

Czech University of Life Sciences Prague

Faculty of Economics and Management

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Bachelor Thesis

Real Estate Analysis in Prague 5

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BACHELOR THESIS ASSIGNMENT

Martin Hofman

Economics and Management
Economics and Management

Thesis title

Real estate analysis in Prague 5

Objectives of thesis

The goal of this bachelor thesis is to analyze real estate market in Prague 5. Using regression analysis will be determined, how certain factors influence the price of real estate. The result of regression analysis will be explained and in conclusion, with regards to the results will be made a forecast of the real estate market in Prague 5.

Methodology

This bachelor thesis will include theoretical part and practical part. The theoretical part will bring crucial knowledge of the selected topic. It will explain terms and principles from the field of real estate, that will be used in this bachelor thesis.

In the practical part, the data used were collected from certain real estate agencies websites: Sreality.cz, M&M reality, RE/MAX. These data about flats offered in 2020 in Prague 5 will be used to build regression analysis model, which will be made in MS Excel. The main goal is to find out if street Plzeňská has a negative impact on a price of a real estate around.

The proposed extent of the thesis

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Keywords

real estate, mortgage loan, hedonic pricing method, supply, demand, flat

Recommended information sources

Albert Bradáč, Josef Fiala, Vítězslava Hlavínková – Nemovitosti Oceňování a Právní Vztahy

Daniel D. Singer – The Real Estate Investment Handbook (Frank J. Fabozzi Series 160)

David Dušek – Základy Oceňování Nemovitostí

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Declaration

I declare that I have worked on my bachelor thesis titled "Real Estate Analysis in Prague 5" 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 any copyrights.

In Prague on 11.3.2021

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Real Estate Analysis in Prague 5

Abstract

This bachelor thesis aims to analyze situation of the real estate market in Prague 5. Using regression analysis, the thesis will discover which factors have the most influence on the pricing of properties.

The thesis is divided into two main parts. The first part is theoretical, which includes general characteristics of the terms from real estate market. The second part is practical part, which consist of analysis of real estate market in Prague 5. Using regression analysis, will be determined important factors influencing price and the main goal of this part is to determine influence of Plzeňská street and its traffic on eventual price of a property. The final part of the thesis will consist summary of the result of regression analysis and an expectation of the development of pricing in the future years.

Keywords: real estate, real estate market, property, price, real estate evaluation, price determinants, Prague 5, regression analysis, HPM

Analýza nemovitostí v Praze 5

Abstrakt

Tato bakalářská práce má za cíl zanalyzovat situaci na trhu s nemovitostmi v Praze 5. S pomocí regresní analýzy budou zjištěny faktory, které mají největší vliv na oceňování nemovitostí.

Práce je rozdělena do dvou hlavních částí. První část je teoretická, obsahuje charakteristiku pojmů z trhu s nemovitostmi. Druhá část je praktická, obsahuje analýzu trhu s nemovitostmi v Praze 5. S použitím regresivní analýzy se určí důležité faktory, které mají vliv na cenu nemovitosti a hlavním cílem této části je zjistit vliv Plzeňské ulice a provozu v ní na konečnou cenu nemovitosti. Závěrečná část práce obsahuje shrnutí výsledku regresivní analýzy a očekávání vývoje oceňování nemovitostí v budoucích letech.

Klíčová slova: nemovitosti, trh s nemovitostmi, majetek, cena, oceňování nemovitosti, determinanty ceny, Praha 5, regresivní analýza, HPM

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List of abbreviations

CZK – Czech Crown

LTV – loan to value

APR – annual percentage rate

$\mu\text{g}/\text{m}^3$ - The concentration of an air pollutant given in micrograms per cubic meter air

s.m. – square meter

1 Introduction

The real estate market represents an important role to any country and any citizen in it. It is a place, where people seek or offer a property. Real estate plays an essential role in people's lives, and it is often the biggest decision of their life they make. Buying a property, for most people, is a huge commitment. They usually finance their property using mortgage loans, in 56 % people have loans for 25 to 30 years and in 17 % for 20 to 24 years (ČBA, 2020). This makes the mortgage loan a huge commitment for basically whole active life.

The real estate market also affects the state it represents a huge way of income from taxes. Until spring 2020 buyers had to pay 4 % from the buying price to state as taxes, this law is no further valid. Today the only tax, which is the seller obligated to pay is income tax. It represents 15 % of possible earnings the seller may have, when selling his property. This means that if a seller bought a property for 1 000 000 CZK and later sells it for 2 000 000 CZK he is obligated to pay taxes in value of 15 % of earned 1 000 000 CZK, which is 150 000 CZK. As soon as buyer gains the property, he/she is then obligated to pay every year a property tax, which is determined by certain financial office. Today real estate is also used as investment. People have gone through economic crisis and economic ups and downs and have suffered from many losses in their savings especially in 2008. And since the will of people to save money decreased, they started investing to more stable investment: the real estate. More people investing to real estate led to increase of real estate prices and this trends still, continues. In last few years, the most important role for investing into real estate had a service Airbnb. It is a web service, which connects the owner with a renter, mostly interested in a short-term rental. Currently there are approximately 15 000 flats in Prague available for Airbnb service and in 2019 more than 10 % (1 937 000) of tourists visiting Prague used Airbnb services (Lidovky, 2020). Flats represent investment with high rate of return, the demand for renting them is very high, on the other hand, the most stable, and best keeping value real estate are the parcels.

Since the prices of real estate in Prague increased rapidly, people now must seek for their homes further from the capital city, where they can gain bigger property and still be able to work in Prague, where the salaries are known to be higher. In first quarter of 2020

the average salary in Prague was 42 760 CZK (ČSÚ, 2020). On the other hand, in the whole Czech Republic, it is 34 077 CZK (ČSÚ, 2020). This makes Prague very attractive place to live and work.

The price of real estate is determined by many factors, these can be type of real estate, position, age, accessibility, environment, etc. For people, who are expecting return on investment is most important, how risky their investment is and if their investment will be able to cover interest rate of mortgage loan in some cases.

2 Objectives and Methodology

In the following part the objectives and goals of this bachelor thesis will be explained.

2.1 Objectives

The aim of this bachelor thesis is to analyze and evaluate the factors influencing the price of real estate in Prague 5. And to decide if there is a significant impact on pricing by an approach of a street Plzeňská, which is considered, to be a place with busy traffic, which produces pollution and may affect price of real estate in this area.

The main question is whether the approach of an apartment from street Plzeňská represents a negative factor influencing the price of it. The practical part will also explain, which other factors influence the price of real estate and their importance on the price. To find out how significant effect has the distance from the street Plzeňská hedonic price method will be used.

Goals:

- Identification of the main factors influencing the price.
- By using regression analysis evaluation importance of certain factors.
- Evaluation of results.

2.2 Methodology

This bachelor thesis will include theoretical part and practical part. The theoretical part will bring crucial knowledge of the selected topic. It will explain terms and principles from the field of real estate, that will be used in this bachelor thesis.

In the practical part, the data used were collected from certain real estate agencies websites: Sreality.cz. These data about flats offered in 2020 and 2021 in district Prague 5 will be used to build regression analysis model, which will be made in MS Excel. The main goal is to find out using hedonic pricing method if the street Plzeňská has a negative impact on a price of a real estate around. The results from regression analysis will display price determinants and these results will be verified.

