

ANALYSIS OF BID AND ACTUAL PRICES IN SEDLČANY

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Abstract

This work deals with the analysis and assessment of the offer and actual prices of housing units in the town of Sedlčany. This city is located in the Central Bohemia region, in the Příbram district. The subject of the analysis is the monitored period of two years, from December 2020 to November 2022. The analysis is supported by data from the real estate portals Sreality.cz and Reas.cz, where the offer and actual prices are found, which are entered in the real estate cadastre in purchase contracts. Furthermore, the analysis is based on a local investigation and information from the public portal of the Czech Statistical Office, the Land Registry and the website of the city of Sedlčany, more specifically on their flood plan. Within the monitored period, there are a total of 46 bid advertisements at an average price of 53,619 CZK per 1 square meter. For actual prices, 53 price data are calculated with an average purchase price of CZK 47,884 per 1 square meter. The total average prices differ, but also their development, for which a regression function is always created. Due to the development of the number of offers and their prices, also due to the presence of new housing units among older properties, the reliability value of the offer price model is very low. A higher reliability value can be observed for real prices, where the impact of housing units from the newly completed construction of an apartment building can again be seen. The goal of the work is achieved through an overall analysis and assessment with the conclusions that new buildings have a large impact on prices. The subject of further research will be adding information to the overall context of the issue.

Keywords

analysis; cadastral territory; price

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R31 Housing Supply and Markets

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Introduction

In the real estate market, as in other markets, there is supply and demand. The development of these two aspects often changes over time and depends on many factors. The offer is presented in this article by using the offer prices from the real estate portal Sreality.cz [1]. Against this are set the real purchase prices of real estate, which are stated in purchase contracts and entered in the real estate cadastre [2]. The city and cadastral territory of Sedlčany in the Central Bohemian Region are addressed in this work. As part of investigating the development of real estate prices, it is possible to monitor prices at the local, regional, national and international level. Analyzes and research are not only carried out by academic teams, but also by private entities from the field of real estate agencies or development companies. Various factors influence the price of real estate, and the location can be considered one of the basic factors. For this reason, the current analysis is focused on a specific city. Gentrification deals with the issue of local transformation, from a positive and negative point of view. Gentrification is a global process that includes real estate renovations, housing market speculation, increasing real estate prices, and general development of a locality, including through the development of shops, administration, and others [3]. The social culture of the given environment can also change [4]. An example from the Czech Republic, specifically from Prague, can be the Karlín district, which began to change after the floods in 2002. Local conditions, demographic development and the economic situation in the region is essential information for clarifying the context of the development of real estate prices, both offer and purchase prices. The real estate market is defined as a set of regional and local markets that differ significantly from each other in the level of prices, risks and efficiency of investments [5]. A study [6] dealing with sales through intermediaries states that in most cases it is not the first sale and such deals are carried out either directly by the owners or through real estate companies and real estate brokers. In the case of using an intermediary, the price also includes a commission, which is why the pricing of second-hand real estate is not completely transparent [6]. The advantage of information is on the side of brokers, who can better assess factors: market size, age of the seller, gender, married or single sales, payment method, number of rooms, age of the property, size, equipment, type of house, floor, metro (public transport) , schools [6]. The study [7] proves the connection between prices in the construction industry and real estate prices. However, it also depends on other aspects assessed in the given economy (country, region, city). The factors that are the driving forces of the increase in real estate prices may change in individual locations, even if the rate of increase is similar when compared to other locations [7]. It is clear that several factors influence real estate prices. The aim of this work is to assess and find the difference between the development of bid and actual prices in the city of Sedlčany.

