



DETERMINANTS OF SILESIAN DWELLINGS VALUE ON THE EXAMPLE OF STOREY-DEPENDENT VARIABILITY

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Abstract: This paper considers determinants of Silesian dwellings value in aspects depended on storey variability. Polish law defines three different types of flat ownership. Except for the market attribute dependent on type of floor level there are many different value attributes. The type of the ownership law and time trend must be designed to be able to find such a low impact level that would oscillate within the limits of several percent. The article aims to evaluate which parts of the floor level are value dependent and point the price differentials. The results of the research are based on the data set collected from over than 14 000 sales occurring in regional Silesian market from August 2017 to August 2018. Knowledge of the various laws and characteristics of the real estate market is the basis for making diversified decisions related to the management and trade of real estate. The percentages make it possible to calculate, inter alia, the price which is different between groundfloor, the first/last floor and attic flats.

Keywords: dwellings, market value, storey-dependent variability, valuation

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Introduction

Dwellings is one of the most dynamically developing segments of real estate management. They are perceived as capital investments which attract the interest of investors and developers operating on the real estate market, who are focused on obtaining utility or financial benefits. Residential units fulfill elementary and social needs of people. This market has been dominated by extremely nuanced transaction prices. Acquisition of real estate for living needs is an important and difficult decision, which often has to be made by an individual investor, due to the considerable diversity of the housing market.

The main aim of the study is to characterize the elements that play an important role in shaping the price of residential units in the Silesian Voivodeship. In order to implement the problem, on the basis of a literature review, the characteristics of housing market and preferences of potential buyers were presented. The research part directs the analysis of factors which influence the price, especially the floor level dependency. The subject of the analysis were residential properties located in Silesian market. The study covers years 2017-2018, as in this period a sharp increase in prices of residential units in Poland was observed.

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Characteristics of the residential flat real estate market factors

The market belongs to the basic and most frequently discussed economic categories. It is a very broad and diverse concept, therefore it is extremely difficult to define it clearly. The real estate market is a form of contact between buyers and sellers, in order to establish the terms of the transaction, i.e. the manner, place and time of its execution, the amount of equivalent or other compensation and the fulfilment of the legal arrangements behind the transaction. This is the totality of the relationship between sellers and buyers who demand, as evidenced, by purchasing power (Kucharska-Stasiak 2006, p. 38).

Valuers should use the following definition of market value directed by legislation: *“The estimated amount for which the property should exchange on the date of valuation between a willing buyer and a willing seller in an arm’s length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without being under compulsion”*².

The market is also a sphere within which price formation mechanisms operate, where the change of ownership title is most often accompanied by the movement of the goods being the subject of the transaction. In the literature of the subject, the real estate market is defined as:

- a set of mechanisms by means of which rights and shares in real estate are transferred, prices set and different ways of land use are transferred,
- all conditions under which transfer of rights to real estate takes place and agreements creating mutual rights and obligations are concluded, combined with the ownership of real estate (Kucharska-Stasiak 2006, p. 57).

The presented definitions have many common elements. The real estate market is a structure comprising an assembled set of interrelated participants in the processes of offering and exchanging real estate and the conditions under which these processes are carried out. The set of participants in the real estate market consists of exchange entities characterised by specific features, exchange objects and elements of the market. The specificity of the real estate market results from the characteristics of the real estate and the rights to own it. Investment decisions made on the real estate market are characterised by certain specific features. These include above all: high value of the real estate, high share of foreign capital, long period of use, low liquidity of the real estate, deficit, imperfection, uniqueness and a large scope of state intervention. The elements of the real estate market functioning are: ownership rights, security of transactions, freedom of circulation and participation in market mechanisms of all interested parties, location of real estate (Budzik-Nowodzińska 2016, p. 99-107).

The latter element is assessed mainly from the subjective point of view of the parties to the transaction. Regardless of the subjective colouring of the assessments made, the tendency to satisfy the needs dominates. It is particularly visible in economic development and the increase in the financial possibilities of the society caused by it. Therefore, the attention should be paid to other factors conducive to the

² Due to a legal definition of *European Valuation Standards 2016*.

development of this specific market, such as the level of prosperity, inflation, savings, market openness, the development of technical progress, the economic situation and the situation on the real estate market, as well as the element of subjective expectations, i.e. speculative activity (Bryx 2007, p. 17-18; Brzozowska, Galych 2015, p. 21).