3 Literature Review

In this chapter certain terms and rules from the studied field will be explained.

3.1 Basic Definitions

In field of real estate are many important definitions, that should be known. The need for understanding this area of interest will probably meet everyone in his or her life. Spreading knowledge about real estate definitions, rules and behavior from this field will definitely help to bring justice and decrease number of frauds related to this area.

Real Estate

Since 01.01.2014, new law has come in place The Civil Code Act. No. 89/2012 Coll. defines movable and immovable things as: *“Immovable property is land and underground structures with a separate purpose, as well as material rights to them, and rights that are declared immovable by law. If another legal regulation stipulates that a certain thing is not a part of the land, and if such a thing is not transferable without violating its essence, it is also an immovable thing. Any other things are considered movable no matter if their essence is intangible or intangible.”* (Civil Code, 2012).

Regarding to the current legislation, land is considered immovable property and building on a land attached with solid foundation is also considered immovable thing.

The Estate

Regarding to Act. No. 256/2013 Coll. *“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 18 right of construction, the boundary of the types of land, or the interface of the way of land use”* (Civil Code, 2013)

3.1.1 Evaluation of Real Estate

We can consider valuation as a process leading to giving a value in financial equivalent. In the Czech Republic, the legal system offers two types of evaluation, the choice depends on the need and purpose of evaluation.

Administrative valuation Act. No. 151/1997 Coll. is based on clearly defined procedures and steps from the law about real estate evaluation. The main purpose of this evaluation method is in calculating taxes related to real estate (Civil Code, 1997). This way of evaluating is not very popular, the states that use this type of evaluation are usually countries from former eastern bloc.

The second type is market evaluation, the eventual value calculated by these two types very often differs. The evaluation based on market circumstances does not have any strict rules, it is based on scientific methods and the choice of method is up to the concrete valuer. Market valuation is mostly used in field of mortgage loans, trials, selling or settling of heritage. Very often these two kinds do not meet the same result in evaluation. To achieve similar results the decree is amended once a year to change parameters of administrative evaluation.

For evaluating of real estate these concrete methods can be used:

- **Comparing method:** direct or indirect comparison between offered real estate and other real estate with similar parameters and in similar condition.
- **Method of determining the material value:** it is based on the purchase price and the depreciation caused by usage.
- **Method of determining the usual price using the coefficient of sale:** average ratio between selling price and value of real estate and then multiplied by coefficient of real estates present price.
- **Method of rentability:** based on the profit, which the real estate brings to the owner.
- **Index method:** recalculating price using indexes.
- **Evaluating using accounting method.**

For a proper evaluating of real estate (land) and regarding to building code are divided into several groups. For the evaluating purposes, according to Act no 151/1997 Coll. Section 9 are used these groups:

For purpose of evaluating the lands:

1. **Building site**, they are defined as: *“land or its part or group of lands, which was determined as a land, where can be built a building. This decision is made by regulatory plan or regional/local decision”* or *“built up building plot is a land registered in the cadastre of estate as a building plot and another building plots with common fence, making unit with residential and economical buildings...”* (Civil Code, 1997).
2. **Agriculture lands**, registered in cadastre of real estate as: fertile ground, hop garden, vineyard, garden, orchard, and permanent grassland.
3. **Forest land**, registered in cadastre of real estate and forested lands, which are not registered in cadastre of real estate.
4. **Lands**, which are registered as water surfaces in the cadastre of real estate.
5. **Other lands**, which are not included in options 1 to 4 (Civil Code, 1997).

These groups are used for further evaluating of building plots:

- Lands without any building.
- Built-up lands.
- Areas of land, which is built up, regardless the registration in the cadastre of estate.

Parcel

Parcel is a land, which is geometrically and positionally designated, it is marked in the cadastre of real estate and labeled with parcel number. Its acreage is expressed by area in square metric units rounded to square meters. Whole land can consist of many parcels.

Building parcel

Building parcel is a land registered as a built-up area and courtyard.

Land parcel

Land parcel is a land which is not a building parcel.

3.1.2 Building

A building is product of building process, which is possible to characterize by its kind, purpose and usage. It is meant to be single building project (A. Bradáč, 2016).

Regarding to building law for the purpose of valuation, buildings are divided into several groups:

- Land-based buildings,
- engineering and special ground buildings,
- water tanks and ponds,
- other constructions (Civil Code, 1997).

Anyone willing to reconstruct or build a new building needs planning permission or developmental approval, which is a necessary license needed for anyone, who wants to reconstruct or to build a new building. The rules to gain it differ in every state, in the Czech Republic it is given by the Building Authority. The planning permission is needed for any building exceeding area of 150 m², or if it intervenes into other buildings. In case of smaller reconstructions, the changes must be reported to certain building authority, but do not need to be approved. Everyone asking for the approval must fill certain forms and the waiting period for approval is from 30 to 60 days and the price for it is between 300 CZK and 3000 CZK. It is possible to appeal to negative response from building authority. In the Czech Republic, the process of gaining the approval is very difficult. In average it took 246 days in 2019 to get the building approval. In neighboring countries of the Czech Republic, the process is much more comfortable and faster (Finance, 2020).

3.2 The Cadastre of Real Estate

The cadaster of real estate is a collection of data about real estate in the Czech Republic. It includes geometrical data and location of all estate listed. Records of ownership and other substantive laws associated with certain properties are a part of it. It is open to public and it is used for taxes purposes, protection of the environment, agriculture and forest fund, mineral resources, culture monuments, area development, scientific purposes, economic and statistical purposes, creation of other information systems, and also for valuation of a real estate. The most important activity of real estate cadaster office is to care about collecting records of ownership rights to real estate.

The cadaster works as an information system about territory of the Czech Republic.

Its two main components are:

- A set of geodetic information, including the cadastral map.
- A set of descriptive information, which consist of data on cadastral areas, buildings, flats, plots, non-residential spaces, owners, legal relations and rights and facts determined by law (SALSC, 2020).

3.3 The Price and Value of Real Estate

The price of any real estate depends on many factors. These are: location where the immovable property is situated, age of the immovable property or its condition determining the need for reconstruction, or the consumption of certain real estate. When these factors change, then the price of the real estate changes as well. The government taxing policy represents also an important factor influencing the prices. The value and the price in real estate valuation differ. The price represents the demanded offered amount of money for the property, on the other hand value represents economically the usage, which it brings to the owner. The estimate of the value of real estate may differ from its price. In the Czech Republic mostly, even professionals do not distinguish between the price and the value (D. Dušek, 2011).

The price

The price of a real estate can be generally understood as offered and demanded, in most cases it may be certain amount of money, which may or may not represent a real value of the real estate. Price can be determined by an agreement of both sides participating in the transaction.

The value

The value of a real estate is representing its usage value for certain customer. It is not the same as the price, which is a result of an agreement of seller and buyer. The value determines, what benefits it gives to a possible owner.

The purchase price

The purchase price represents the price of real estate on the date, when it was built and when it was completely new, it does not count with using up the real estate (A. Bradáč, J. Fiala, V. Hlavinková 2007), which is decreasing the price. Regarding to accounting law Act No. 563/1991 Coll., purchase price is: “*price, for which the property was acquired and related costs*” (Civil Code, 1991).

The market price

For the market price it is possible to sell a real estate on a free market. The price should be a result of an agreement between seller and buyer. It is a reflection of the current state of demand and supply in the market in a given time and location.