Methodology

This paper tracks housing units in the city of Sedlčany for the period from December 2020 to the end of November 2022. Data on real estate prices are found, which are listed in the price data in the real estate cadastre. These data are made publicly available by the commercial entity in the price map *Atlas of prices* [2]. Information about offer advertisements is from the real estate website Sreality.cz [1]. Data on actual prices are entered gradually, by individual housing units, into MS Excel, where further analysis is carried out and a regression function is created. There are currently 4 advertisements for offer ads. The historical development in the monitored period is presented thanks to data from the real estate website [1]. This information is entered for comparison in the same MS Excel workbook, where a regression function is also created for this data. On the portal [2] with real prices, you can find information about the price, acquisition date, age of the building, unit number, descriptive number of the given building, the presence of an elevator, type of heating, and all this with a link to the land registry pages. There is not a lot of additional information - the technical condition of the unit, photos

or perhaps the ability to determine the orientation to the cardinal points. In the case of offer ads, more information appears, which can be handled differently. Apart from the prices, there are also detailed photos, operating costs, energy class of the building, type of ownership, information on the technical condition, equipment, heating sources, presence of a balcony, cellar or garage. Then the distance to civic amenities and services. When comparing the map and photos, the orientation of the view to the cardinal points can also be determined. However, the unit number is often missing, which makes it more complicated, especially for older properties, to find information from the cadastral price data, whether the given unit has already been sold in the past and for how much. As part of the analysis of offer and purchase prices in Sedlčany, information obtained about this municipality is presented on publicly available portals (Czech Statistical Office [8], Flood plan of the city of Sedlčany [9], Land Registry [10]). Price developments must be supported by additional information in order to clarify possible fluctuations or predict future developments. To support this research, a local investigation was also chosen to clarify the structure of the settlement, the technical condition of the real estate and the presence of civic amenities and tourism. The choice of a site for research is based on strategic location (transportation accessibility – road, railway, altitude) and economic assumptions. The Příbram district is also adjacent to the Pilsen and South Bohemia regions, which supports economic conditions and economic development. Sedlčany is part of the Central Bohemian Region, Příbram District. The district town is approximately 34 km away. Sedlčany is chosen because of the optimal location for research within the Czech Republic. The town is located on the connecting road, highway No. 18, between the D4 highway leading to Příbram and the highway No. 3, which gradually connects to the D3 highway. On this road, the distance from Sedlčany is around 13 km. The city is also located near the Vltava River, where there is significant tourism. Even the Sedlčany themselves are part of the developed tourism in this locality. There are several museums, national monuments and interesting nature in and around Sedlčany.

The map [11] shown in Figure 1 is also helpful for the analysis of the town of Sedlčany. It is a map [11] with marked places of civic amenities. The location of the town in terms of traffic is also evident. An important east-west connection between highways passes through the edge of the city, while a north-south connection passes through the center of the town, dividing it into two halves.