An extremely important factor influencing the functioning of the real estate market is the price, which largely determines the size of the real estate supply and the demand. The higher the price, the richer the offer. A low price discourages customers, and thus has an impact on supply reduction. The specificity of the market is a reflection of specific real estate prices, which are an extremely capital-intensive investment, and any increase in usable area is long-lasting and costly. As a result, a quick reaction on the supply side to the price increase is practically impossible. The functioning of the residential real estate market is characterised by such factors as:

- the universality of housing needs - needs can be met through the acquisition of the right of ownership or the right to rent a dwelling, with the result that this market is not a single market and includes a user-owner market and a user-rental market;
- the duality of the functions of the dwelling - the social and economic function (i.e.: investment of capital, instrument for increasing capital);
- the different legal framework compared to other sectors of the real estate - reflects the interrelationship between the other sectors of the economy (i.e.: investment of capital, instrument for increasing capital - the different from that of the other sectors of the economy).

The different legal framework compared to other sectors of the real estate is an expression of state intervention, with spatial planning and tax policies that can encourage land accumulation, price increase and the provision of land for building development as instruments of this interventionism. The price can be measured by the value of a property, regulated as the most likely price that can be obtained for the property in a freely operating market.

The value of a property is influenced by a variety of factors, the methodology of which can be presented in the following way:

- physical and environmental factors - characterised by the material characteristics of the natural and man-made environment;
- economic factors - include the forces acting on the demand and supply of real estate and the proportions between them;
- legal factors - freedom of participation in transactions, freedom to trade in real estate, system of taxes and charges related to real estate and property ownership, system of tax reliefs for investors, etc.;
- demographic factors – including forces acting on the demand and the supply of the real estate and the proportions between them;

The impact on the value of the real estate is also determined by many different factors which can be systematically expressed as follows: - demographic factors, social factors - lifestyle, fashion, habits, real estate environment, neighbourhood,

availability of services, availability of shopping and production centres (Kucharska-Stasiak 2006, p. 69).

At the same time, it is not uncommon for analyses to raise the problem of the direction of dependence between infrastructure and growth and development. Theorists look for an answer to the question whether the changes taking place in infrastructure are the cause of changes in the sphere of growth and development (it is the increase in infrastructure that causes the increase in GDP) or whether it is as a consequence of growth and development that changes in infrastructure take place (it is the increase in GDP that makes changes in the sphere of infrastructure necessary) (Ławińska 2009, p. 36).

Each valuation must be carried out by, or under, strict supervision of, a Qualified Valuer. Valuers will at all times maintain the highest standards of honesty and integrity and conduct their activities in a manner not detrimental to their services, their public, their profession, or their respective national professional valuation body. The valuer must be able to show professional skill, knowledge, diligence and ethical behaviour appropriate to the type and scale of valuation and must disclose any factor which could compromise an objective assessment. Each valuation must provide an informed and independent opinion of value supported by a recognised basis or bases of valuation (EVS 2016 bluebook p. 45).

The evaluation of indicators shaping property prices is associated with risk. Knowledge of risk makes it much easier for investors to operate in a competitive market and make informed decisions. However, recognizing, assessing and manipulating it is very difficult, especially due to limited information about a given market and low value of this information (Sitek 2010, p. 44).

Property Price Determinants

An old principle associated with the price of a property is 'location, location and location'. Nevertheless, time and technology changes have modified the old price paradigm. The better the utility functions are, the higher the price to be paid for a property becomes. Therefore, it is crucial to identify these functions. Generally, prices can be divided into the implicit or the explicit ones. Studies on property price agree that there are three major determinants which expound or modify price variation. It is suggested that residential properties are multidimensional commodities featured by durability, structural inflexibility and spatial fixity hence these characteristics set the price. Though it is not possible to get ideal information on the decision to purchase a flat which involves a substantial capital outlay that will be driven by an effort of collecting as much information as possible. The most commonly available information that usually buyers rely on can be roughly categorized into physical characteristics, locational and neighbourhood attributes.

