

CZECH UNIVERSITY OF LIFE SCIENCES

Faculty of Economics and Management

Department of Economics



Bachelor Thesis

Economic Analysis of real estate of Prague-West district

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Karolína Zemanová

Economics and Management

Thesis title

Economic Analysis of Real Estate of Prague-West district

Objectives of thesis

The aim of this bachelor thesis is to evaluate the real estate market in the Prague-West district, identify the characteristics of the real estate market, to assess economic factors that have an influence on the prices in the real estate market and to compare the real estate prices between different districts. My plan is to find the necessary information in books and on the internet, and after I would like to contact real estate companies and have them confirm if my data corresponds with the current market.

Methodology

The theoretical part is based on data collected from specialized publications and other written or online sources such as real estate company srealty.cz, Czech Statistical Office and so on using regression method (trend function) and index analysis (Fixed base index and Chain base index).

The practical part consists of economic-mathematic methods, statistical methods and regression used for evaluating real estate market of Prague-West district.

The proposed extent of the thesis

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Keywords

real estate, Prague-West district, market, prices, residential, analysis

Recommended information sources

BRADÁČ, Albert. Metodiky oceňování nemovitostí pro účely úvěrového řízení: vč. úvěrů hypotečních v České spořitelně, a.s. Brno: Akademické nakladatelství CERM, 1995.

KOLBE, Phillip T., Gaylon E. GREER a Henry G. RUDNER. Real estate finance. Chicago: Dearborn Real Estate Education, c2003. ISBN isbn0793165938.

LARSEN, James E. Real estate principles and practices. Hoboken, N.J.: Wiley, c2003. ISBN isbn0471223794.

MCLEAN, Andrew James a Gary W. ELDRED. Investing in real estate. 4th ed. Hoboken, N.J.: Wiley, c2003. ISBN isbn047132339x.

SCHNEIDEROVÁ HERALOVÁ, Renáta. Oceňování nemovitostí. Praha: České vysoké učení technické, 2008. ISBN isbn978-80-01-04032-4.

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Declaration

I declare that I have worked on my bachelor thesis titled “Economic Analysis of real estate of Prague - West district” by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any third person.

In Prague 15th of March 2019

.....

Karolína Zemanová

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I would like to express my gratitude to my supervisor, Ing. Petr Procházka, MSc, Ph.D., for his valuable comments, supervision and assistance during the assessment of my bachelor thesis.

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Economic Analysis of real estate of Prague-West district

Abstract

This bachelor thesis aims to analyze the actual situation of the real estate market with apartments in the district Prague - West and using a regression analysis to determine what factors and how they affect real estate price the most.

The thesis is divided into two main parts. The first part is theoretical and contains general characteristics of the market: basic terms, basic characteristics of the property market, factors and principles affecting the price of real estate.

The second part is practical and deals with the analysis of real estate market in the Prague - West region and identification of factors that determine the current situation and prospects of further development. The final part of the thesis is a summary of the results of real estate prices and an estimate of the development of the market in the future years.

Keywords

Real estate, real estate evaluation, real estate market, price, price determinants, market value, Prague – West district, regression analysis

Ekonomická analýza realitního trhu v oblasti Praha - západ

Souhrn

Tato bakalářská práce má za cíl zanalyzovat aktuální situaci realitního trhu s byty v okrese Praha – západ a pomocí regresní analýzy určit, které faktory a jak ovlivňují nejvíce cenu nemovitostí.

Práce je rozdělena na dvě hlavní části. První část je teoretická a obsahuje obecnou charakteristiku trhu: základní pojmy, základní charakteristiky trhu nemovitostí, faktory a principy ovlivňující cenu nemovitostí.

Druhá část je praktická a zabývá se analýzou trhu nemovitostí v oblasti Praha – západ a identifikací faktorů, které určují aktuální stav a perspektivy dalšího vývoje. V závěru práce je shrnutí výsledků cen nemovitostí a odhad vývoje trhu v budoucích letech.

Klíčová slova

Nemovitost, oceňování nemovitosti, realitní trh, cena, horotvorné faktory, tržní hodnota, Praha – západ, regresní analýza

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List of abbreviations

Aptapartment

CZSO.....Czech Statistical Office

CZKCzech crowns

Panpanel

Pers.....personal

HAhousing association

1. INTRODUCTION

The real estate market plays a big and important role not just in an economy of a state but also in everyone's life. Real estate plays a big role in our life, it could be for buying, renting, inheriting or selling of it. For many people buying a house or an apartment is the biggest investment they will ever make during their life.

After the Velvet Revolution in the year 1989 the real estate market has started to also be accessible for foreigners. Czech Republic has become an attractive place for investments into business and also for investments into the real estate.

After many economic ups and downs, in which some people have lost their account savings and their money got depreciated and devaluated, in the Czech Republic the investments into the real estate has become popular and the most secure investment. This has led the real estate prices to increase.

Mostly after the economic crisis in the year 2008 and its impact on the following years, the boom of buying real estate has begun. People started to buy real estate for themselves to live in and also real estate for renting.

Over the past ten years Airbnb has become a big player on the real estate market. Airbnb is a web service that mediates rental accommodation anywhere in the world. According to an article on idnes.cz: *„Airbnb is a web platform that connects private owners of free real estate (homes, flats and rooms) with tourists and other travelers looking for a night's lodging. In 2017 more than a million tourists in more than 10,500 dwellings were housed in the Czech Republic via Airbnb.”*

The price of real estate is influenced by many factors such as position, type of the real estate, age, traffic, public transport, accessibility, etc. Also one of the most important factors, which play a big role, is the decrease of interest for mortgages. Its availability and whether they are financially attractive.

Nowadays it is quite common for the families with kids to buy a house outside Prague or buy an old house or an apartment outside of Prague and renovate it. The Prague-West

district is becoming more and more popular not just for families seeking for a house or apartment but also for construction companies.

That is because of the rising prices for properties in the capital city. People are still working in the city and having a generally higher salary while living outside the expensive capital. People like to have work, culture and city life close but also live in a quiet place closer to the nature where they can relax. Transportation from and to Prague is greatly organized with many busses driving up and down many times a day.

2. THESIS OBJECTIVES AND METHODOLOGY

2.1. OBJECTIVES

The aim of this bachelor thesis is to analyze and evaluate the factors influencing the real estate market in the Czech Republic with focus on the Prague – West district. And to analyze the current situation on the real estate market with apartments and their future prospects.

The main goal in the practical part is to evaluate the current price situation with apartments in the Prague – West district calculated with regression analysis. And determine which factors are influence the final price of the real estate the most. Working hypotheses will be defined and tested and based on the results conclusions will be drawn.

Goals:

- Identification of the main factors influencing the prices of apartments
- Evaluation of price development with help of regression analysis
- Evaluation of figures and tables
- Evaluation of results

2.2. METHODOLOGY

This bachelor thesis will contain a theoretical part and a practical part. The theoretical will provide the essential knowledge of the topic. The information was obtained from various sources (specialized literature, internet articles and videos).

The collected data used for practical part was collected from the internet website Sreality.cz, which is the biggest real estate server database that collects real estate offers from the Czech real estate market directly from the real estate offices or real estate owners.

In the analytical part the data needed to estimate the parameters of the economic and statistical model is collected from the web server SReality.cz. The data is used for regression analysis and numerical analysis of data to create several charts.

Based on the calculated results from the analytical part, the conclusion will be formulated.

3. LITERATURE REVIEW

3.1. BASIC DEFINITIONS

In real estate there are many definitions that are necessary to understand.

According to Act No. 89/2012 Coll., The Civil Code, movable and immovable things are defined as: *"All the things around us are divided into a movable and immovable category. Movable things can be moved from place to place and immovable things are not movable. Into immovable things belong estates, lands and buildings."*

A Civil Code from the year 1964 defined real estate property as building and estate that has been built on as two separated properties. In the year 2014 new Civil Code has come into force and has adjusted the real estate property interpretation as the estate and the building it has been built on it as one property. At the same time, the term of real estate extended to material rights to tangible immovable property.

The Czech Civil Code describes immovable property: *"As land and underground constructions with separate purpose, as well as the material rights to them, and the rights, which are declared by the law for immovable property. If the law stipulates that a certain object is not part of the land it is on, and if such an object cannot be transferred from one place to another without infringing its essence, this property is also immovable. All other things, whether tangible or intangible, are movable."*

According to the current legislation, land and buildings built on the property are considered to be immovable properties, which are connected with the land by a solid foundation. Including natural objects such as permanent vegetation, water areas and other natural objects. All together within a parcel of land or multiple parcels of land are called a set of properties. In addition to the main building, there may also be a number of secondary structures that make up main building accessories. This can be described either descriptive or as a registration number that the main building is registered under (Schneiderová Heralová, 2008).