The unit price

The unit price determines price for one unit in case of market with real estate, these units can be square meter, are or hectare. The are is equal to 100 square meters and hectare is equal to 10 000 square meters.

Factors influencing the price

In general, these factors can be considered as very important influencers of real estate price and value:

- Location.
- Availability of public transport.
- Condition.
- Floor.
- Elevator.
- Cellar.
- Parking.
- Balcony.
- Orientation.
- Distance to city center.
- Citizen services.
- Hospitality.

Generally, it is assumed that location is one of the most important factors making the price of a real estate. Potential of location always has to be considered. Location in a city of Prague is very advantageous, because of the services the city offers. Real estate located in big cities like Prague can offer good hospitality, schools, state offices, hospitals, etc.

The Size of an apartment plays another essential role in price making, confusing may be the fact that in a same apartment house is a flat of a size with 30 square meters, with a different price for 1 square meter than a flat with 80 square meters situated in the same place and in the same conditions. In an apartment house another important factor is the presence of an elevator.

Windows orientation and presence of a balcony also influences the price, the potential buyer can be searching for south oriented windows or balcony, which is good for the winter and cold months of the year, on the other hand, for hot summer this orientation will probably ask for a cost of air conditioner. Overall flats with windows oriented to more than just one world side have bigger potential than others. Regarding to Remaxalfa (one of the biggest real estate agencies in the Czech Republic), price of a balcony is in most cases equal to half of the price for 1 square meter of the real estate. Flats, that have a private terrace, loggia or a balcony are usually more attractive. Apart from practical considerations, view outside of flat is also important. View into a beautiful city is more valuable than a view into rush and busy street.

The condition of a flat also represents price making factor. The better the conditions are the higher the value is. The condition of the whole apartment house also makes the price, and it can also show, how people living inside can cooperate and care for their common real estate. Relationship with neighbors and possible cooperation with them can also affect the price and value of a real estate (RemaxAlfa, 2020).

3.4 Financing of properties

Financing of properties can be ensured by using buyers own financial resources or bank loan. In the Czech Republic banks provided mortgage loans in the value of 217 billion of Czech Crowns in 2020. Compared to year 2019 (162 billion CZK) the volume in

2020 is 34,3 % higher. In 2018 the volume of mortgage loans was 187 billion CZK. These statistical values include only new mortgage loans and increases in older mortgage loans (ČNB, 2020). The current situation caused by the pandemics of COVID – 19 caused that people are afraid to lose their own cash saving, and many have decided to invest to the real estate, which is considered more stable and less risky thing to invest to.

Mortgage loan

A mortgage loan is a long-term loan ensured by pledge right to a real estate, which is meant to be used for living and it is registered in cadastre of real estate. It can be also used to finance reconstructions or refinancing of other loan, which was used to finance a real estate. When dealing with common ownership or heritage shares, mortgage loan can be used as well. Mortgage loan is usually paid with monthly payments and most usually it is set to be repaid from 5 to 30 years (Moneta, 2020). Mortgage loans can be divided into to groups distinguished by its purpose. First of these types is purpose mortgage, this type of mortgage loan is used to finance the purchase or reconstruction of a real estate. The loan can only be used for purposes associated with real estate, the debtor is obliged to prove, what exactly was the loan used for.

The second type is non – purpose mortgage loan, also known as home equity (in the Czech Republic it is called “American mortgage loan”). The main difference is that the debtor can use this loan to finance anything he/she wants, there is no obligation to prove the expenses to the bank. This type is usually for people, who already own certain property/real estate and they can use this property as a collateral to the bank. Since the bank will have the property from the debtor as a collateral, the risk for the bank is much lower and therefore the loan will be for the debtor much cheaper.

Definition of mortgage loan from Act. No. 190/2004 Coll. is: *“mortgage loan is a loan, which’s repaying including appurtenances is ensured by pledge right to the real estate or real estate which is already being built. Loan is considered as mortgage loan on a day, when legal effects of pledge right are established”* (Civil Code, 2004).

Every applicant asking for a mortgage loan must be at least 18 years old, who has permanent residence in the Czech Republic. Bank is assessing the applicants to find out, what is going to be his ability to repay like. For every applicant is therefore necessary to

display sufficient volume of income from occupation, business, income from rent or pension. The applicant is obligated to show a good paying history. Unpaid liabilities or execution can lead to refusal for application. Banks in the Czech Republic are using two lists of clients. The first is BRKI “bank register of client information” and the second NRKI “non-banking register of client information”. These both help banks to evaluate creditworthiness of a client. The requirements that the bank has on a possible client are mostly coming from rules, which are set by the Czech National Bank. These limits are often changing and in 2018 one of the limits was, that the borrower could only lend a mortgage loan in the volume of his/her year net come multiplied by 9 (index DTI “debt to income”) and also the applicant should not spend more than 45 % net monthly income (index DSTI “debt service to income”). The Czech National Bank stated that only 5 % of given mortgage loans do not have to meet previously described criteria. Another limit the Czech National Bank sets is the index LTV (loan to value) this measure should help the applicant decide, whether the mortgage loan is sustainable or not. The LTV index is a ratio between volume of mortgage loan and value of mortgaged property times 100. The result should not exceed 90 %. All banks offering loans should consider these limitations stated by the Czech National Bank in order to lend money to creditworthy customer, who will be able to pay off the borrowed amount of money (CNB, 2021).

Interest Rate

Interest rate is a percentage expressed increasement of borrowed amount of money during certain time period. Interest rate determines how much the debtor has to pay for a loan. It can be fixed, which will be the same for the whole time or variable, which can be changed any day. There are many factors influencing the value of interest rate some of them are: inflation, time of fixation, in some cases exchange rate, the certainty about the ability of debtor’s creditworthiness can also change the value of interest rate. For someone searching for a mortgage loan it is important to know what the Annual percentage rate is going to be. The APR is necessary fact, that the applicant needs to know to be able to assess advantages or disadvantages of offered loan. APR determines percentage share of the debt, which the debtor must pay annually. This value includes all repayments, administration fees and other costs associated with drawing the credit.

Mortgage Loan Repayment

There are many ways, how a mortgage loan can be repaid. These are some of the basic types, which are usually used.

- **Degrressive Repayment** – this type of mortgage loan can be described as loan, when at the beginning of repaying the debtor repays higher amount and during the period the repayments are decreasing. Advantage of this mortgage loan type is, that the debtor will pay less interest, then in the other types.
- **Progressive Repayment** – this kind is opposite to degressive repayment, the repayments are at the beginning low and during time their value increases, therefore this type of mortgage loan repayments may suite someone, who does not have a high income, but is expecting to get higher income in the future.
- **Mortgage Loan with Annuity Repayment** - this method is one of the mostly used type of loan repayments. The repayments are in this case constant, they do not change during the repaying period. The only change may occur when the interest would change. This type of mortgage loan is very simple and clear. The annual repayments are composed of two parts the interest and amortization. The amortization represents the repayment of the principal and the interest represents certain cost associated with the loan, which is the creditor asking for. The ratio between amortization and interest is changing. At the beginning, the bigger part of repayment represents the amortization and gradually is the amortizations part in repayment decreasing. The formula to count the annuity repayment goes as follows:

$$v = \frac{1}{1+i} \quad (1)$$

$$a = D * \frac{i}{1 - v^n} \quad (2)$$

- a** annuity,
D loan amount,
n loan maturity in years,
v discount factor
i annual interest rate,
(Dvořák, 2005).