The structural or physical characteristics such as the floor, the number of rooms were strongly related to the price. Other attributes include the age as negatively correlated to the price. The importance of location has long been recognized as main property price determination. The location of a property has been regarded in terms of fixed and relative locational attributes. On the one hand, some aspect of location

can be accurately quantified. On the other hand, some surrogate measures, such as socioeconomic class, social composition, and aesthetics attributes, pollution levels and proximity to local amenities, are used. Accessibility, which is normally measured in terms of access to the central business district have some influence on housing prices. The positive effect of transport accessibility on housing price shows that buyers are willing to pay more for properties with easy accessibility to public transportation.

To sum up, there are three determinants that are normally associated with the price. These are factors related to the structure, the location and the neighbourhood. These factors will be considered in property investment decision making.

These are the most important factors one needs to consider when valuing dwellings:

1. The market - the current state of the housing market will also influence a flat's value. For example, if there is a shortage in the available dwellings and there are plenty of people looking forward to move to a specific area, prices will rise. If the overall national economy is doing well, flat prices will increase as well.
2. Location - people are looking for family oriented communities with good schools and shopping malls.
3. Neighbourhoods - the neighbourhood is one of the biggest influencers of a unit's value, decisive for both qualitative and quantifiable aspects of a dwelling's appeal. Crime rates are negatively correlated with flat values in the neighbourhood.
4. Age and condition - typically, newer flats appraise at a higher value. Most buyers expect a well-maintained unit in good condition and will pay a top price for a move-in-ready dwelling.
5. Size and appeal - a flat's size has a major influence on its value, with some prospective homebuyers looking specifically at the price per a square meter filter out this effect and to determine the value. Bigger flats tend to be sold at higher prices, of course.

Firstly, the reporting of floor bonuses has been largely accidental so far. "Floor," "level" or "storey" are only included as control variables for investigation of other cases. As such, there is no analysis of this particular finding, i.e. whether it is linear, nonlinear, monotonically increasing by floor, etc.

Table 1. Attributes of dwelling properties

Market attributes	Evaluation	Description
location	worthwhile	location in the centre of the district, availability of shopping and service centres, public facilities and the main public transport node
	average	location outside the centre of the district, medium-intensity region, availability of retail, service and public utility facilities
	below average	Location on the outskirts of the district, partially urbanized region, limited access to commercial, service and public utility facilities

standard of premises	high	flats with advantageous and innovative architectural solutions, oversize standard of workmanship and equipment, advantageous interior aesthetics
	satisfactory	premises with typical architectural solutions, average standard of workmanship and equipment, typical interior aesthetics
	average	premises with unusual and unfavourable architectural solutions, below the average level of workmanship and equipment
technical condition	fine	building erected in traditional technology, the standard of workmanship satisfactory, normative course of current and capital repairs. The degree of usage does not exceed 30%
	satisfactory	building erected in traditional or industrial technology, average workmanship standard, average range of current and capital repairs. The degree of usage does not exceed 50%
	below average	building erected in traditional or industrial technology, low standard of workmanship, limited scope of current and capital repairs. Degree of usage more than 50%
functionality	high	advantageous and modern functional solutions, full range of auxiliary rooms (e.g. toilets, WCs, cellars, balconies, terraces)
	satisfactory	typical functionality of living quarters, average availability for auxiliary rooms
	reduced	dwellings with low functionality of rooms, limited availability for sanitary facilities and auxiliary rooms
floor location	fine	I-st floor
	average	middle floors
	below average	ground floor and last floor

Source: Own study based on the conducted survey

Data source

The data source for this study comes from the sale of over 14000 dwelling units sold in the Silesia market in last year (from 08.2017 to 08.2018). Real estate professionals involved in the residential real estate in Silesia generally classify three distinct sub-markets or “neighborhood” in the area. These markets are indentified as the Katowice agglomeration, and Bielsko-Biała/Częstochowa districts. The Core is the traditional location of Katowice and contains mostly commercial high-rises.