As the Czech Building law describes: *"Building is understood to mean all construction work that is produced by construction or assembly technology, regardless of their construction, construction products, materials and structures, for use and duration. A temporary building is a building in which the building office will pre-limit the duration of its intended duration. A construction product is also considered to be a building. The building that serves advertising purposes is a building for advertising."*

The Land Register

The Land Register is a public list that contains a set of data on immovable property, including their inventory, descriptions, their geometric and location designations and the registration of rights to these properties. The Land Register is a source of information that serves to protect the rights to immovable property for the purposes of taxes, fees and other similar monetary payments, to protect the environment, to protect the mineral resources, to protect the interests of the state monument care, to develop the territory, to real estate valuation, for scientific, economic and statistical purposes (Act on Land Registry - Cadastral Act).

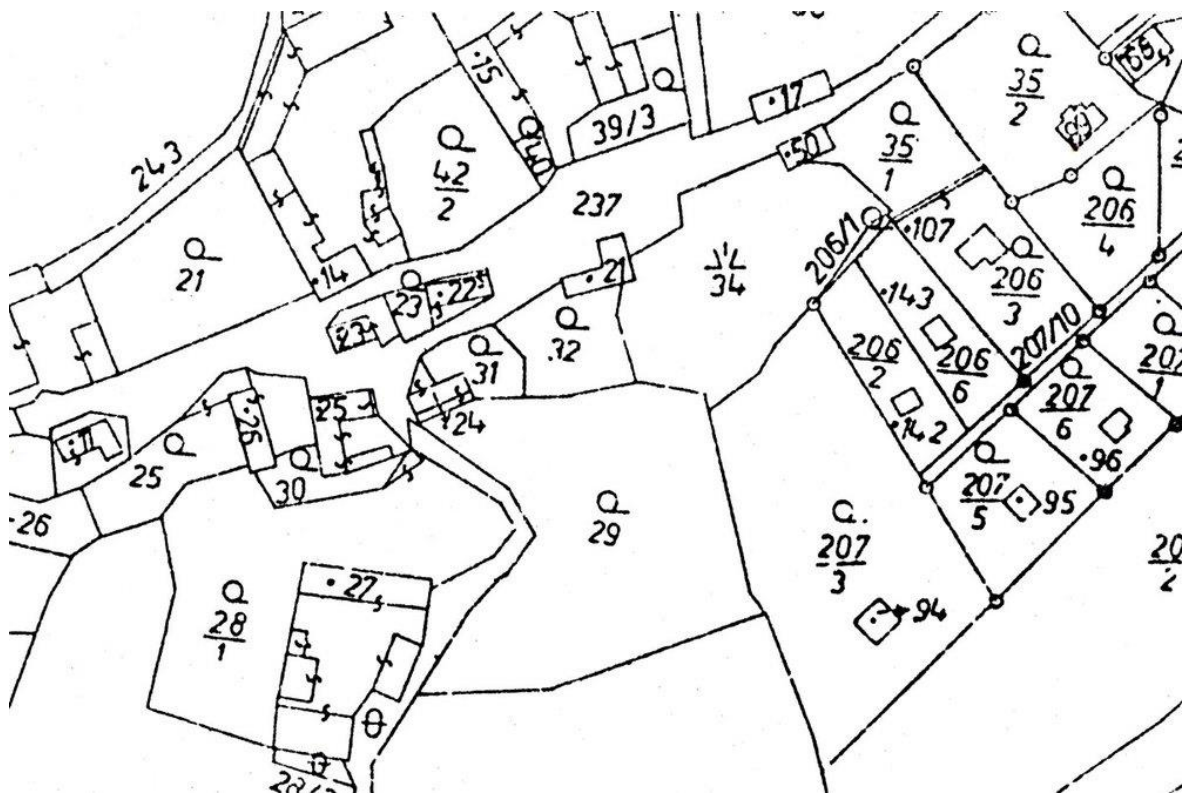
The functions of the Cadastral office according to the law Act No. 256/2013 Coll. The Land Registry Act (Cadastral Act) are following:

Cadastral offices

- a) perform the state administration of the Land Register of the Czech Republic,
- b) perform densification of points management and detailed fields of position and height,
- c) deal with breach of order in the Land Register of the Czech Republic pursuant to a special law,
- d) approve changes of nomenclature and provide activities related to the standardization of geographical nomenclature,

- e) approve changes in the boundaries of cadastral territories,
- f) perform the administration of the basic state map papers set by the Land Register,
- g) perform other tasks in the field of a land surveying and cadaster of real estates of the Czech Republic, which are assigned by the Land Register.

Figure 1: Cadastral map



Source: www.reflex.cz

The estate

The Act No. 256/2013 states that: *"The estate is a part of the terrestrial surface separated from the adjacent parts by the boundary of the territorial unit or the boundary of the cadastral territory, the ownership boundary, the boundary established by the regulatory plan, the territorial decision, the collective permit for the construction and the permit, the public contract replacing the territorial decision, the territorial consent or the boundary given by the approved intention of the building authority, the boundary of another right according to § 19, the boundary of the extent of the lien, the boundary of the scope of the*

right of construction, the boundary of the types of land, or the interface of the way of land use. "

Pursuant to Act No. 151/1997 Coll., Section 9 for the purposes of valuation land is divided into:

a) building site - registered in the Land register as an unbuilt land, in each type of land, which was issued by territorial decision to be build up

- registered in the land register as built-up land, in particular land types, forming a single functional unit with building and land

- the areas of land actually built by the constructions, regardless of the recorded state in the Cadastral Office

b) agricultural land - recorded as arable land, hop fields, vineyards, fruit trees orchard, garden, meadow and pasture

c) forest land - forest land and wooded non-forest land recorded in the Cadastral Office

d) land registered in the Cadastral Office as a water surface

e) other lands - economically unusable lands and barren lands such as gorge, limestone, barrier, swamp and morass.

Building parcel

Building parcel is a parcel that is geometrically and locally designated, displayed in the Land Register map and marked with a parcel number. The building parcel is a parcel of land and a courtyard. A parcel of land is a land parcel that is not a building parcel. The whole land parcel can also consist of several parcels (Act on Land Registry - Cadastral Act).

Building

As a building is understood all construction works that are produced by construction or assembly technology, regardless of their construction execution, construction products, materials and structures, for use and duration. A temporary building is a building in which the Building Authority will pre-limit its duration. Also construction product is also considered to be a building. And the building that serves advertising purposes is a building for advertising (Building Law).

Pursuant to Act No. 151/1997 Coll., § 3 (Law on valuation of property), the buildings are divided into:

a) land-based buildings

- buildings which are spatially concentrated and outwardly predominantly enclosed by perimeter walls and roof construction, with one or more enclosed spaces of use,
- units,
- outdoor treatments,

b) engineering and special ground buildings such as buildings for transport, water, power and water distribution, sewerage, towers, masts, chimneys, areas and landscaping, water wells and other structures of a special character,

(c) water tanks and ponds,

d) other constructions.

Classification of buildings by type is determined by a regulation. For the purposes of valuation, the assessment shall be carried out according to the purpose of use. In case of inconsistency between the purpose of the use of the building written in the final inspection permit or in a final inspection permission or in a building permit or in a public contract replacing the building permit or in a notice or announcement by the builder to the Building Authority or in agreement with the Building Authority or in an authorized inspector's certificate and actual use, it is based on valuation of the actual use of the building.

If there are no documents on the purpose for which the building was authorized or in the case of a discrepancy between the officially listed building in the Land Register and the actual being, it is valid that the building is intended for the purpose for which it is equipped with a construction and technical arrangement. In case the equipment is provided with several purposes, it is assumed that the structure is intended for the purpose for which it is used without defects. (Property Valuation Act)

Depending on the purpose of use, we divide the buildings into:

- apartment buildings,
- family houses,
- school buildings and educational buildings,
- administrative buildings,
- social care buildings,
- facilities for culture, sports and recreation,
- buildings for production and services,
- traffic structures, paved areas, garages,
- pipe lines, Wastewater Treatment Plant (WWTP), water reservoirs.

