elsevier, Land Use Policy doi.org/10.1016/j.landusepol.2019.104389
[5] Monika Mika An analysis of possibilities for the establishment of a multipurpose and multidimensional cadastre in Poland Elsevier, Land Use Policy doi.org/10.1016/j.landusepol.2018.05.060
[6] Gura D A, Dubenko Y V, Shevchenko G G, Dyshkant E E, Khusht N I 2020 Lecture Notes in Civil Engineering book series Vol 50 pp 185-190 DOI: 10.1007/978-981-15-0454-9_19
[7] Gura D, Kuzyakina M, Gribkova I 2019 IOP Conference Series: Earth and Environmental Science Vol 403 Issue 1 19 December 2019 012176 DOI: 10.1088/1755-1315/403/1/012176
[8] Gura D, Dubenko Y, Markovskiy I, Pshidatok S 2019 IOP Conference Series: Earth and Environmental Science Vol 403 Issue 1 012185 DOI: 10.1088/1755-1315/403/1/012185
[9] Gura D, Dubenko Y, Dyshkant E, Pavlyukova A, Akopyan, G 2019 IOP Conference Series: Earth and Environmental Science Vol 403 Issue 1 012184 DOI: 10.1088/1755-1315/403/1/012184

[10] Gura D A, Markovskii I G, Hahuk B A, Pshidatok S K 2019 IOP Conference Series: Materials Science and Engineering Vol 698 Issue 4 044014. DOI: 10.1088/1755-1315/698/4/044014

[11] Shishkina V, Gura D, Gribkova I, Bykova M 2019 IOP Conference Series: Materials Science and Engineering Vol 698 Issue 6 066016 (Scopus) DOI: 10.1088/1755-1315/698/6/066016

[12] Kuziakina M, Gura D, Zverok D 2019 E3S Web of Conferences Vol 138 02004 DOI: 10.1051/e3sconf/201913802004

[13] Dubenko Y V, Gura D A, Dyshkant E E 2019 International Multi-Conference on Industrial Engineering and Modern Technologies FarEastCon 2019 8934179 DOI: 10.1109/FarEastCon.2019.8934179

[14] Kuzyakina M, Gura D, Sekisov A, Granik N 2019 Advances in Intelligent Systems and Computing Vol 983 pp 403-416 DOI: 10.1007/978-3-030-19868-8_41

[15] Gura D A, Shevchenko G G, Gura A Y 2016 Journal of Engineering and Applied Sciences Vol 11 Issue 13 pp 2885-2888 DOI: 10.3923/jeasci.2016.2885.2888

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