The site and structural characteristic variables include age, number of bathrooms, bedrooms, and square footage of the unit, which have been found to be important predictors of housing prices. Location characteristics include mock ones for each of the neighborhoods as well as the variable of interest, “floor,” and related variables

such as floor-squared, total number of floors in the condominium, and a top-floor, “penthouse” indicator. There is a large variation in the size of the buildings, with several ones at four/five floors, and the highest with 12 floors. Higher locations were thrown out of analysis to reduce view-price effect. Comparing this sample to other locations such as Hong Kong, or even New York or Berlin, the average high-rise condominium in Katowice is relatively low. Similar variation exists in the characteristics of individual common flats. Their sales prices range from slightly more than 100,000 to over 500,000 zł. The average flat has a floor area of around 50 square meters, but there are units with as few as 16 square metres to as many as 160 square meters. The average total number of floors in a flat is 5,71.

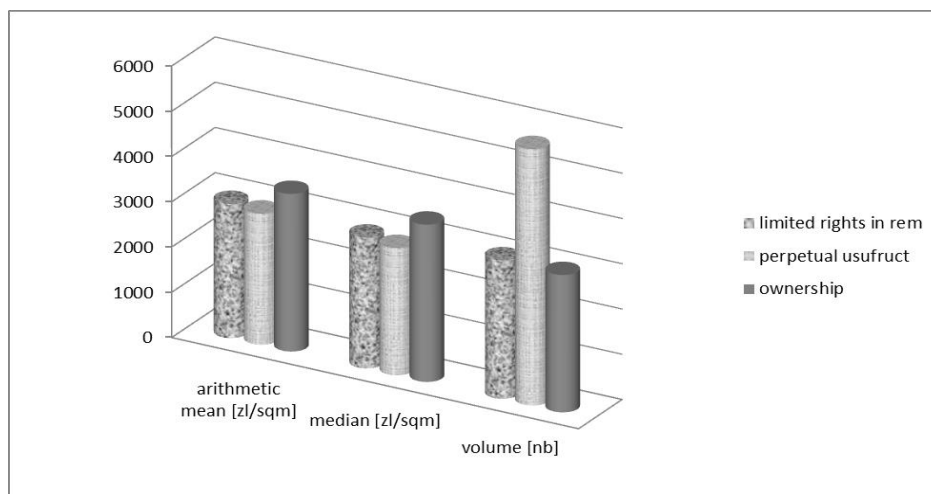


Figure 1. Types of property rights in the sample

Source: Own study based on the conducted survey

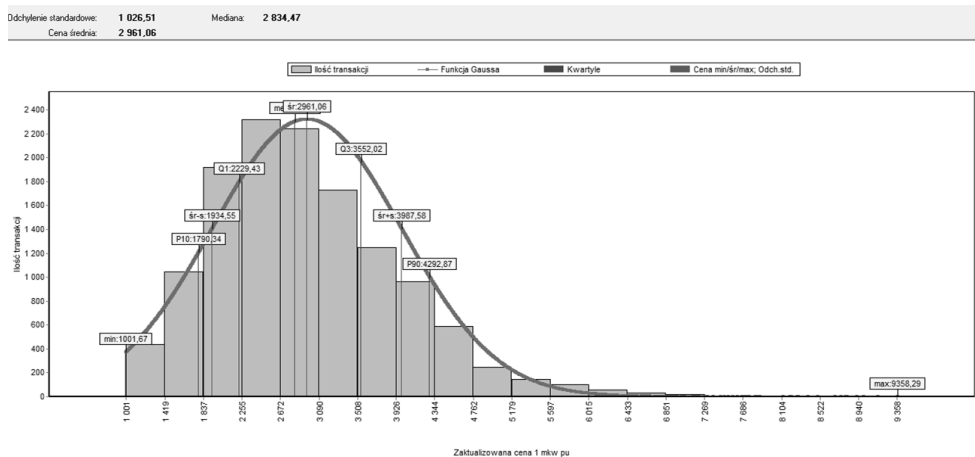


Figure 2. Gauss distribution of the sample [price in zloty]