3. 2. VALUE AND THE PRICE OF REAL ESTATE

The real estate price depends on factors like the location where the house or apartment is located, whether it is new or old, or in good condition or it may need a total renovation. So since the state of the real estate is constantly changing, the prices of houses, apartments and land are also constantly changing.

Prices and values used in real estate valuation are of different kinds. The price represents the required, offered or paid amount for the goods or service. Value represents the monetary relationship between goods or services that can be purchased. The value should be as accurate as possible to the benefit of the owner of the goods or services offered at the moment the value is determined. Valuation is typically done by an estimate and the individual types of values - material, market, middle, etc. (Bradáč, 1995).

In practice the price is determined by comparing already realized sales of the similar real estate in a given location and time.

According to Bradáč (1995), the price according to the price regulation is the administrative price, which is used mainly for tax purposes and is determined by a number of simplifications and averages through the legal norm, the property valuation act and also the implementing decrees. There is another kind of price, is the purchase price at which it was possible to buy the item before wearing it out at the time of its purchase, and we most often encounter this type of price in the accounting records. And the reproduction price is then the price at which the same or, comparable, real estate can be purchased at the time of valuation, also without deduction of wear it out.

Bradáč, in his newer book *Teorie oceňování nemovitostí (2004)* writes that: *"the value is not actually paid, requested or offered. It is an economic category. On one hand, it expresses the relationship between goods and services that can be bought, on the other hand, between buyers and sellers. It is, therefore, an estimate of benefit, the benefit of the owner of the goods or services at the date on which the estimation of the value is made. There are many types of values according to the definition method (e.g. material value, profit value, mean value, market value, etc.), each of which can be expressed in a different*

number. For valuation, it is therefore always necessary to clearly define what value is detected."

The property price is determined by the interaction of demand and supply. Because the economic utility of the parcel expresses a positional rent, it will affect the location and price of parcel or the property itself. In a built-up area is the location very significant factor in the price that the physical characteristics of the area may be subordinate and, in particular, in the city centers completely receding into the background (Meier, 2000).

Property Valuation Act (Act No. 151/1997 Coll.) defines the methods of evaluating property and services as follows:

- 1) Property and services are valued at the usual price, unless this Act provides another valuation method. According to this Act, the usual price is the price that would be obtained when selling the same or similar property or providing the same or similar service in the ordinary trade relations in the country on the valuation date. All circumstances that affect the final price are considered, however, the impact of extraordinary market circumstances, the personal circumstances of the seller or buyer or the influence of special popularity are not counted. Exceptional market circumstances include the state of the seller or buyer's distress, the consequences of natural or other calamities. Personal circumstances include, in particular, property, family or other personal relationships between the seller and the buyer. Special interest is the special value attributed to property or service resulting from a personal relationship to them. The usual price expresses the value of the object and is determined by comparison.
- 2) Extraordinary price means the price, the amount of which was reflected in exceptional circumstances of the market, the personal circumstances of the seller or buyer, or the influence of special popularity.
- 3) The price determined pursuant to this Act, other than the usual price or extra price, is the price determined.
- 4) The service is the provision of activities or materially identifiable results of activities.
- 5) Another valuation method provided by this Act.

The market value represents the price at which it would be possible to sell the same or similar property on the valuation date, without reflecting personal circumstances, relationships, or the consequences of natural or other unexpected calamities. The market price is set at the moment of realization of a particular sale and is not accurately determined. Market value is only a theoretical suggestion or opinion and the market price is already attained at a particular moment under the specific conditions. (Ort, 2008)

3.3. FACTORS INFLUENCING THE PRICE

As mentioned earlier there are many factors that influence the prices of the real estate market.

The most significant factors that influence the price are:

1) **political – administrative influences**, which are mainly local plans, building regulations, tax policy, the environment, security, protection and public interests.

2) **economic influences**, including employment in the given area, purchasing power, living standard, financing possibilities of the real estate, economic development, as well as the overall situation in the construction industry, technology, inflation, interest rate at a given period and many more.

3) **socio-demographic factors**, such as population development, family size, education of the population, housing standard in the area, average lifestyle, country's social policy, etc.

4) **and the physical impacts** of the location of the property, its size, method of construction, topography, architecture, equipment, usability, age of buildings, maintenance status, technical life, economic, moral life, transport, investment and also neighbors and others (Zazvonil, 1996).

In order to be able to predict the development of housing prices, we must be able to identify the factors that influence the development of price.

According to Petr Podlešák, manager of the real estate agency RE/MAX Alfa, these factors we can divide into predictable and unpredictable categories:

Predictable factors:

a) GDP

The real estate market is influenced by GDP (Gross domestic product) growth. If GDP grows, people make more money, and this is also reflected in the growth in the demand for

real estate. Demand growth then puts pressure on price growth. If, on the contrary, GDP is declining, people earn less, which reduces the demand for real estate.

b) Interest rates

Mortgage interest plays a crucial role in the real estate market. If interest rates are low, people are encouraged to negotiate mortgages and demand for real estate is growing. By lowering interest rates, the Central National Bank (CNB) seeks to support investment activities. On the contrary, if the CNB's interest rates rise, it seeks to dampen the investment activity and thus protect the economy from overheating.

c) Migration

Migration within the regions of the Czech Republic plays a major role in the real estate market. People move to Prague or its neighborhood, because Prague is a very attractive metropolis with many opportunities (employment, study opportunities, lots of entertainment). Migration will push for rising demand on property which leads to higher prices. The continued interest in rental housing will continue to encourage investors to buy investment apartments.

d) Tourism

Prague is an attractive tourist destination. Short-term rental of apartments via, for example, Booking.com or Airbnb.com, is more attractive for many owners than renting flats for long-term rentals. The demand for suitable rental flats has increased in recent years, which has also pushed up the sales prices of suitable apartments.

e) Inflation, quantitative easing and intervention by the Czech National Bank (CNB)

Central banks across Europe have been striving to revive an economy by quantitative easing or raising money supply. In short, it is nothing more than printing money and putting it into circulation, in an effort to boost investment activity and thus economic growth. And this has again caused pressure in the recent years on rising prices.

f) Housing construction

As demand for real estate grows and its supply stagnates, prices are rising. Insufficient construction in recent years has also put great pressure on real estate prices.

Unpredictable factors:

a) Media, Psychology, Expectations and Mood in the market

The human factor is unpredictable. Media message coupled with the rebounding crisis has discouraged people from buying. On the contrary, at a time when real estate prices are breaking records, people are still buying. People are easily influenced by mass psychosis and the media. The media can make a significant impact on developments on the real estate market and it can affect prices in an unexpected way.

b) Foreign economic development

The Czech Republic's export-oriented economy and the world economy are so interconnected that negative economic developments abroad will also fall into the Czech Republic and its real estate market.

c) Political development

War conflicts, mistaken political decisions by domestic or foreign politicians can also influence the Czech real estate market.

3. 4. PRINCIPLES OF REAL ESTATE

In order to have better understanding of how the real estate market functions and the influences on this market it is necessary to know the principles of real estate that play a role on the establishment of the price.

According to the Odhad online website the real estate market affects three basic principles:

Supply and demand

The real estate market is driven by demand and supply. This rule is absolutely valid without any exceptions. Real estate prices, buyer's and seller's requirements, and the speed of the real estate sales are driven by demand and supply of the property market.

A concrete example is the situation on our Czech real estate market between 2006 and 2008. In these years there was a huge demand of buyers to buy real estate and a very limited offer from sellers. This caused big price rises because the sellers got a lot of offers for their real estate and logically they chose the highest ones or chose a little lower, but the deal was quickly closed. At the beginning of 2009, interest in the purchase of real estate has faded away, as well as their price, because, due to the ongoing economic crisis, the banks has tighten up the conditions for providing mortgages, and buyers could no longer simply lend for the purchase of real estate. Buyer's demand decreased, which worked as one of the main causes of falling real estate prices.

Cause and consequence

The real estate market is governed by the law of causes and consequences. Positive situations result in a positive effect and negative situations result in negative effect. Strong economic growth results in massive market growth and property prices, while massive job losses and a weakened economy generally have the opposite effect. In better times people are spending their money and in worse times people tend to save them. The principle of monitoring demand by offering and, in particular, creating demand based demand is called market allocation.

Cycle and correction

History repeats and there are cycles on every real estate market on the ground. The rise in prices is followed by stagnation and sometimes with decline. There may also be significant price corrections, the so-called bubble burst, if real estate prices grew significantly above the economy's potential, or new unpredictable, high-impact factors appeared.