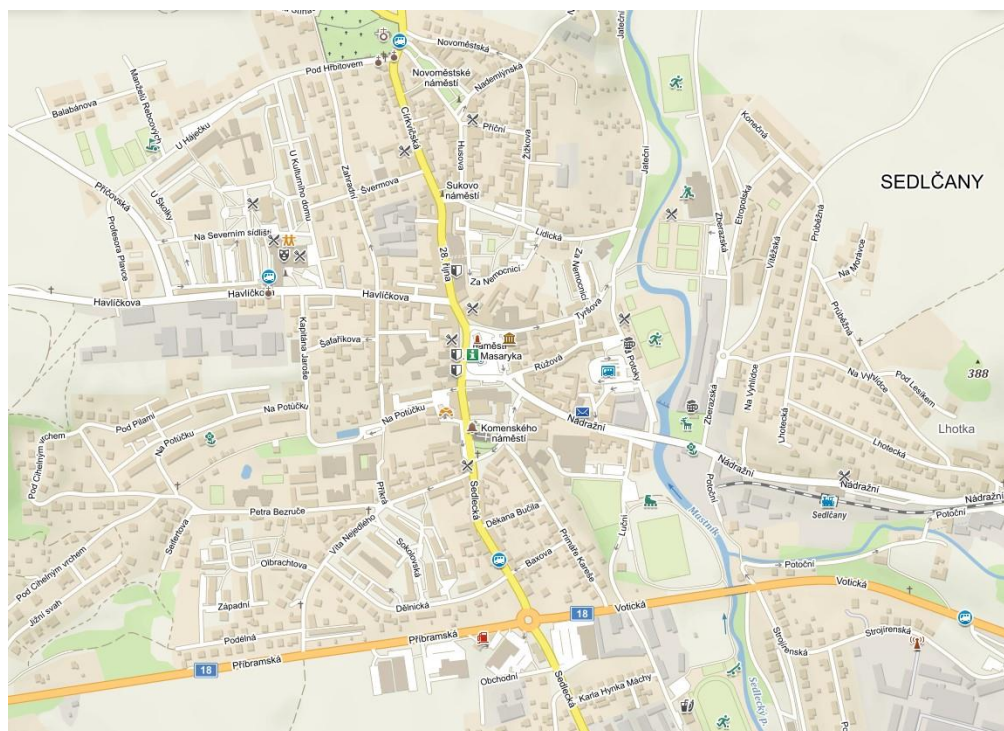


Figure 1: The map of Sedlčany (source: authors with use of [11])

Due to the presence of a watercourse, the city of Sedlčany has prepared a flood plan [9]. Based on a local investigation, it can be stated that it is a full-fledged city with available services and civic amenities. The structure and space of this settlement is very similar to other smaller municipalities. The development is mostly low with respect for the environment.

For the next phases of the research, it will be important to monitor the data of other factors that influence the bid and actual prices. Due to the fact that factors are often repeated in foreign academic studies, Table 1 with the influencing factors is presented here, namely from the Housing Concept of the Czech Republic 2021+ [12]. Here the factors are divided into supply, demand and other factors. It is therefore obvious that even the division of factors may differ in different papers. The concept [12] describes individual factors in a general way. Therefore, behind each factor mentioned, a range of other factors can be found for which data can be searched/collected.

Table 1: Main factors affecting residential real estate prices (source: authors with use of [12])

<i>Supply factors</i>	<i>Demand factors</i>	<i>Other influences</i>
Approval processes	Economic performance	Media influence
Technical regulations in the construction of apartments	Attractiveness of regions and job opportunities	Foreign economic development
Spatial planning	Purchasing power	Expectations and mood
Tax policy	Demographic factors	Psychology of people
Affordability of building land	Interest rates and regulation	Political developments

For example, Prices and availability of building land or Interest rates and central bank regulation. The first mentioned factor deals with the price level and at the same time availability, which can be assessed by financial, social or supply parameters. The second mentioned factor monitors the development of interest rates and, at the same time, tools for regulating not only the mortgage market, such as credit indicators.

The following are the results of the analysis of the offer and actual prices, i.e. a comparison of data from two real estate portals with the addition of additional information from a local survey or from a publicly available portal.

Analysis results

In the city of Sedlčany there are mainly smaller family houses or cottages and apartment buildings. Most of the apartment buildings are paneled, but there are also older brick ones. In 2022, the construction of an apartment building in Tyršova Street will also be completed, and other houses are under construction. Flats are subject to both offer prices and purchase prices from the real estate register. Based on a local investigation, it can be concluded that this is a quiet location with mostly repaired buildings. Most of the prefab houses underwent revitalization of the facade and replacement of windows. Apartment buildings with photovoltaic panels are also found. The Mastník watercourse flows through the town, which is partially captured by a retention reservoir in the southern part of the town. Based on this flow, a flood plan [9] is drawn up, in which endangered objects are mentioned, which also has an impact on the price of concrete real estate (e.g. apartment building No. 348, houses No. 170, 337, 1155 or Sedlčany municipal office, commercial buildings, sports complex, Nádražní Street, etc.).

The town also includes industrial production areas, shops, sports fields, a cultural center and a hospital. The presence of the hospital is interesting from the point of view of the low number of residents, because it is not only a health center. The development of the number of inhabitants is shown in table 2. The current number of inhabitants as of 31.12.2021 is 6,799 citizens with permanent

residence in Sedlčany [8]. The total number of inhabitants decreases over the years, which is mainly due to a higher number of deaths than births [8]. In the framework of immigration / emigration, there is neither an increase nor a decrease [8].