Source: Own study based on the conducted survey

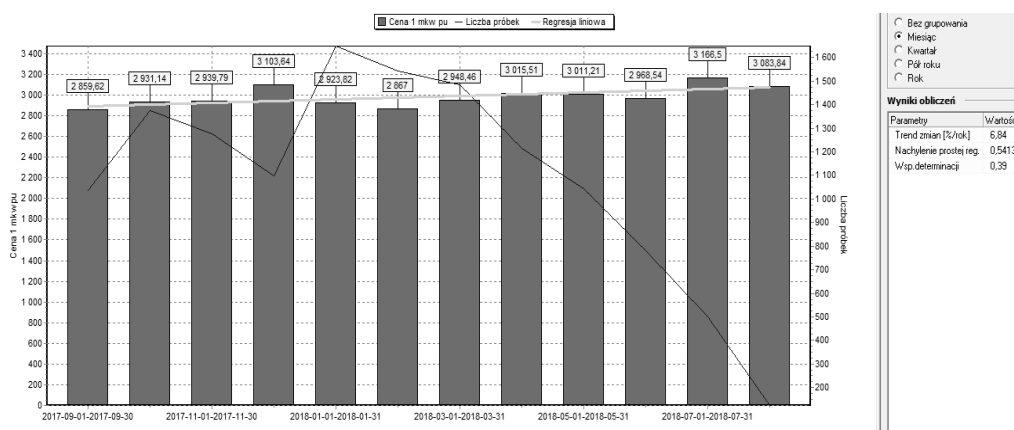


Figure 3. Time trend [% per year]

Source: Own study based on the conducted survey

The R-Square value is essentially a measure of the predictability of the model (i.e. Independent variables in relation to the dependent variable). The R-Square value can range from 0 to 1 where 1 would represent a perfect correlation between the independent and dependent variable(s). Here the 39% of the changes on the dependent variable are explained by volatility of price in time. For further calculations, the correction resulting from the trend 6,84%/year was taken into account.

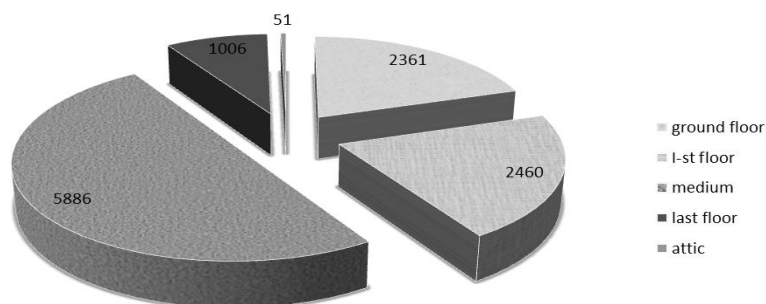


Figure 4. Number of flats per floor

Source: Own study based on the conducted survey. Medium is a middle floor dependent of building type

Conclusions

The real estate market is influenced by a variety of factors, whose intensity can change over time. It is important to know the degree of the influence of factors in general, but a higher interest of individual real estate market agents is apparent in periods when it accelerates or stagnates more. The favorable development of the Silesian economy, which constituted the basis for positive expectations for the population and growing willingness to procure housing also by means of relatively

easily available credit sources, has been the main factor to contribute substantially to considerable increase in the prices of flats. The Silesian real estate market recorded a relative boom in recent years. The growing housing demand was not saturated by an adequate supply, which led to a relatively dynamic growth of residential property prices. The situation changed in the 2nd quarter of 2008 when the real estate market gradually stagnated and prices decreased between the individual quarters as a result of external and internal influences.

The paper provides a descriptive picture of the development of a set of indicators that have significantly influenced the development of residential property prices in Silesia in the last year. At the same time, it represents an important step towards subsequent regression analysis, which will enable to estimate the regression coefficients or elasticities for the individual explanatory variables with respect to the explained variable – the residential property price. The selection of an appropriate model can also set a stage for deliberations on the prediction of the development of residential property prices in the following quarters.

The residential real estate market is shaped by the features and attributes specified in the descriptive part of the study. The results of the research indicate the volatility of the price level, depending on the location of the apartment in relation to the storey. The manner of determining the characteristics also influences the level of variability. However, there were no differences in the level of influence depending on the law form of ownership. Due to significant discrepancies in the final part of the study, calculations based on arithmetic averages of prices and medians were indicated.