3. 6. CHARACTERISTICS OF THE PRAGUE-WEST DISTRICT

The territory of the district is a half-moon that surrounds the capital city of Prague from the west. It is in the northeast and southeast adjacent to the Prague-East district, to the south with Příbramsko and Benešovsko, to the west with Berounsko and Kladensko and to the north with the district of Mělník.

With its area of 580 km², the district is the smallest district in the Central Bohemia Region, occupying only 5,3% of its area. The population is 140 200 and the population density is 241,6 inhabitants per km².

Since 1 January 2003, there is one administrative district of the municipality with extended competence (Černošice) and another 6 administrative districts of municipalities with an authorized municipal office (Černošice, Roztoky, Hostivice, Mníšek pod Brdy, Jílové u Prahy, Jesenice).

At present, 79 municipalities belong to the Prague-West District. Of the total number of municipalities, 10 have been granted the status of a city (Jesenice - 9 thousand inhabitants, Roztoky, Hostivice, Černošice, Mníšek pod Brdy, Rudná, Jílové u Prahy, Dobřichovice, Řevnice, Libčice nad Vltavou) and 2 have been granted small town (Štěchovice, Davle).

Prague-West and Prague-East are closing in their center the capital city of Prague, an international metropolis, and forms together with Prague the Prague Central Bohemian agglomeration and serves Prague as its background. They are a source of labor for the capital city, complementing Prague's industry, construction and services, supplying Prague with food and providing Prague its recreational potential. On the contrary, in the territory of both districts there is a massive construction of houses (primarily family houses) in the

last decade. There is a process of so-called suburbanization. Prague's economically strong population moves to the metropolis base with the aim of improving the quality of living. As a result of this sub-urbanization process, both regions have experienced a significant increase in the number of migrants in recent years.

In 2016, 676 dwellings (13.9% of completed dwellings in the region) were completed in the district and 915 dwellings (16.5% of the district dwellings started) were commenced. Prague-West district, together with the Prague-East district, is the area with the highest intensity of housing construction. (Czech Statistical Office)

Figure 2: Map of Prague – West district



Source: www.wikipedia.cz

4. ANALYTICAL PART

Over the past years the development of almost all property segments has been positive. In general strong growth throughout the whole Czech Republic is in Prague and its agglomeration - due to its specificity – higher, overall price has increased around 10 – 30%, depending mainly on the type of property and location. The reasons for the positive development have been caused mainly in the relatively good economic situation in the Czech Republic and foreign countries over the past years. Record low interest rates on mortgage loans in year 2016 allowed weaker income population groups to reach more expensive properties. Growth in 2016 was also affected by the change of law in tax payments, as from November 1st tax on the acquisition of property is paid by the buyer and not the seller anymore. Because of this reason, many buyers wanted to buy property before that day and save paying extra 4% on taxes of the property, which caused even higher demand for real estate.

In assessing the long-term development, it can be stated that after the global economic crisis in year 2008 real estate prices in the Czech Republic began to decline in each following year. This decrease hit the bottom in 2013 and from this period to the present day it has steadily grow.

For the analytical part 80 apartments were analyzed that were being offered for sale in the Prague – West district. These apartments were randomly selected from the real estate database of the Czech website SReality.cz. Each apartment has 11 characteristics also called variables, which are influencing the real estate value. Dependent variable is the price per m² of the real estate and this variable is affected by other variables, called independent variables.

4.1. REGRESSION ANALYSIS

Regression analysis is a statistical method that is used to examine the relationship between two or more variables of our interest. Regression analysis methods are used in situations where we are interested in the dependence of a certain quantitative (continuous) variable on one or more other quantitative (contiguous) variables. In advance, what is the variable is independent (explaining) and which is dependent (explained, also called a response). The purpose of regression analysis is to describe this dependency using a suitable (mathematical) model. Depending on the number of independent variables, we distinguish models of simple regression and multiple regressions. Simple regression describes the dependency of the explained variable on one regressor. Instead, multiple regression addresses the situation where dependent variable depends on more than one regression. Depending on the type of regression function, the linear models a can also be distinguished nonlinear. In this thesis will be used linear models (i.e. situations where regression functions are linear in parameters). For example, $Y = b_0 + b_1X_1 + b_2X_2 + \dots$, where Y is dependent and X_i are regressors. There are also tasks where the dependent variable is any categorical variable with a certain number of variations, similarly registers need not be just continuous variables.

Kubanová (2004) in her book writes that value dependency of one variable on the values of the other variable is expressed by a functional relationship $y = f(x)$. In this case we can exactly determine which values will have the y variable from the knowledge of the specific values of x . Such dependence is called a functional one. The monitored variable is usually not affected only by one random variable X , but usually by more variables. Often we cannot even identify them and describe their exact relationship to the tracked variable. In a case like this it is not a functional dependence between variables X and Y , but nevertheless we still speak about dependent variables. We speak about the stochastic dependence. Using the regression function we can predict which values will gain one random variable if we know the value of the second random variable. Because Y is a random variable, x of a random variable X doesn't have to always gain the value of $E(Y | x)$ (the value of $E(Y | x)$ the random variable gains "in average" there), but it will gain values diffused around it. The purpose of this method is to find out which of the value creating factors of the real estate has the greatest influence on the final price. There are created hypotheses and after the testing of hypotheses by the p -value with 0,025 level of significance.

4.1.1. ECONOMIC MODEL

The price of the real estate, in this case apartment is affected by many factors. These factors are: area of the apartment, type and condition of the building, type of ownership, floor number, if it has balcony or not, if it has elevator or not, building energy demand and location. All these factors and many more affect the price of the real estate. But for the regression analysis has been chosen the named above.

4.1.2. VARIABLES

A variable is something that needs to be measured. It is an attribute that describes a person, place, thing, or an idea. The value of the variable can vary from one entity to another.

There are two types of variables: quantitative and qualitative. Quantitative variable is also known as continuous variable. This variables use numbers. On the other hand qualitative or categorical variables are variables that use words.

At first it is important to determine dependent and independent variables. Independent variable is also known as experimental or predictor variable. It is a variable that is the cause or reason of any situation which can be manipulated. Dependent variable is something that depends on other factors. It is also known as outcome variable.

Dependent variable (Y):

Price per m² (in CZK) – price of the real estate (apartment) per m² in the Czech crowns.....**Y_t**

Independent variables (X):

Area of the apartment (in m²) – size of the flooring area of the apartment in square meters.....**X_{1t}**

Type of the building – the building materials used for construction. Brick house is marked by 0, panel block house is marked by 1..... **X_{2t}**

Type of the ownership – the kind of ownership the property has. Personal ownership is marked by 0, housing association is marked by 1..... **X3t**

Condition of the building– properties newer than five years old are marked by 0, and properties older than five years are marked by 1..... **X4t**

Floor number – the level of floor the apartment is on. First floor is marked by 1, second floor is marked by 2, third floor is marked by 3 and fourth floor is marked by 4 etc..... **X5t**

Balcony – presence or absence of the balcony as a part of the apartment, 0 for the presence of balcony and the absence of a balcony is marked by 1..... **X6t**

Elevator – presence or absence of the elevator in the building, 0 for the presence of an elevator in the building and 1 in the case of absence of an elevator in the building..... **X7t**

Building energy demand – it is the amount of energy consumption of a building. There are several energy consumption classes. Extremely economical (A) is marked by 1, economical (B) is marked by 2, compliant (C) is marked by 3, unsatisfactory (D) is marked by 4, unprofitable (E) is marked by 5, very uneconomical (F) is marked by 6 and extremely uneconomical (G) is marked by 7..... **X8t**

Distance (in km) – distance in kilometers from the apartment to Prague city center – Wenceslas Square..... **X9t**

4.1.3. REGRESSION MODEL

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$ are unknown coefficients, which are estimates of the least squares method.

The aim of the task is to determine the functional dependence of the price and the remaining variables and to estimate its significance in some way.

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \varepsilon_t$$

ε represents random model error.

4.1.4. HYPOTHESIS

Hypothesis is a claim or idea that we want to test or to investigate. With further testing, the hypothesis is proven true or false. There are two types of hypothesis: null hypothesis and alternative hypothesis.

Null hypothesis is the default hypothesis, denoted by H_0 . It says there is no statistical significance between the two variables. This hypothesis we try to disprove or discredit.