Table 2: Population status as of 31.12. (source: authors with use of [8])

Year		2017	2018	2019	2020	2021
Total population		7 147	7 080	7 029	6 922	6 799
In that according to the gender	Man	3 405	3 371	3 340	3 295	3 260
	Woman	3 742	3 709	3 689	3 627	3 539
In that aged	0-14	984	972	978	948	938
	15-64	4 539	4 455	4 360	4 290	4 166
	65 a více	1 624	1 653	1 691	1 684	1 695
Average age		44,1	44,5	44,7	44,9	45,1

Thanks to data on the development of the population in the town of Sedlčany, a decrease in population can be observed, especially in the working age. Due to the strategic location and the presence of industrial sites, the economic potential of this region is high. This thesis is also supported by the planned completion of the D3 highway from Miličín to Prague, which will improve transport accessibility to Sedlčany. The decline in the population of working age also has an impact on the number of households that are able to purchase their own housing using a mortgage loan. The reason may also be the older age of the applicants or low savings.

Figure 2 shows two basic pieces of information about tender advertisements from the Sreality.cz website [1]. This is the number of active advertisements (red points with the axis on the right) and the average bid price per 1 square meter for the respective month (blue curve with the axis on the left). As of early December 2022, there are only 4 active listings on the site [1], 3 of which are from completed new construction. Thanks to the presented advertisements of housing units from the new construction of an apartment building, an increase in the average price is noticeable. There are now more new apartments on offer than apartments from older buildings.

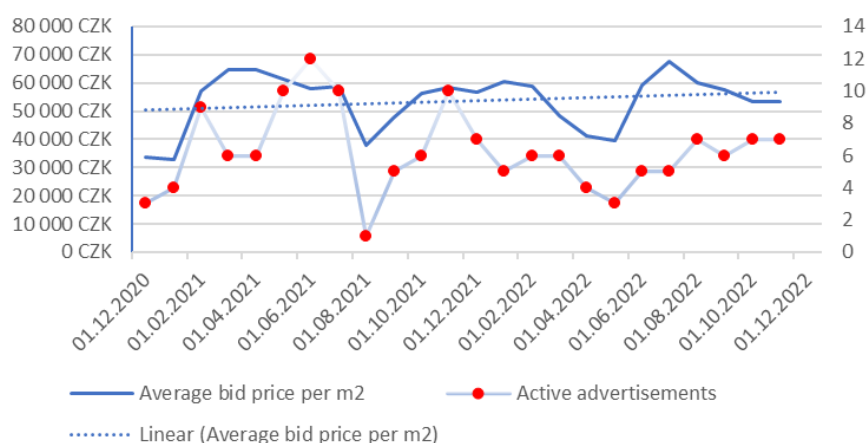


Figure 2: Development of average bid prices and number of active advertisements (source: authors with use of [1])

Two fluctuations are evident from Figure 2. A one-month in 2021 and a gradual several-month in 2022. This second swing can be attributed to unclear developments in the energy market and general uncertainty in the financial markets and in Eastern Europe. If the new apartment building is not

completed, it can be assumed that the number of offer ads will decrease or simply stagnate. The average price for 1 m² in the observed period is 53,619 CZK. Furthermore, the average duration of advertising is 53 days [1] with the number of 46 new offers, while each ad was displayed an average of 63 times. The development of bid prices is also described by a linear regression line with a reliability value of R² equal to the value of 0.0358. The regression function is described as follows:

$$y(x) = 8,6912x - 333274 \quad (1)$$

Where x represents the date of submission of the offer, which is converted to a general number as part of the calculation in MS Excel. The reliability of the model is minimal, which may be due to the one-time occurrence of offer advertisements with new housing units. It is not possible to clarify the issue of repeated sales from the data obtained in more detail. However, it can be generalized as shown in Figure 3.