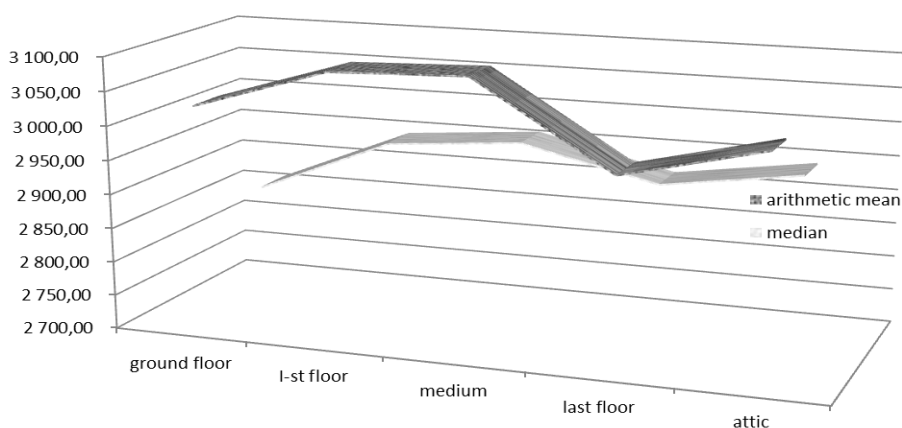


Figure 5. Chart of unit price volatility depending on the storey

Source: Own study based on the conducted survey

Every activity on the real estate market requires a good knowledge of its functioning, knowledge of the laws it is governed by, and the possibilities of development of this specific market. In order to have good knowledge of the real estate market in a given area, a thorough analysis should be made by identifying the mechanisms, structure, state and development of its components. The results of such an analysis are then used by participants in market transactions, as well as by persons

and institutions making investment decisions. To sum up, the obtained results point out that the factors having the greatest influence on the number and price of transactions (on the examined local market) were demographic, location and physical conditions. First of all, the prices of residential units were mostly influenced by the usable area of the unit, the location of a multi-family building in relation to the city centre and the related level of social infrastructure development. Prices also depended on the attractiveness of the location and environmental conditions, the number of rooms, as well as the floor on which the residential unit was located. An important attribute influencing the number of transactions was also the external image of the housing estate, which is determined by the fashion for neighbourhood, security and a status of residents.

The techniques employed in in this paper are basically adopted from financial and economic ones. The techniques can be easily categorised as property valuation and property analysis. The valuation methods address the need to state the worth of property whilst property analysis aims at explaining the pricing mechanism. The advanced analysis techniques are, however, based on performance measurement and incorporation of statistical tools. The approach allows more factors and situations to be taken into consideration.

In this model a “floor” variable was included. In addition, the “penthaus effect“ was found in the model. Economic theory implies there may be two competing forces affecting the decision to live on higher levels of a building. On one hand, higher-level floors are associated with longer travel times within a building and hence higher implicit travel costs. However, there may also be positive amenities associated with living higher up such as less traffic noise, better views, etc. Results presented here generally confirm those of prior investigations. Flats located on higher floors are associated with higher-sales prices.

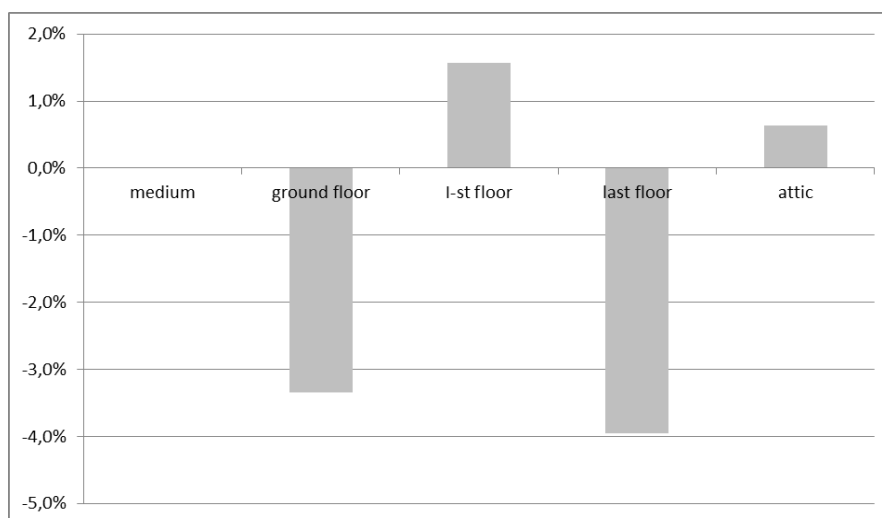


Figure 6. Percentage differences in the value of dwellings including the penthaus effect

Source: Own study based on the conducted survey

There is also an inverse relationship. Apart from flats on the top floor, transcriptions of attics adapted for residential purposes were recorded. Then the price dependence on the floor shows the opposite tenancy than in the case of penthouses.