Alternative hypothesis (H_1) is the opposite of the null hypothesis. It states there is a statistically significant relationship between the two variables.

H_0 : Price is not dependent on the area of the apartment

H_1 : Price is dependent on the area of the apartment

Price is directly proportional to the area of the apartment that is **positive economic sign**

H_0 : Price is not dependent on the type of the building

H_1 : Price is dependent on the type of the building

Price is directly proportional to the type of the building that is **positive economic sign**

H_0 : Price is not dependent on the type of the ownership

H_1 : Price is dependent on the type of the ownership

Price is directly proportional to the type of the ownership that is **positive economic sign**

H_0 : Price is not dependent on the condition of the building

H_1 : Price is dependent on the condition of the building

Price is directly proportional to the condition of the building that is **positive economic sign**

H_0 : Price is not dependent on the floor number

H_1 : Price is dependent on the floor number

Price is directly proportional to the floor number that is **positive economic sign**

H_0 : Price is not dependent on the presence of balcony

H1: Price is dependent on the presence of balcony

Price is directly proportional to the presence of balcony that is **positive economic sign**

H0: Price is not dependent on the presence of elevator

H1: Price is dependent on the presence of elevator

Price is directly proportional to the presence of elevator that is **positive economic sign**

H0: Price is not dependent on the building energy demand

H1: Price is dependent on the building energy demand

Price is directly proportional to the building energy demand that is **positive economic sign**

H0: Price is not dependent on the distance

H1: Price is dependent on the distance

Price is not directly proportional to the distance, it is indirectly proportional. The hypothesis is that if the distance from Prague city center is closer (smaller number), price of the real estate rise and opposite, the further away from Prague city center, the more the price decreases. That is **negative economic sign**

The null (H0) and the alternative (H1) hypothesis can be stated as:

H0: $\beta_1 = 0$, H1: $\beta_1 \neq 0$

The estimation is that all the independent variables would affect the price of the apartment in some way. Some variables would have bigger impact and some less or none. Probably some significant impact on real estate price would have distance (location), condition of the real estate and floor area of the apartment.

Table 1: Demonstration of the flats data collected from SReality.cz

ID	Address	Price (in CZK)	Price per m ² (in CZK)	Area (m ²)
Apt n. 65	Ke Kapličce, Dolní Břežany	3 557 000	82 720,93	43
Apt n. 66	V Roháči I., Jesenice	8 900 000	78 761,06	113
Apt n. 67	Bolzanova, Chýně	2 500 000	96 153,85	26
Apt n. 68	Chrástany	4 150 000	74 107,14	56
Apt n. 69	Vlháčkova, Roztoky	4 090 000	71 754,39	57
Apt n. 70	Nezvalova, Vestec	5 500 000	91 666,67	60
Apt n. 71	Boženy Němcové, Velké Přílepy	3 850 000	59 230,77	65
Apt n. 72	Lipová, Holubice	3 499 000	39 761,36	88
Apt n. 73	Palackého, Jílové u Prahy	1 999 999	48 780,46	41

ID	Type of building (brick 0, pan 1)	Ownership (pers 0, HA 1)	New building (yes 0, no 1)	Floor number
Apt n. 65	0	0	1	2
Apt n. 66	0	0	0	2
Apt n. 67	0	0	0	2
Apt n. 68	1	0	1	1
Apt n. 69	0	0	1	1
Apt n. 70	0	0	0	1
Apt n. 71	0	0	1	1
Apt n. 72	1	0	1	3
Apt n. 73	0	0	1	1

ID	Balcony (yes 0, no 1)	Elevator (yes 0, no 1)	Building energy demand (A1, B2, C3, D4, G7)	Location (distance from Prague center in km)
Apt n. 65	0	1	4	12,42
Apt n. 66	0	1	2	13,43
Apt n. 67	0	0	2	15,06
Apt n. 68	0	1	4	7,79
Apt n. 69	0	1	1	9,92
Apt n. 70	0	1	2	12,59
Apt n. 71	0	1	4	12,84
Apt n. 72	0	1	7	15,84
Apt n. 73	1	1	4	21,41

Source: Own data processing

4.1.5. REGRESSION ANALYSIS

Table 2: Apartments in the Prague – West district, regression analysis

Regression Statistics	
Multiple R	0,545667
R Square	0,297753
Adjusted R Square	0,206155
Standard Error	12749,295851
Observations	79

Source: Own data processing

Multiple R is the value of multidimensional coefficient correlation, which is the root of the R^2 value, the so-called coefficient of determination.

An important indicator of the suitability of the model is the **coefficient of determination R^2** , which is sometimes interpreted as the match of the data model. The R^2 value describes how much total variability in the dependent variable we have been able to explain in our model. Here is relatively low: **$R^2 = 0.297753$** . Based on this coefficient, it can be said that the variability of explained variable (price), is explained by **29, 8 %** of the model with variables mentioned above. Almost 30 % is quite bad outcome, it is caused because there are other variables that are not in this model such as equipment, parking opportunity, cellar and so on.

Adjusted R^2 has a similar meaning as coefficient of determination, but also takes into account the number of regressors included in the model. The adjusted coefficient R^2 then serves to compare models that differ by the number of variables. It means that the data that has been used in this model explain the price on **20, 6 %**.

Table 3: Outcome of the regression analysis

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	99729,95	8188,28	12,18	0,00
Area (m2)	-112,83	57,54	-1,96	0,05
Type of building	-4933,57	4233,05	-1,17	0,25
Type of ownership	-21263,06	9768,57	-2,18	0,03
New building	4525,63	4156,80	1,09	0,28
Floor number	-1289,28	1351,73	-0,95	0,34
Balcony	-4494,93	3182,38	-1,41	0,16
Elevator	-7629,16	3795,44	-2,01	0,05
Building energy demand	-1244,11	906,62	-1,37	0,17
Distance from Prague (km)	-1125,00	430,28	-2,61	0,01

Source: Own data processing

The significance of a regression coefficient in a regression model is determined by dividing the estimated coefficient over the standard deviation of this estimate. For statistical significance we expect the absolute value of the t-ratio to be greater than 2 or the P-value to be less than the significance level ($\alpha = 0,01$ or $0,05$ or $0,1$).

When a probability value is below the α level (p - value), the effect is statistically significant and the null hypothesis is rejected. If the null hypothesis is rejected, then the alternative to the null hypothesis (called the alternative hypothesis) is accepted.

4.1.6. STATISTICAL SIGNIFICANCE OF PARAMETERS

Table 4: Statistical significance of parameters, p – value

	<i>P-value</i>	Statistical significance
Intercept	0,00	
Area (m2)	0,05	> 0, 025 - not stat. significant – H0 accept
Type of building	0,25	> 0, 025 - not stat. significant – H0 accept
Type of ownership	0,03	> 0, 025 - not stat. significant – H0 accept
New building	0,28	> 0, 025 - not stat. significant – H0 accept
Floor number	0,34	> 0, 025 - not stat. significant – H0 accept
Balcony	0,16	> 0, 025 - not stat. significant – H0 accept
Elevator	0,05	> 0, 025 - not stat. significant – H0 accept
Building energy demand	0,17	> 0, 025 - not stat. significant – H0 accept
Distance from Prague (km)	0,01	< 0,025 - stat. significant – H0 reject, H1 accept

Source: Own data processing

When p – value of the variable is less than p – value (in this case 0,025), it can be stated that the variable is statistically significant. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted.

The result of regression analysis is that just one variable (**distance**) is statistically significant.

4.1.7. EQUATION

$$Y_t = 99729,95 - 112,83X_{1t} - 4933,57X_{2t} - 21263,06X_{3t} + 4525,63X_{4t} - 1289,28X_{5t} - 4494,93X_{6t} - 7629,16X_{7t} - 1244,11X_{8t} - 1125X_{9t} + \varepsilon_t$$

4.1.8. ECONOMIC VERIFICATION

After determination of statistical significance, it is important to evaluate which of the coefficients are economically significant and how they affect the price.

In the outcome of regression analysis economically significant variable with positive sign was just distance.

β_0 : In the case that all extended variables are 0, the price of the real estate (apartment) per m² would be 99729,95 CZK.

β_9 : The further to Prague city center the apartment is located, the more the real estate price decreases. The decrease is 1125 CZK per m² per 1 kilometer.

4.2. DESCRIPTIVE STATISTICS

Mean, Median and **Mode** are three different properties of data sets that can give us useful and easy to understand information about a data set so that we can see the big picture and understand what the data means.