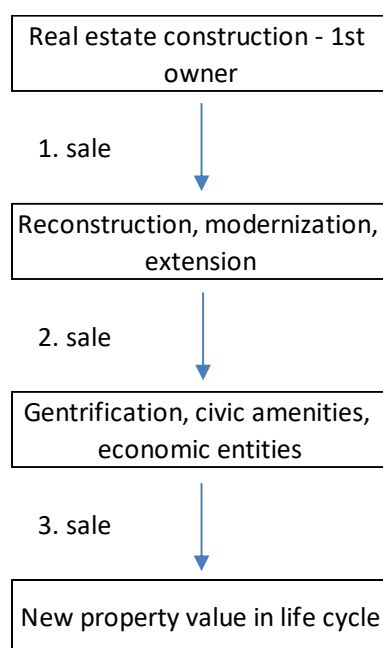


Figure 3: Life cycle of marketable real estate (source: authors)

At the beginning, it is always a new construction, which has a higher value than older real estate. However, over time, this particular property can be sold again, so it enters the real estate market, but due to its age and possible technical modifications, it is no longer a property in the same condition as in the first case of the first purchase. The price will change (not only according to market conditions). The new owner can modify the property or leave it in the condition in which it was purchased. However, during the lifetime of the property, its immediate surroundings change – transport accessibility, changes in civic amenities, etc. This is a process of gentrification, when the price of the property can decrease or, on the contrary, increase. Any third sale (deal with specific real estate) is thus again affected. When monitoring a longer period of time, the same property appears in the data set more than once, which can influence the conclusions of research at higher levels - regional, national and international. When investigating smaller settlements, such as this research in Sedlčany, these properties and their repeated sales can be addressed. However, the current research did not find a property that was sold more than once in the defined period. This means that even for purchase prices from the real estate register, only one price data is entered in the monitored period.

This is the beginning of the description of the purchase prices from the real estate register, which are entered in Figure 4. These are the actual purchase prices expressed in Czech crowns for one square meter of the given property. Since these are data from purchase contracts, the exact dates of sale are known [2]. This is one of the differences between actual and bid prices, where the figure is always

calculated at the end of the month. For real prices, a faster increase in the price per square meter is more noticeable. At the end of the monitored period, there are approximately 10 apartments from the new building, which is also the subject of the latest offer advertisements. The blue points below the regression line towards the end of the monitored period are also large-scale new apartments. The obtained data also show that as the area of the housing unit increases, the price per square meter decreases. The rate of growth or decline is not identical, but the dependence exists. The average real price for 1 square meter is 47,884 CZK. In total, 53 real prices are published in the town of Sedlčany [2]. There were 46 new offers, so it can be stated that the number of purchase contracts corresponds to the offer. Some properties do not have to be offered publicly and are still subject to sale. In addition, there are offers before the monitored period, the trade of which could only be realized in the monitored period. The average area of one housing unit is 60.72 m², which corresponds to the dimensions in the offer advertisements.