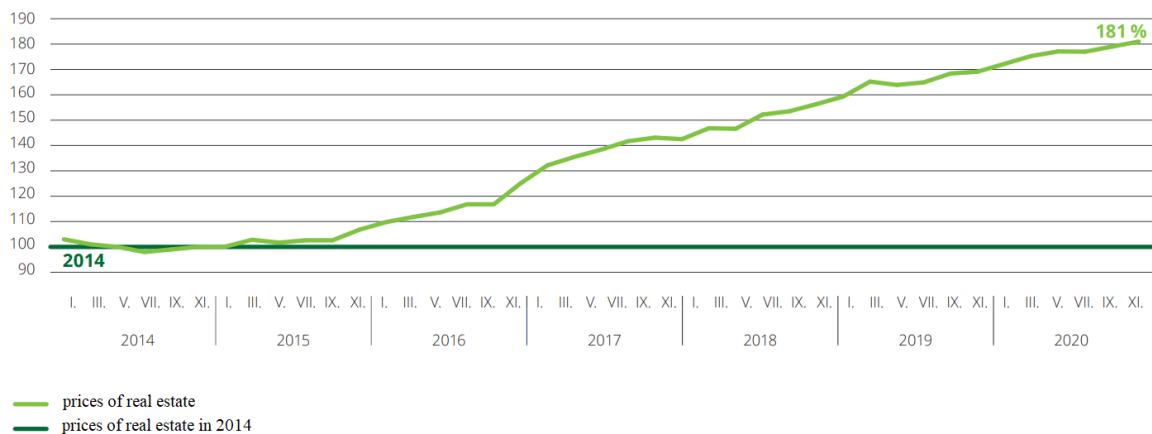
4 Practical Part

At first the analysis of real estate market in Prague and the description of problem of pollution will be done. Then the practical/analytical part will be focusing on real estate market in Prague 5. In this district of Prague is located street Plzeňská is located, which is considered a pollutant. The main goal is to find out, if the location close to the street represents a negative price making factor of real estate.

4.1 Real Estate Market Analysis

The capital of the Czech Republic is a demanded place to live for many reasons, one of them may be the fact, that the wages in Prague are higher, than in other parts of Czech Republic. The higher income is also associated with higher prices of real estate. The long-term trend in following figure (Figure 1) shows, how the prices of real estate behaved in period from 2014 to 2020.

Figure 1: Development of price of flats in Prague

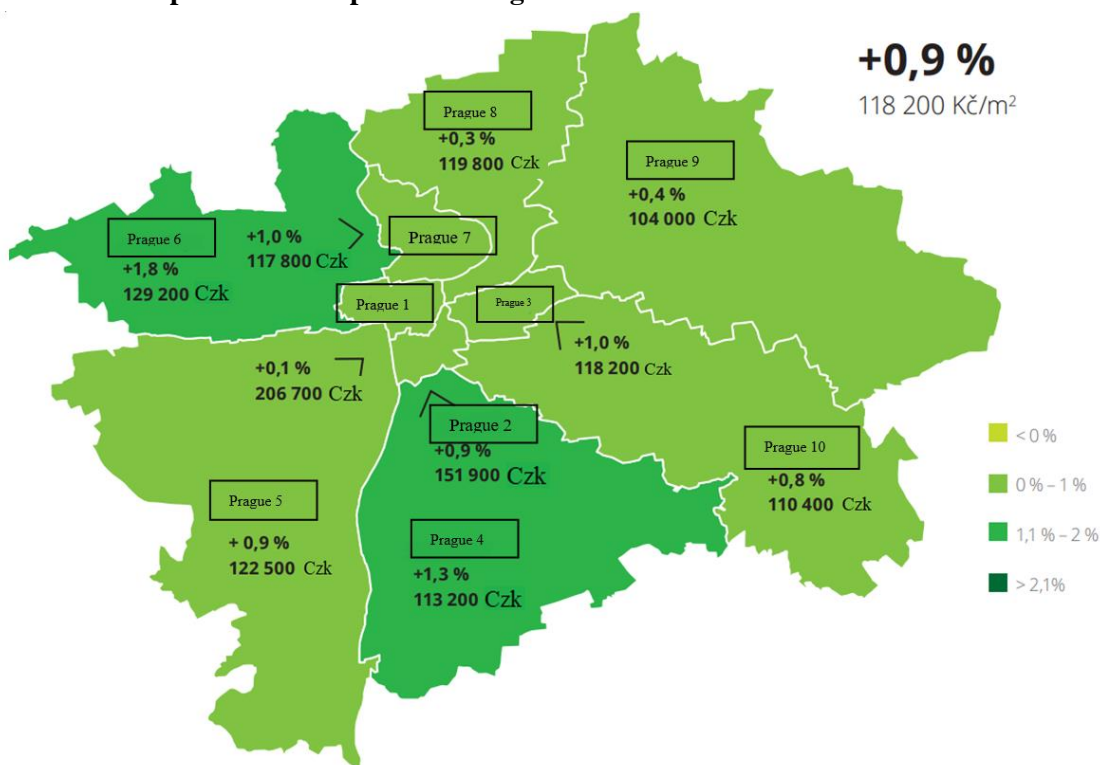


Source: Deloitte, 2021

The figure (Figure 1) shows, how much the real estate prices are increasing. In the last year the whole world was hit by pandemic caused by disease COVID - 19, which in most countries resulted in huge economic problems. Many companies had to close due to new government restrictions and the economic growth slowed down. The GDP of the

Czech Republic decreased by 5,6 % compared to 2019 (Kurzy, 2021). The reasons for this huge decrease were, that people and companies invested less into their businesses, household expenditures decreased, and international trade suffered as well. Despite these observations the real estate prices in Prague kept the value and the prices of real estate in Prague kept their increasing trend. The Following map (Picture 1) of prices explains, how the prices changed in period of September 2020 and October 2020. During a month average prices of new flats in Prague increased almost by 1 %.

Picture 1: Development of flats prices in Prague



Source: Deloitte, 2021

4.2 Real Estate Market During Period from 2020 to February 2021

Year 2020 was strongly affected by international crisis caused by pandemic of disease COVID – 19. This pandemic crisis influenced everyone. During year 2020 people had to change their ways of lives. The Czech government was trying to fight the pandemic with certain restrictions. Some of these restrictions were closing of schools, restaurants, sports ground or eventually closing borders. All these restrictions slowed down the growth of economy. The income from foreign investors decreased, people, who bought flats as

investment were facing problem with tenants, who got to financial problems due to the pandemic, the real estate owners had to usually sale on the rent they were asking for. Other issues were facing owners of flats used for Airbnb. Due to the state boards closure, these flats mostly used by foreign tourist stayed empty. The exit of foreign workers, students or tourists resulted in higher offer of flats offered for rent.

The rental price is in the case of functioning market an influencing factor of demand for real estate (P. Ort, 2008). Unfortunately, the crisis still continues, and without the foreign investors/renters the supply of real estate offered for rent will be increasing, which may also lead to decreasing of prices for rent eventually leading also to decrease of real estate prices.