Mean (or average) equals the sum of values divided by the number of values.

Table 5: Calculation of statistical function - Average

	Average
Price in CZK	4 559 675
Price for m ² in CZK	62 146,6
Floor area in m ²	75,00625
Distance from Prague center in km	14,12925

Source: Own data processing

Based on the data collected from 80 flats in Prague – West district, which were randomly selected from SReality.cz It can be concluded that the average price of an apartment in Prague – West district is currently 4 559 675 CZK. In the above-mentioned district using

the same sample size from the same source we can also say that the Average price per square meter is 62 146,6 CZK.

In this sample size we also see that the average floor area for these flats in Prague – West district is 75,00625 m².

Each flat in the Prague-West district on the sample used has a different distance from Prague city center (Wenceslas square). By calculating each distance separately and then taking the average distance from Prague city center (Wenceslas square) it was found out that the average distance from these 80 flats from their location to the center of Prague is 14 km 129 meter and 25 cm.

4.3. OTHER DESCRIPTIVE STATISTICAL FUNCTIONS

Median is the middle value of the list when the data is arranged in ascending order. To calculate median we first need to arrange the values in ascending order from the least number to the highest number.

Mode is the value that occurs more frequently in our data and is denoted by

Variance (σ^2) represents how spread apart the sample is about the mean. Variance is a measure of deviation, which we are calling variance about the mean in this case. Variance reminds us that this is actually modeling variance of all the data that falls around the mean and how spread apart it is. The bigger the number is the more spread out the data is. The smaller the number is the closer that data is packed around it's mean

We calculate it that for every data point we subtract the mean, we square it and then we do that for every data point and we add them all up.

Standard deviation (σ) is a measure of spread that is how spread out a set of data is. A low standard deviation tells us that the data is closely clustered around the mean or average while a high standard deviation indicates the data is dispersed over a wider range of values. Standard deviation is used when the distribution of data is approximately normal, resembling a bell curve. Standard deviation is commonly used to understand whether a specific data point is standard and expected or unusual and unexpected. Standard deviation

is represented by the lowercase Greek letter sigma: σ . A data points distance from the mean can be measured by the number of standard deviations that it is above or below the mean. A data point that is beyond a certain number of standard deviations from the mean represents an outcome that is significantly above or below the average. This can be used to determine whether a result is statistically significant or part of the expected variation.

The sample standard deviation is equal to the square root of the sample variance and is defined as follows: $\sigma = \sqrt{\sigma^2}$.

Table 6: Calculation of descriptive statistical indicators of price of the real estate

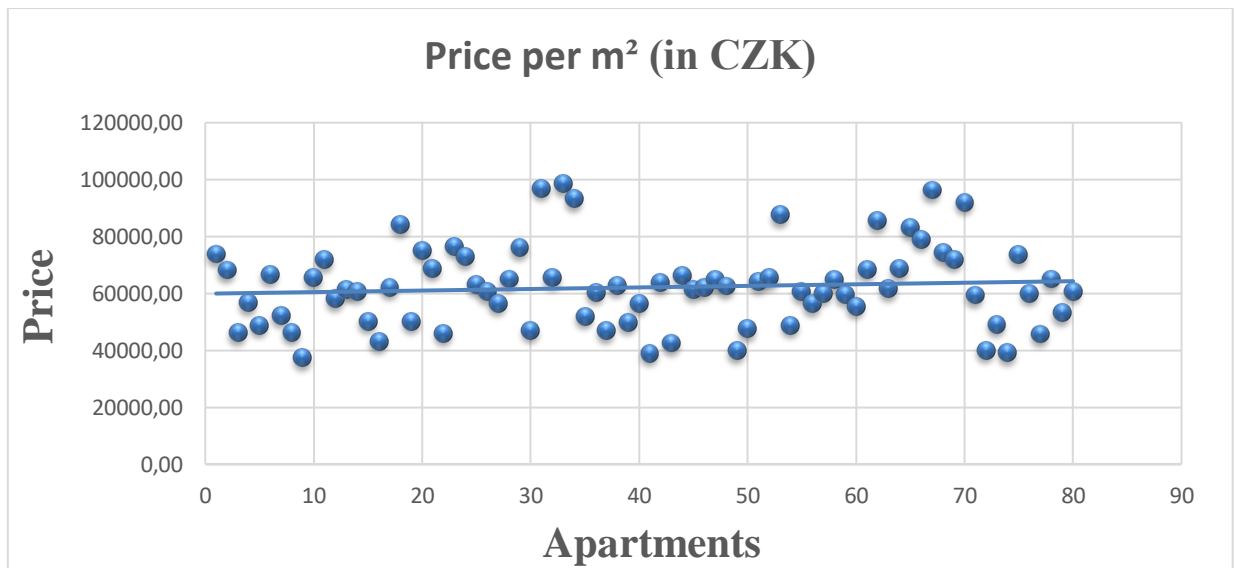
Min price	1 999 999
Max price	11 885 756
Median	4 150 000
Mode	4 150 000
Variance (σ^2)	24 539 582 674 666
Standard deviation (σ)	4 953 744

Source: Own data processing

From the above data sample the minimum price for flat in Prague – West district is 1 999 999 CZK with an area of 41 m² and location in Jílové u Prahy, which is separated by 21,41 km far from the Prague city center. The flat that was the most expensive in the sample data costs 11 885 756 CZK with an area of 128 m² located in Průhonice, which is 12,76 km far away.

4.4. GRAPHS

Figure 3: Price (in CZK) per m² for every apartment in the data set

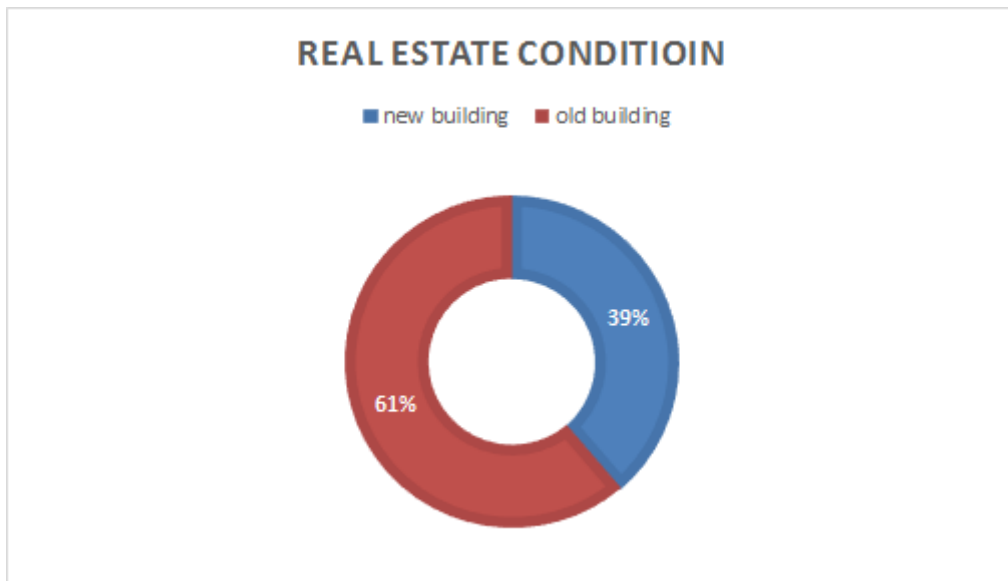


Source: Own data processing

In the above graph each point represents the price of each apartment in CZK. With the highest 98 231,76 CZK per m² and the lowest 37 200 CZK per m².

What is most noticeable is that all the properties fall in between the range of 40 thousand CZK and 70 thousand CZK with as average 60 thousand CZK per property. It is also important to note that with a 95% confidence level, there are no significant outliers in this data set.