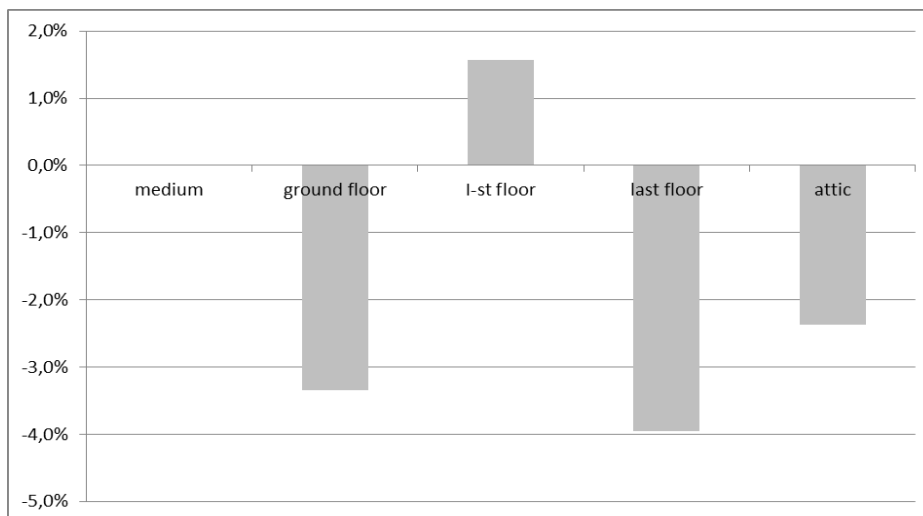


Figure 7. Percentage differences in the value of flats, including flats adapted to the attic

Source: Own study based on the conducted survey

To sum up, the location of an apartment on the floor influences the unit price of the apartment within the limit of 10 %. The most valuable flats are those on the first floor, whose average unit price is about 1.5% higher than those on intermediate floors. On the other hand, the lowest prices are quoted for flats on the ground floor (lower by more than 3%) and flats on the last floor (lower by almost 4%).

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DETERMINANTY WARTOŚCI ŚLĄSKICH LOKALI MIESZKALNYCH NA PRZYKŁADZIE ZMIENNOŚCI ZALEŻNEJ OD KONDYGNACJI

Streszczenie: W artykule rozważono determinanty wartości mieszkań na Śląsku w aspektach uzależnionych od zmienności kondygnacji. Polskie prawo definiuje trzy różne rodzaje własności mieszkań. Oprócz atrybutu rynkowego dotyczącego rodzaju kondygnacji, istnieje wiele różnych atrybutów wartości. Dla potrzeb oznaczenia stosunkowo niskiego poziomu wpływu kondygnacji, oscylującego w granicach kilku procent należało ustalić rodzaj prawa własności i trend czasowy. Artykuł ma na celu ocenę, które kondygnacje są zależne od wartości i wskazanie wpływu na różnice cenowe. Wyniki badań oparte są na zbiorze danych zebranych z ponad 14 000 sprzedaży występujących na regionalnym rynku Śląskim od sierpnia 2017 roku do sierpnia 2018 roku. Znajomość praw i specyfiki rynku nieruchomości jest podstawą do podejmowania różnych decyzji związanych z zarządzaniem i obrotem nieruchomościami. Wartości procentowe pozwalają m.in. na obliczenie różnicy w cenie pomiędzy lokalami na parterze, pierwszym/ostatnim piętrze i mieszkaniami adaptowanymi na poddaszu.

Słowa kluczowe: lokale mieszkalne, wartość rynkowa, szacowanie wartości nieruchomości, zmienność wartości zależna od kondygnacji

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