Many people, who had their real estate as an investment used for rent decided to sell their property, because of its low returns. The people, who decided to sell their property, pushed the prices of other properties down. This trend is expected to be only short – term. It is expected, that as soon as the pandemic crisis will be over and the borders will be opened to everyone and the travelling will be easy and safe, then the prices will increase in high rate as they did before the crisis. The crisis is expected to change prices of older flats usually from panel construction on edges of cities and towns, this expectation is because the most affected people by crisis are people from middle class and lower. The prices of these flats are estimated to drop by 10 % - 15 %. Therefore, people thinking of selling their property like this may not wait much longer with deciding (Maxima Reality, 2021).

The growth rate of real gross domestic product decreased by 6,5 % in 2020, which is even bigger change then it was in 2009 due to financial crisis which was the Real Estate Bubble and caused the decrease by 4,7 % (Statista, 2021).

The crisis caused by COVID – 19 is expected to affect the future less than it the crisis in 2009 did, and therefore those, who do not necessarily need to sell their real estate should wait until the situation will improve and then the prices of their property should increase the same way it did before the crisis. The prices of real estate are not expected to decrease mostly because that in big cities the demand for flats is still higher than the supply and therefore the situation on the real estate market is considered stable.

4.3 Hedonic Pricing Method

In the practical part hedonic pricing method will be used to find out if the street Plzeňská in district Prague 5 influences the price of real estate around and how much the existence of this street influence eventual price of a real estate. The hypothesis is, that the further from street Plzeňská the flat is, the higher will be its price.

4.3.1 History of Hedonic Pricing Method

The first description and formal summary of working with hedonic pricing method were made by: Court in 1941 and Tinbergen 1951. Despite the history of this method is quite long the popularity of using is still very high. The reason for this is, because it can determine decomposition of housing costs into values and quantities. And regarding to work of Timothy J. Bartik and others, the first usage of hedonic pricing method was in in 1939 in a car producing company GM (Bartik, 1987).

In GM economist Andrew Court worked on a problem, how one single horse-power unit affects the price. He is considered, to be the first person ever to come up with concept of “hedonic pricing”, which explains relative importance of individual elements in his case these were: power, brakes, width of seats, windows width, and tire size on final price of a car.

Study by Ridker and Henning from 1978: “The Air Pollution and Property Value Debate: Some Empirical Evidence” is considered, to be one of the first studies dealing with application of hedonic pricing method on real estate market. Their study was about air pollution and its effect on real estate market (Ridker, Henning, 1978).

4.3.2 Regression Analysis

The key to the hedonic pricing method will be a regression analysis, it is a method used to find out dependence of certain quantitative variable to one or more other quantitative variables. At the beginning of building the regression analysis model the role of each variable must be set, they can be whether independent (explaining) or dependent (explained/response). The number of variables can vary. In case of working with one

explained variable and one regressor, when having these variables only simple regression model would be used. The second composition consist of one depended variable and more independent variables.

4.4 Variables Used in Regression Model

This bachelor thesis goal is to find out the relationship among certain variables affecting price of apartments in Prague 5 situated closely to street Plzeňská, which is considered as a huge air pollutant and, also noise pollutant. The street is an important transport connection in Prague (Enviweb, 2019).

4.5 Air pollutions limits

In the Czech Republic, the pollution of air is measured by measuring stations situated in lower layer of atmosphere. These measurements are compared to limits stated by law. The limits in the Czech Republic have origins in guidelines given by the European Union, which is about quality of outside air and cleaner air for Europe. The limits given by the European Union were used as a base for the Czech legal system dealing with pollution. One of the most important rules and guidelines from 2008/50/EC is that if the limits stated are exceeded, then ministry of environment has 18 months from the end of year, when the limits were exceeded, to invent a program to improve air quality of certain area. The European guideline is asking for dividing areas to zones, which have different limits of pollution. (EUR-Lex, 2008)

The capital of Czech Republic is for many years one of the more polluted places in Czech Republic. This problem is mainly, because of high traffic and burning of solid fuels in households (Portalzp, 2018).

4.5.1 Noise pollution

Noise represents another problematic pollutant it can lead to stress, hearing problems, etc. In area analyzed in this work the noise pollutant is meant to be traffic from

street Plzeňská. Another noise pollutant could be air traffic because of nearby airport. Organization WHO marked noise pollution as second most dangerous factor influencing health (EEA, 2020). The exact limits for noise, which can negatively affect healthcare of people are in Civil Code Act No. 272/2011 (Civil Code, 2011). Regarding to plan aiming to reduce noise in Prague from 2019, street Plzeňská is on a priority list of areas with huge pollution with need of a quick change (Portalzp, 2019).

4.5.2 Characteristics of Street Plzeňská

The street is situated in district of Prague 5. It leads in east-west direction. It begins on a crossroad Anděl in the center of Prague and ends on the west side of Prague close to Zličín. It is one of the most important traffic hubs in city of Prague. Most people coming from western part of the the Czech Republic or for example city Pilsen use Plzeňská as the best way to get to the city center. Almost the whole street offers to drivers 2 driving stripes in both directions and apart from private transport people can use buses, and trams. The intensity of trams traffic is supported by tram depot located very closely to the street. A study concerning noise pollution in Prague listed many of street connected to Plzeňská as very huge noise pollutants some of these streets were: Nádražní, Štefánikova, Lidická. All these streets have the intensity of trams traffic higher than 1 100 trams per day.

Regarding to a study from 2019 (Portalzp, 2019), the volume of vehicles, that have driven through the street was from 30 100 to 38 398 vehicles per 24 hours. The following picture (Pictrue 2) is displaying the whole street Plzeňská in Prague.

Picture 2: Street Plzeňská



Source: Mapy.cz, 2021

In 2017 the city of Prague using measuring stations reported results of measuring air pollutions. The results reported exceeding of daily emission limits at 5 out of 15 measured stations. One of the 5 locations was a station at Prague 5. The good result was that the year emission limit was not exceeded on any of measured locations. The stations were measuring concentration of PM (particulate matter), which is a simple term for mixtures of solid or liquid particle suspended in the air. The composition, size, form and concentration affect health of living beings. Short-term exceeding of limits results in heart diseases, respiration problems, etc. Long-term exceeding of limits leads to decreasing of lung functions, chronic inflammations, and overall higher mortality due to heart diseases and lung cancer (Elzprava, 2017).

In Prague 5 was the daily limit exceeded 41 times in 2017 (the limit should not be exceeded more than 35 times). The highest measured concentration was $161,3 \mu\text{g}\cdot\text{m}^{-3}$ (the limit is $50 \mu\text{g}\cdot\text{m}^{-3}$). The measurement was also done in location of Suchdol, where is situated Czech University of Life Sciences and the results were much better. Maximum concentration measured was higher: $179,5 \mu\text{g}\cdot\text{m}^{-3}$, but the daily limit was exceeded only 29 times, which is below, the set limits.

Table 1: Measurements of air pollution

Location	N. of days when limit was exceeded	Max. 24h concentration ($\mu\text{g}/\text{m}^3$)
Prague 8 - Karlín	36	175,2
Prague 5 - Smíchov	41	161,3
Prague 4 – Chodov	25	155,3
Prague 6 – Suchbátov	29	179,5
Prague 8 - Kobylisy	23	159,6

Source: Elzprava, 2017

The table above displays some results of measurement from other parts of Prague to demonstrate, that Prague 5 is having serious problem with pollution, when compared to other districts of Prague. The data used in a table are from (Elzprava, 2017).