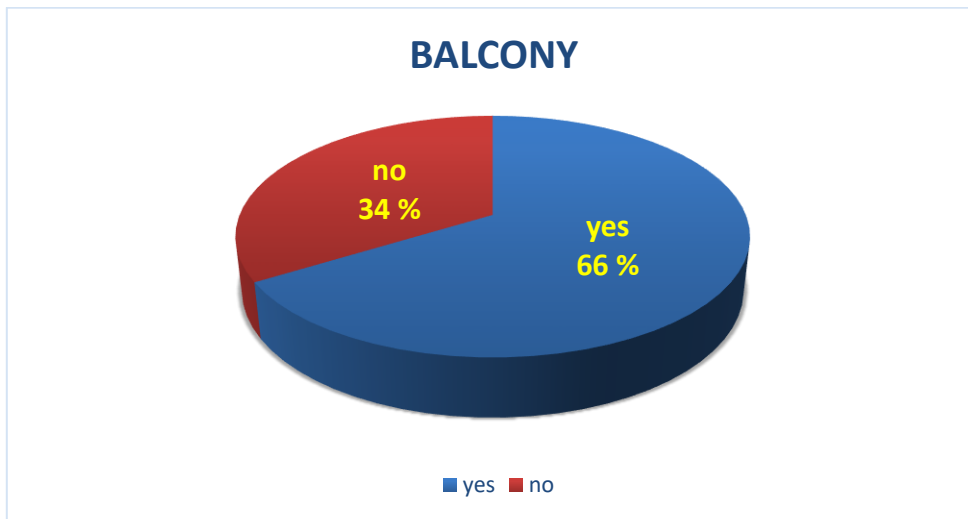
Figure 4: Graph of condition the real estate is in



Source: Own data processing

Data is based on 80 flats in Prague – West district, which were randomly selected from SReality.cz. Considering a building older than five years as old, it becomes important to note that 61% of these flats were located in a building older than five years and that 39% of these flats were in a newly build building. As made clear above, there is a high and growing demand on the housing market, to supply this large demand there was a need to build as many properties as possible. A flat fills the purpose to accommodate more people than in regular housing while also being at a lower cost. This is also the reason why there is this high number of newly build flats available in the Prague and Prague-West district.

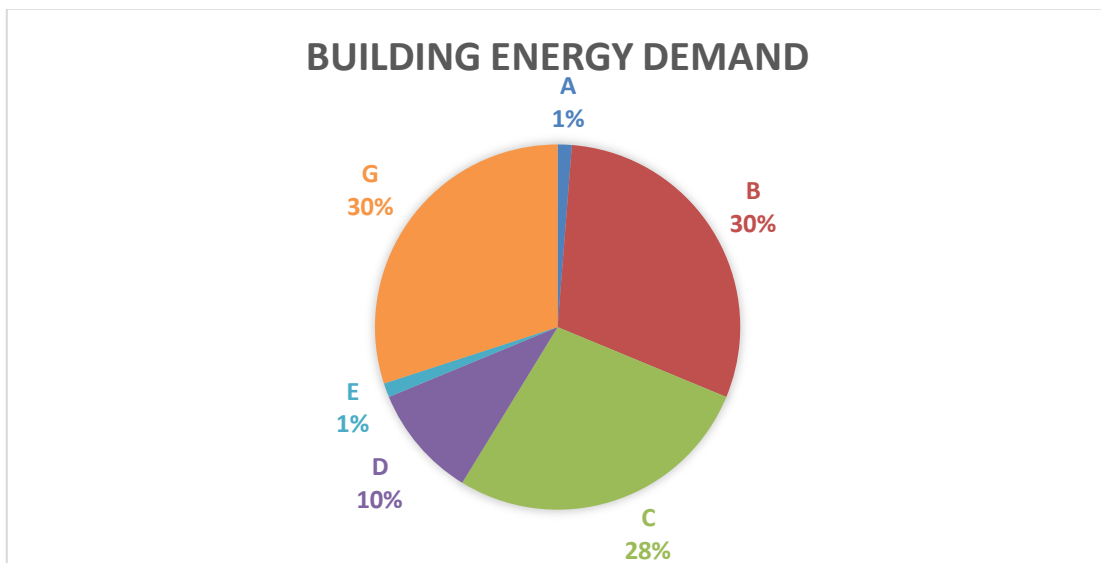
Figure 5: Graph of proportion of apartments with and without balcony



Source: Own data processing

In the same sample size 34% of these flats do not have a balcony whereas 66% of them do have a balcony. In general, a balcony increases the price and living space of the property since it serves as a sort of private garden. This might be the reason why only one third of the flats do not have a balcony.

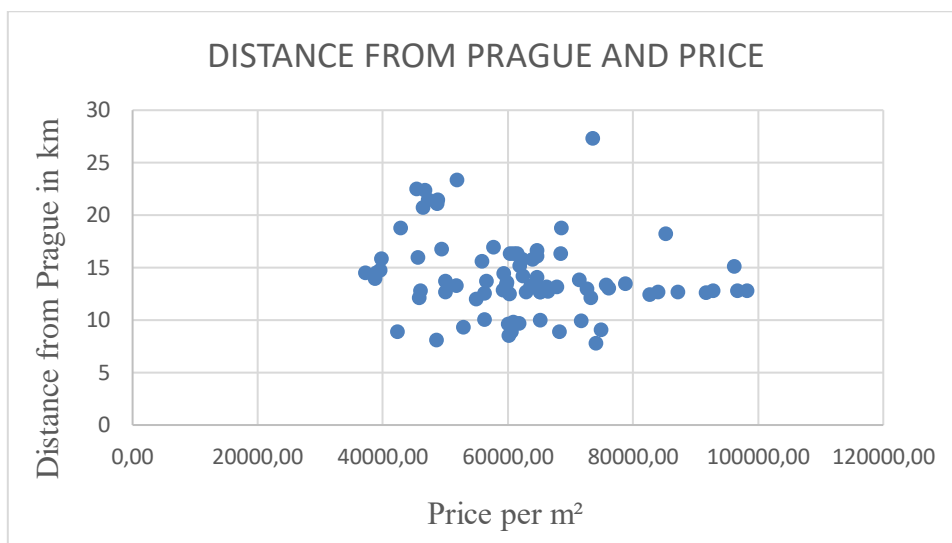
Figure 6: Graph of proportion of building energy demand of apartments



Source: Own data processing

Based on the data from database the most real estates in building energy demand were in category B and G. Category B means that the building is energy economical and category G means extremely uneconomical. Both had 30 % of the data from database, which means 24 real estates. Only one real estate out of all 80 was extremely economical (A) and just one real estate was energy unprofitable (E). Compliant category (C) had 28 % of the cases and category D, which means unsatisfactory energy had 10 % with 8 cases.

Figure 7: Distance from Prague (Wenceslas Square) in km versus the price per m²



Source: Own data processing

Each dot represents the distance in kilometers from one property to the city center of Prague in relation to the price in CZK per square meter. With the sample data it comes to show that the most properties with a 15 kilometer distance from Prague are around 60 000 CZK per square meter.

In general the closer the property is located from Prague the higher the cost per square meter is. In the sample data we can see that there is one outlier with 27,27 kilometer from Prague for 73 534 CZK, in this scenario it could be that other factors play a higher role to the price of this property than only the location.

5. EVALUATION OF RESULTS

From the previous outputs we have obtained a regression equation: $Y_t = 99729,95 - 112,83X_{1t} - 4933,57X_{2t} - 21263,06X_{3t} + 4525,63X_{4t} - 1289,28X_{5t} - 4494,93X_{6t} - 7629,16X_{7t} - 1244,11X_{8t} - 1125X_{9t} + \varepsilon_t$

Standard deviation is a measure of how widely varied the data is, how range of numbers are from the average as from a central point, which is the mean (average). And the bigger the standard deviation, that means the farther apart the points are.

An important indicator of the suitability of the model is the coefficient of determination R^2 , which is sometimes interpreted as a match of model with the data. In this thesis is relatively low: $R^2 = 29,8 \%$. Based on this coefficient, it can be said that the model was explained by almost 30% of a data. This can be explained that there are other factors influencing the price of real estate, such as equipment, floor area, reputation of the location, etc. The adjusted coefficient R^2 then serves to compare models that differ by the number of variables and the model explains the price on **20,6 %**.

In this thesis the statistical significance was calculated using the p – value (0,025 level of significance, so that the results have a 95 % of conspiratorial interval) of the particular variables, which calculated just distance from Prague as statistically significant variable. Overall, it could be said that we have been able to show a certain dependence of price per meter square and distance from Prague. It has been showed that not all the factors stated in this thesis are influencing the real estate price.

The results in this bachelor thesis based on regression analysis show us that the closer the property is located to Prague, the higher the price per m² is. The average price of a flat in Prague – West district is 4 559 675 CZK. The average price per one meter square is 62 146,6 CZK. The average floor area of the flat is 75,00625 meters square. And the average distance from Prague city center (Wenceslas square) is 14, 12925 km.