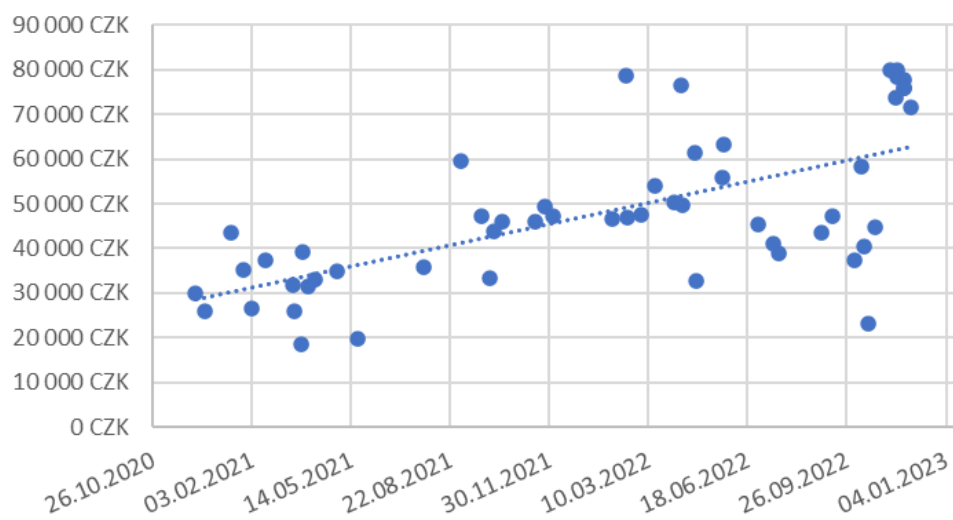


Figure 4: Development of real estate purchase prices (source: authors with use of [2])

The linear regression function has a R^2 reliability value of 0.434, i.e. 43.4%. This is a higher model accuracy than bid prices. However, thanks to the higher number of new housing units on the local real estate market, the assumption of price growth, or rather their stagnation at the current level, can be very well assumed, even at a time when the financial situation is uncertain. As already mentioned, this is a strategic location that offers a quality environment for life not only in terms of job offers, but also health care, nature or transport accessibility. The regression function has the following prescription:

$$y(x) = 47,477x - 2\,068\,808 \quad (2)$$

Where x again represents the date of acquisition of the property. Here, the values on the x -axis correspond to the actual date according to the purchase contract. There is no regular duration between the monitored dates, as with bid prices. Figure 4 also shows that the same number of sales was not made in each month. Although the reliability value of the model is higher than that of the offer model, it still does not even reach 50 %, and therefore it is necessary to assess possible predictions of future development with a margin, also taking into account the current state of the European economy and the energy crisis, which has an impact on all areas and also to the construction industry. A functional construction market is a prerequisite for a functioning real estate market.

The prices within this model differ in terms of the total area of the housing unit. When assessing prices in terms of area, i.e. not date, the tendency is slightly downward. The essence of the research, however, is monitoring the development of prices for 1 square meter of any size housing unit.

The section of the cadastral map of Sedlčany, which is in Figure 5, displays information on whether a price data is entered for the given property [10]. In other words, you can find out here whether the property in question has been traded. Certain periods or dates can be tracked since the beginning of entering this information. In Figure 5, the deals for the years 2020, 2021 and 2022 are marked. The plots for which the price information was given are marked in green. The red hatch shows housing units with price data, and the red fill indicates sold buildings.