4.6 Regression Analysis Model

Before building the statistical model, the attributes chosen to be used must be described and characterized.

The data collected for regression analysis come from certain, public real estate servers. These data include 73 samples. These data only about flats offered for sale are from period from second half of year 2020 and beginning of 2021.

Explaining variables:

- **Price of a square meter of a flat** – price will be in CZK.

Explained variables:

- **The flats area** – represents total area in square meters, excluding areas of balcony, cellar, terrasse or other places belonging to flat. (expected trends: the bigger the area is, the higher the price of flat).
- **Number of living rooms** – attribute reporting number of rooms. (expected trend: the more rooms the higher price of the flat).

- **Flat condition** – the condition of flat may have different value for different possible buyers. The need for reconstruction may represent a problem for someone on the other hand someone may see it as an opportunity for building in his/her own way. The same problematics may be seen, when considering the age of the real estate. The condition will be divided into two groups regarding to the age or possible need for reconstruction. Value 1 represents flats in good condition and value 0 for old flats or flats in bad condition.
- **Number of floors** – characterizes the location of flat in a building. (expected trend: the higher the floor the lower the price).
- **Elevator** – In building with an elevator, it is expected that the higher the floor is, the higher is the price.
- **Balcony** – yes/no (expected trend: existence of balcony means higher price).
- **Composition of building** – buildings may be from bricks or panels. (expected trend: buildings made of bricks, skeleton or mixed have higher price).
- **Distance to public transport** – attribute is represented in meters from nearest public transport station (expected trend: the less meters from the station the higher the price). Distance is measured in walking distance.
- **Distance to a city center** – for purposes of this work Oldtown square was chosen to represent the city center. The distance will be measured in meters in air distance (expected trend is that the closer to the city center the more expensive the flat will be).
- **Distance to public transport** – attribute is represented in meters from nearest public transport station (expected trend: the less meters from the station the higher the price). Distance is measured in walking distance.
- **Distance to a city center** – for purposes of this work Oldtown square was chosen to represent the city center. The distance will be measured in meters in air distance (expected trend is that the closer to the city center the more expensive the flat will be).
- **Distance to street Plzeňská** – regarding to measures from studied area of Prague 5, mostly with regards to street Plzeňská and fact, that traffic represents huge source of pollution the expected trend is that this variable will have a negative impact on a price, which will mean, that the eventual price of a flat will be lower, generally,

the expectation is that the closer to the street the flat is the lower is its price going to be. The distance was measured using application mapy.cz.

Distance to the street Plzeňská was measured in meters in air distance to the closest point from the street. For better understanding all these variables are merged into a following table with their expected effect on price. They are divided into three groups structural (attributes explaining flats dimension and composition), location (surroundings of a flat), environmental (distance to the polluting street Plzeňská). The ability of a real estate to generate income for the owner/investor is associated with the location, for real estate, location is the main price determinant (Haight G.T., D.D. Singer, 2005).

Table 2: Price making factors

	Attribute	Expected influence	Variable
Structural	Area	+	X ₁
	Number of living rooms	+	X ₂
	Flat condition	+	X ₃
	Number of floors	+	X ₄
	Elevator	+	X ₅
	Balcony	+	X ₆
Location	Distance to the street Plzeňská	+	X ₇
	Distance to city center	+	X ₈
Environmental	Distance to public transport (distance to traffic)	-	X ₉

Source: Own work, 2021

The statistical model can be characterized as a function of price (P) explained by variables (x), which characterize the real estate (Van Den Bergh, 1999).

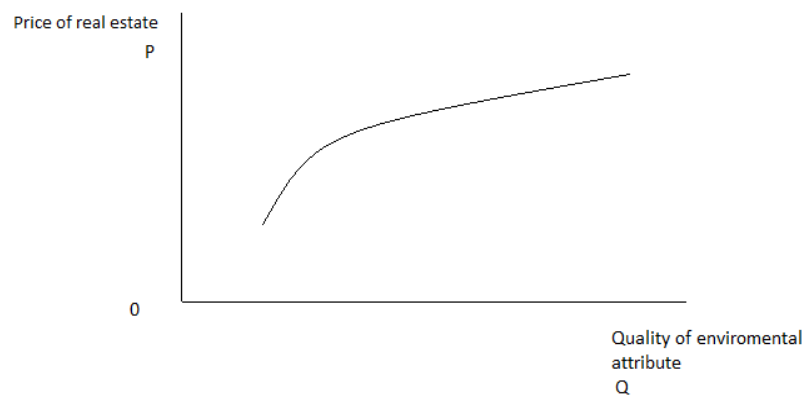
$$P = P(x)$$

Therefore, every single real estate can be described using variables (x),

$$y = (x_1, x_2, \dots x_k)$$

Most important variable is the price, all the flats in the data set were offered for sale and not for rent. Therefore (P) represents purchase price of a certain real estate (in the regression model the price was recalculated into price for one square meter). Explaining variables to be used in the model (x) will be divided as previously mentioned to three groups: structural, location and environmental. The model with variables organized into this group will look like this. The following graph (Figure 2) explains function of hedonic pricing, which states, that positive change of environmental attribute means increasement of price. For example, flat situated close to a city park will have higher price than flat further. And the opposite way real estate close to a coal power plant will result in lower price of a real estate. And in case of this thesis if the pollution from the street would improve and would not be so harmful to health, then the prices of real estate would increase.

Figure 2: Hedonic pricing function



Source: Own work, 2021

4.6.1 Specific hedonic models

During researching the literature review it was observed that many author using hedonic pricing method concentrate in their models on these econometric models:

- **Linear model** - is a model, where both dependent and independent variables are in linear form (this model will be used in this bachelor thesis).
- **log – linear model** - is a model where the dependent variable is in form of natural logarithm.
- **Log – log model** - this model includes all variables in a logarithmic form. These models reveal elasticity, meaning, that eventually the researcher will be able to see change in price of real estate, when changing variables by 1 %.

These models made of many factors may face issues related to econometric models one of them may be multicollinearity.

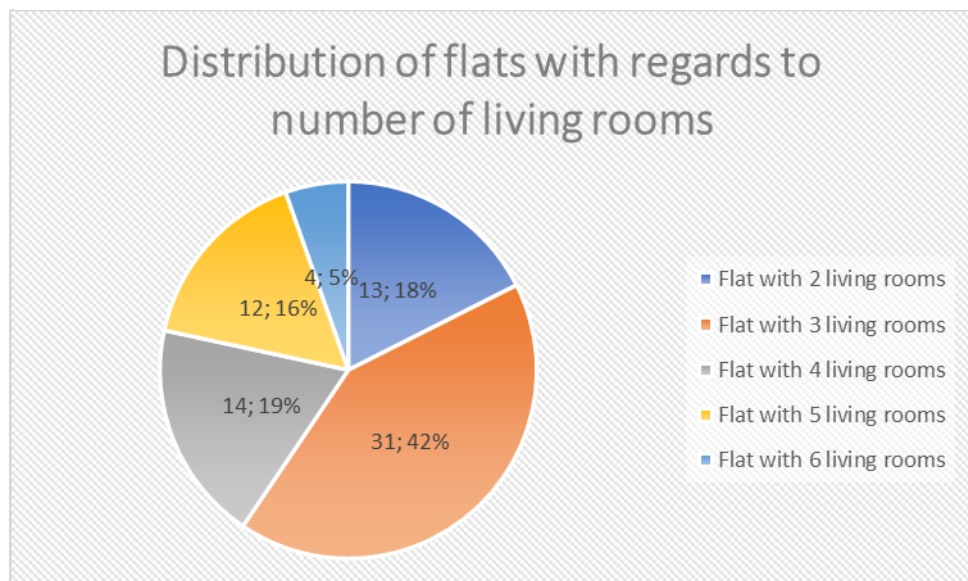
4.6.2 Descriptive statistics about collected data.