Minimal price for an apartment in the Prague – West district costs 1 999 999 CZK with an area of 41 m². On the opposite site the most expensive flat costs 11 885 756 CZK with a floor area of 128 m². There are many factors affecting the final price of the real estate. It is important to note that the price may not always correspond to table values. There will

always be unpredictable situations in which, for example, the seller will want to sell quickly at a reduced price, or vice versa, a seller who does not hurry and sell at a higher price. In both cases, this is a non-standard price for the apartment. The occurrence of these specifics will not allow econometric models to have high accuracy estimates.

Of the flats used in the sample, 53 of these properties had a balcony and 27 had no balcony. Resulting in 66 % with the balcony and 34 % without.

Based on these 80 flats used for the sample 61% of them were located in an old building and 39% of which were in a building newer than five years.

The energy consumption of these properties were described with letter A to G with A being extremely energy efficient and G being extremely uneconomical. The result in percentage are 1% for class A, 30% for class B, 28% for class C, 12% for class D, 1% for energy class D and 30% for energy class G.

6. CONCLUSION AND RECOMMENDATION

Using a statistical regression analysis, this bachelor thesis has managed to find a factor that influences the price of the real estate in Prague - West region. This factor is the location of the property, or in other words the distance of the apartment to Prague center. Out of all the variables that were tested in this bachelor thesis, only distance from Prague showed a significant difference.

The conclusion is that the distance from Prague is the only economically and statistically verifiable variable. Specifically if the distance from Prague increases by 1 kilometer, the price per m² will decrease by 1 125 CZK.

In the year 2018 there were many important twists in the Czech Republic real estate market. And even for specialists in the field it is unpredictable to know how the trends will develop in the following years.

Prices of flats are on a high price level. This trend is not just in Prague – West district, but everywhere in the Czech Republic and especially in Prague. We would have to accept that personal ownership of the house or apartment will not be for everyone anymore.

There will be trend to buy old real estate that is falling into disrepair and bring it to life once again. There will be also demand for old village and urban real estate in about an hour's drive to the center of a large city. It is about to describe houses and flats that now fall into the so-called "second chance" realm. New types of houses designed for rent and sale could revive many Czech villages and towns this year and also next few years. For their current owners, who are less likely to use them, new owners would be a welcome change.

Lack of rental housing will lead to its further increase in price. This will be accompanied by an increase in energy prices. So some people will be paying significant amount of their salary to the rent. In big cities, it will be a big issue of how to ensure adequate accommodation for students and for people with low paid jobs.

The Central Bohemian region has now an uprising real estate market because people working in Prague and thus having higher income are now buying properties in this region. That is why the Central Bohemian region and Prague – West district can expect a significant population growth over the upcoming years. This trend will not only concern areas around Prague, but it will also affect smaller towns and villages.

With Prague's salary it is possible to pay real estate in Central Bohemia region faster than it would be in Prague. That's why thousands of people who do not find adequate housing in Prague will go this region. This movement of people will create a new generation of Central Bohemians that are earning money in Prague and their homes lying next to Prague or far beyond its borders. Unlike the inhabitants of satellite towns, it will not be a sign of luxury, but rather a necessity. This is a big challenge ahead of Prague and the Central Bohemian Region, how to manage these changes, especially in consideration with transport infrastructure.

7. BIBLIOGRAPHY

Law:

Act No. 151/1997 Coll., § 3, *Act on valuation of assets*. [online]. Available on: <https://www.zakonyprolidi.cz/cs/1997-151#cast1-hlava1> [13.1.2019]

Act No. 89/2012 Coll. *Civil Code*, § 498 (1), § 506 (1). Available on: <https://www.zakonyprolidi.cz/cs/2012-89#cast1-hlava4-dil2> [5.1.2019]

Act No. 183/2006 Coll. *Law on Spatial Planning and Building Regulations (Building Act)*, §2. [online]. Available on: <https://www.zakonyprolidi.cz/cs/2006-183> [6.12.2019]

Act No. 256/2013 Coll. *The Land Registry Act (Cadastral Act)*. [online]. Available on: <https://www.zakonyprolidi.cz/cs/2013-256#cast1> [13.1.2019]

Act No. 359/1992 Coll., Act of the Czech National Council on Surveying and Cadastral Bodies. [online]. Available on: <https://www.zakonyprolidi.cz/cs/1992-359> [14.1.2019]

Act No. 151/1997 Coll. Property Valuation Act. [online]. Available on: <https://www.zakonyprolidi.cz/cs/1997-151#cast1> [13.1.2019]

Literature:

BRADÁČ, Albert. *Metodiky oceňování nemovitostí pro účely úvěrového řízení: vč. úvěrů hypotečních v České spořitelně, a.s.* Brno: Akademické nakladatelství CERM, 1995.

BRADÁČ, Albert. *Teorie oceňování nemovitostí*. 4. přeprac. a dopl. vyd. Brno: Akademické nakladatelství CERM, 2004. ISBN 80-7204-332-3.

KRČMÁŘ Jakub Bc. *Analýza a zhodnocení realitního trhu v Hradci Králové*. Praha 2017. Diplomová práce. Česká zemědělská univerzita v Praze. Provozně ekonomická fakulta. Podnikání a administrativa.

KUBANOVÁ, Jana. *Statistické metody pro ekonomickou a technickou praxi*. 2.vyd. Statist Bratislava: 2004. ISBN 80-85659-37-9.

MAIER, Karel. *Ekonomika územního rozvoje*. Praha: Grada, 2000. Města a obce. ISBN 80-7169-644-7.

ORT, Petr. *Oceňování nemovitostí a cenové mapy: praktický průvodce právní úpravou a problematikou související s trhem nemovitostí a jejich financováním, včetně cenových map*. Praha: Dashöfer, c2008-2009. ISSN 1803-5159.

SCHNEIDEROVÁ HERALOVÁ, Renáta. *Oceňování nemovitostí*. Praha: České vysoké učení technické, 2008. ISBN 978-80-01-04032-4.

ZAZVONIL, Zbyněk. *Oceňování nemovitostí na tržních principech*. Praha: CEDUK, 1996. ISBN 80-902109-0-2.

Internet:

Sreality.cz, (2019). [online] Available on: <http://www.sreality.cz/> [Accessed 15 Febr. 2019].

Odhad online, Nezávislé odhady nemovitostí. [online]. Available on: <https://www.odhadonline.cz/clanky/9-nemenne-principy-ovladajici-realitni-trhy/> [Accessed 25 Dec. 2018].

PODLEŠÁK Petr. Jak se budou vyvíjet ceny bytů v roce 2018 a co má na ceny vliv? [online]. Available on: <https://www.remaxalfa.cz/vyvoj-ceny-bytu/> [Accessed 17 Dec. 2018]

VODRÁŽKA Vojtěch, Analýza realitního trhu v dané lokalitě a možnosti financování nemovitosti (Bakalářská práce, Vysoké učení technické v Brně), Available on: https://www.vutbr.cz/www_base/zav_prace_soubor_verejne.php?file_id=92129&fbclid=IwAR2KQgEeEI7Plg-Shz7MVwOeGDqMsDI7NHgrIxtg4JJolQMvR4Mf2cnVSxY [Accessed 27 Dec. 2018]

Czech Statistical Office data. [online]. Available on: https://www.czso.cz/csu/xs/charakteristika_okresu_praha_zapad [Accessed 14 Jan. 2019]

Úvod do regresní analýzy. [online]. Available on http://www.statsoft.cz/file1/PDF/newsletter/2014_26_03_StatSoft_Uvod_do_regresni_analyzy.pdf [Accessed 1 Mar. 2019]

Co čeká realitní trh v roce 2019? [online]. Available on <https://www.hypoindex.cz/tiskove-zpravy/co-ceka-realitni-trh-v-roce-2019/> [Accessed 1 Mar. 2019]

Prague Housing Study. [online]. Available on <http://eceta.cz/wp-content/uploads/2018/09/Prague-Housing-Study-IV.1.pdf> [Accessed 1 Mar. 2019]

Figures:

Figure 1: <https://www.reflex.cz/clanek/komentare/46363/mate-pozemek-radeji-se-podivejte-do-katastru-urady-totiz-digitalne-vyvlastnuji.html> [Accessed 5 Mar. 2019]

Figure 2: https://cs.wikipedia.org/wiki/Okres_Praha-z%C3%A1pad#/media/File:Prague-West_District_2008_names_PZ_CZ.png [Accessed 15 Jan. 2019]