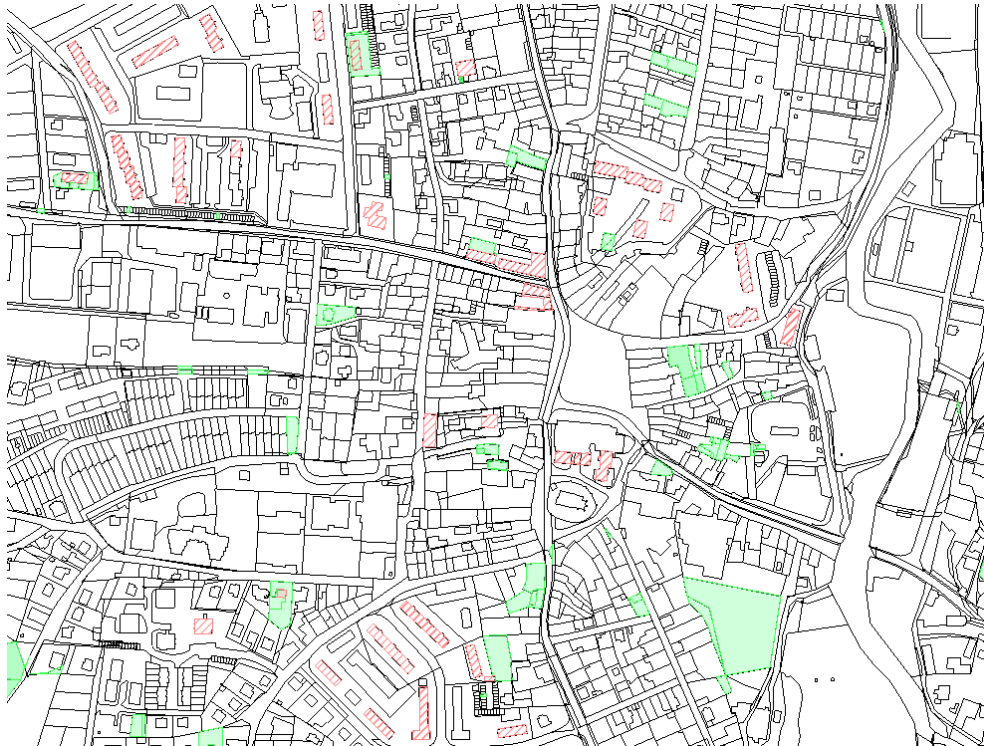


Figure 5: Cadastral map with marked properties with listed price data (source: authors with use of [10])

There are no housing units in cooperative or similar ownership among the offer advertisements. All bid ads present a sale for personal possession. This fact corresponds to the data from the real estate register, since the sale of the cooperative share is never recorded in the real estate register, since the housing cooperative is the only owner [10]. That is, of course, in the event that the cooperative share is not transferred to personal ownership by purchasing the share. Some housing cooperatives provide this option based on their statutes. Within this article, the comparison of bid and actual prices is complete, while in the future it will be supplemented with new information and data.

Conclusion and discussion

The subject of this article is the analysis of bid and actual prices in the town of Sedlčany in the Příbram district in the Central Bohemia region. The monitored period is December 2020 to November 2022. First, the location and locality of the city is described, which is based on map documents and a local investigation. Further, the procedure is based on two real estate portals Sreality.cz [1], where there are bid advertisements with bid prices and Reas.cz (Price Atlas) [2], where there is a price map consisting of individual details of purchase contracts (purchase prices), which are included as a price data in the real estate cadastre. This is a public portal where the data is available free of charge, even if this data is charged if it were drawn privately directly from the Cadastral Office of the Czech Republic. However, it is a commercial entity that also develops other commercial activities in the field of real estate trading and determining the value of real estate. The data from the portal with actual prices is checked against the documents directly in the cadastral map, where it is stated to which units the price

data was attributed in the monitored period. The analysis shows that the supply corresponds to the demand, while the demand is beginning to exceed the supply, as there are fewer properties on offer, but purchase contracts are occurring further. If it is possible to purchase real estate in the town of Sedlčany, there is a high probability that the apartment unit will be sold. A total of 46 new offers were registered during the monitored period at an average price of CZK 53,619 per 1 square meter. On the other hand, 53 items with actual prices are recorded at an average purchase price of CZK 47,884 per 1 square meter. The average price therefore varies, however, towards the end of the monitored period, a completed new building with residential units intended for sale appears in the offers. As part of the data on real prices, these apartment units do appear, but generally in a smaller number than they are offered so far, so the sale may be realized with a delay. When comparing the offer price and the actual price of these housing units, it can be concluded that the offer price is higher than the actual or purchase price, i.e. The price that is stated in the purchase contract. The growth rate of bid prices is lower than the growth rate of actual prices. It also means that prices are not driven up by high demand and are resolved through auctions. The rate of growth in real prices is determined by the completion of new construction at the end of the monitored period. The analysis shows that the price of new housing units is slowly up to 2 times higher per 1 square meter compared to older real estate in the monitored period. The aim of this work was to assess and find the difference between the bid and actual prices. The subject of the research was this goal achieved, while as part of the ongoing research in the area of real estate prices, the factors that influence them and the development of price levels, it will be continued in other similar municipalities. Additional information will be added that has an impact on the outputs from the analyses. As already mentioned, this is a very complex industry, where data cannot be separated from each other, but on the contrary, information can be added. The construction of an apartment building in a town with almost 7,000 inhabitants has a significant impact on the price level and the development of both bid prices and actual purchase prices.

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