The data set includes 74 samples, which were collected to be used in the model. These 74 flats had in average area of 79,6 square meters. Biggest area is in flat with 215 square meters and the smallest in flat with 24 square meters. Median is 65 square meters. Average price of flat was 9 373 987 CZK. The lowest price was 3 246 750 CZK and most expensive flat was for 35 290 000 CZK, median was 4 990 000 CZK. Price for 1square meter was in average: 116 787,7 CZK. minimum price for 1 s.m. was 39 593,91 CZK and maximum 180 974,4 CZK. Average number of rooms in a flat was 3,5. Highest number of rooms in a flat was 6 and lowest 2, median was 3. The age and condition of flats divided samples into two groups 29 old buildings and 45 new buildings. As discussed before, in this thesis will be composition of a real estate divided to groups regarding to its expected impact on price buildings from panels (3 samples) – negative impact the rest of flats are from skeletal structure (8 samples), mixed (18 samples) and bricks (45 samples). Distance from public was measured in walking distance to a station of bus or a tram. Average distance was 103,98 meters, median was 90 meters. The closest range to a public transport was 10 meters and furthest flat was 280 meters from a station. Another distance, which

was considered was distance to Old Town Square, which was set as a city center. In average the distance was 3142,973 meters. The nearest flat was only 2000 meters far and the most distanced flat was 5600 meters from the city center. Median was 2875 meters. The variable most important to this thesis: distance to the street was measured also in meters in air distance and in average the distance was 280, 027 meters. Minimum distance was 1 meter these were flats located straight on the street (11 samples). Furthest flat was 1400 meters far from the street. Median was 127,5 meters.

The following figure (Figure 3) shows distribution of flats divided by number of living rooms.

Figure 3: Distribution of flats with regards to number of living rooms



Source: Own work, 2021

4.6.3 Regression model

To make sure, that there is no correlation among the independent variables. The goal is to have variables with maximum value of correlation (r) in the range between -0,8 and 0,8. The results revealed, that between variables *number of living rooms* and *area in sq. meters* is correlation coefficient equal to 0,815158577, which is very strong correlation, and therefore for further regression model the independent variable “*number of living rooms*” will be excluded.

Table 3: Correlation Matrix

	price for m2	area in square m	n. of living rooms	flat condition	n. of floor	elevator	balcony	distance to the street Plz.	distance to ciyt ycenter	distance to traffic
price for m2	1									
area in square m	0,073665062	1								
n. of living rooms	0,142878501	0,815158577	1							
flat condition	0,221176237	0,204446292	0,185695338	1						
n. of floor	0,018555643	0,057309345	0,078204528	-0,070594107	1					
elevator	0,45616214	-0,055398512	-0,045098762	0,352664966	0,022533147	1				
balcony	0,201144456	0,257655193	0,081649658	0,07244048	-0,027492578	0,071600248	1			
distance to the street Plz.	0,025811916	0,040436612	-0,033137046	0,156493501	-0,226817683	0,0708457	0,059950124	1		
distance to ciyt ycenter	-0,238439016	0,004212739	-0,009969109	0,159365639	-0,202564772	0,041973009	-0,048759814	0,60132686	1	
distance to traffic	0,005734434	0,184264636	0,142269836	0,184805663	-0,149860671	0,076465388	-0,16189241	0,098924237	0,312727038	1

Source: Own work, 2021

For the second correlation matrix the data set was adjusted. Without variable “number of living rooms” the matrix did not reveal any higher correlation, all correlation coefficients were in the required range and therefore there is no other need to adjust the data set.

Table 4: Adjusted Correlation Matrix

	price for m2	area in square m	flat condition	n. of floor	elevator	balcony	e to the str	distance to ciyt ycenter	distamce to traffic
price for m2	1								
area in square m	0,073665062	1							
flat condition	0,221176237	0,204446292	1						
n. of floor	0,018555643	0,057309345	-0,070594107	1					
elevator	0,45616214	-0,055398512	0,352664966	0,022533147	1				
balcony	0,201144456	0,257655193	0,07244048	-0,027492578	0,071600248	1			
distance to the street Plz.	0,025811916	0,040436612	0,156493501	-0,226817683	0,0708457	0,059950124	1		
distance to ciyt ycenter	-0,238439016	0,004212739	0,159365639	-0,202564772	0,041973009	-0,048759814	0,601327	1	
distance to traffic	0,005734434	0,184264636	0,184805663	-0,149860671	0,076465388	-0,16189241	0,098924	0,312727038	1

Source: Own work, 2021

Regression Model

After adjusting the model by removing variable “number of living rooms” was the regression model built. The model without this variable was also attempted to be modified by removing superfluous variables, which were not very much significant, but these changes did not lead to any better result therefore the only adjustment is removing one variable due to high correlation.

Table 5: Regression Model

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,585671114							
R Square	0,343010654							
Adjusted R Square	0,262150426							
Standard Error	20947,54564							
Observations	74							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	8	14891173687	18613967114,242019	0,000386936				
Residual	65	28521978451	438799668,5					
Total	73	43413152138						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	118306,3208	14049,54556	8,42065107	5,23E-12	90247,4408	146365,2008	90247,4408	146365,2008
area in square m	12,38756844	62,60361851	0,1978730420,843762	-112,6404913	137,4156282	-112,6404913	137,4156282	137,4156282
flat condition	3774,132132	5599,830857	0,6739725230,502719	-7409,502354	14957,76662	-7409,502354	14957,76662	14957,76662
n. of floor	-71,14288842	1375,05914	-0,0517380570,958895	-2817,325623	2675,039846	-2817,325623	2675,039846	2675,039846
elevator	25069,43513	6600,396981	3,7981708070,000323	11887,53211	38251,33815	11887,53211	38251,33815	38251,33815
balcony	7669,089768	5887,557757	1,302592702	0,19731	-4089,175017	19427,35455	-4089,175017	19427,35455
distance to the street Plz.	15,85514822	9,387367917	1,6889876230,096014	-2,892720104	34,60301655	-2,892720104	34,60301655	34,60301655
distance to city center	-12,19539603	3,871688847	-3,1498905280,002463	-19,92769259	-4,463099461	-19,92769259	-4,463099461	-19,92769259
distance to traffic	35,91594883	46,34465251	0,7749750380,441165	-56,64071355	128,4726112	-56,64071355	128,4726112	128,4726112

Source: Own work, 2021

The function of econometric model:

$$y = 118306,3208 + 12,38756844x_1 + 3774,132132x_3 - 71,14288842x_4 + 25069,43513x_5 + 7669,089768x_6 + 15,85514822x_7 - 12,19539603x_8 + 35,91594883x_9 + u$$

4.6.4 The Verification of Regression Model

The eventual result of regression analysis will be now subject to economic verification. The verification will be done using knowledge gained during the studies and using knowledge from literature review. The principles and rules from the literature review are necessary to verify the results correctly and explain the behavior of variables. Unfortunately, the attempt to remove superfluous variables to build a better model was not successful and did not lead to any improvements or more accurate model.

Area in square meters – from the results it is clear, that the area of a flat has a positive impact on a price of a real estate, the price of a real estate is increasing by 12,38756844 for one square meter. This trend was expected and with regards to knowledge about real estate it is considered economically verified.

Flat condition – for a flat in a good condition, which was described as a new flat without the need of reconstruction, a potential buyer would have to pay 3774,132132 CZK extra. This result was expected, but anyway some people may prefer lower price for a flat with the opportunity to modify the flat in their own way. However the result from the regression analysis it is clear, that the price of a flat in a worse condition does not differ very much from the price of a flat in a good condition. With regards to the knowledge about real estate this trend can be considered verified.

Number of floors - the horizontal location of a flat represents a negative influencer of a price. The results from regression analysis say that the higher the flat is in the building situated the higher is its price. One floor in a horizontal direction up leads to reducing price by -71,14288842 CZK. The impact of the number of floors was expected to be positive, especially since most of the flats in the data set were flats accessed by elevator. But regarding to the results it turned out, that people eventually choose to have even easier access to their homes in lower floors. In some cases, the view of flat, resulting from the situation in higher floors, will represent an important positive influencer, but in case of data set in this bachelor thesis the potential buyers will prefer to pay less for a flat in higher floors. The result is unexpected, but since the accessibility is an important factor for many people, it is also considered verified.

Elevator – the elevator represents definitively a positive influencer of a price. It brings easier access to flats and its presence in any building will mean benefits for residents. If a flat from the data set is in a building with an elevator its price will increase by 25069,43513 CZK. The utility of an elevator was expected to increase prices of real estate and therefore it is expected economically verified.

Balcony – flat with a balcony will be more expensive by 7669,089768 CZK, which is with regards to knowledge about real estate market trend, that can be considered verified.

Distance to the street Plzeňská – this variable was included in the model to find out if the street, which pollutes the air and causes noise pollution and regarding to literature review it is one of the most polluted streets in Prague, represent a negative influencer. Many

information and measures of pollution were leading to idea of a trend, where the distance from street would increase price of a real estate (the further from the street the more expensive). And the regression analysis confirmed this expectation. If a flat is further from the street it is more expensive. For one meter further from the street potential buyer will pay 15,85514822 CZK. This trend shows that people value their health more than the benefits from living very close to the street, which are for example public transport stations, restaurants, doctor's offices or shops, etc. This trend is considered verified since the trend can be easily explained thanks to knowledge from literature review.

Distance to city center – the regression analysis result says, that the further is the flat located from the city center, the less expensive it will be. For one meter further from the city center the potential buyer will pay less by 12,19539603 CZK. This result is in accordance with expectations based on knowledge about real estate market, therefore it is considered economically verified.

Distance to public transport stations – this variable was expected to have positive impact on price and the result from regression analysis confirmed these expectations. When the distance from public transport station increases, the price of a flat increases as well. One meter distance from the station costs 35,91594883 CZK. This trend is considered economically verified, because it is in accordance with knowledge about real estate market.

The results from the regression analysis did not always meet the expectations, but all of the results can be explained using knowledge about real estate.

5 Results and Discussion

From the collected data set was built a model, which was composed of certain variables, which together as a function determined price of a real estate. The goal was to see composition of variables and their impact on price to see exactly, how certain variables affect the price.

The model made in excel revealed, what the model will look like at first it was necessary to make a correlation matrix, which excluded variable “number of living rooms”, because of its high correlation with variable “area in square meters”. Without this variable the price function model was built. For the easier usage the dependent variable was set to be price for one square meter.

With the results from regression analysis, it was possible to confirm or to reject expectations. The model looks like this:

When the area of a flat increases, the price increases as well 1 square meter increasement leads to **increasement** in price by 12,38756844 CZK. The good condition of flat means, that the price will **increase** by 3774,132132 CZK. It was found out, that if a flat is in higher floor then the price will **reduce** by 71,14288842 CZK by each floor in the upward direction. When a flat is in a building with an elevator, then the price will **increase** by 25069,43513 CZK. The price of flats equipped with balcony will also **increase** by 7669,089768Ck. The variables which are based on location resulted in **increasement** od price by 15,85514822 CZK for one meter away from the street Plzeňská. If the distance from city center gets higher than the price **decreases**, one meter further from the city center means that the price will reduce by 12,19539603 CZK. Last variable measured distance to public transport station and the model says, that one meter away from the station **increases** the price by 35,91594883 CZK.

All the results from regression analysis can be explained and together with knowledge about real estate market these results make sense and can be considered economically verified.

6 Conclusion

The goal of this bachelor thesis was to find out if the street Plzeňská represents a variable, which negatively influences price of real estate situated closely to it. To understand the problematics from this field were at the beginning explained most important terms, rules, and principles from real estate market. The knowledge which this thesis brought also explained, how important for many people the investment to real estate is, and for how long these decisions influence their lives. It is certain, that one of the most basic human needs: “having place to live” is for most people extremely committing decision, which should be a subject to a consideration and the decision whether to buy or not a real estate must be considered correctly. The same considerations and complex thinking are also for those, who are on the other side and they are offering their real estate for sale, they should also know the value of their property. For everyone it is necessary to know the value of real estate to avoid being subject to any kind of fraud or making any bad investment.

This bachelor thesis aimed concretely on district Prague 5 and the flats surrounding street Plzeňská. All the studied flats were characterized by given variables, which using regression analysis determined price of a real estate.

The most important and most watched was variable measuring air distance in meters to the street Plzeňská. This distance was supposed to tell if people demand living very close to the street in exchange for suffering from noise pollution and huge air pollution. The demand for living close to street could be also explained, because the street offers public transport stations, doctor’s offices, restaurant, shops, etc. But the regression analysis showed that people will rather pay more for a flat, which is further from the street. This expectation was at first supported by literature review. The research about, how much is the street polluted told, that street Plzeňská is one of the most polluted streets in Prague, this fact only supported the expectations.

In this bachelor thesis it was discovered that real estate located closely to street Plzeňská in Prague 5 are cheaper, than flats further from the street. This result may be used as an advice for someone willing to invest into real estate market, because it was found out, that people are not willing to live close to the polluting street on the other hand the

direction of today world is to seek for “greener” tomorrows, which may mean, that one day the street will not be pollutant, because the traffic will no longer be running on combustion engines, which are polluting mostly air, but also making huge noise. In Czech Republic there is no set date for this extremely expensive fleet replacement, but for example The Great Britain already set a deadline for selling cars using diesel or gasoline engines on a year 2030 (idnes.cz, 2020). Imagining same deadline for Czech Republic, which would push people to use ecological and less noisy cars it can be estimated, that the price of the real estate suffering from pollution now, will increase in future. Therefore it may be considered as a good investment, in location, which in close future will no longer represent negative factor in price making. Anyway these forecasts may not ever occur. The pandemic, which began at the beginning in 2020 showed, how unpredictable situations may occur. No country on earth was prepared to fight it, and no country has yet recovered from these terrible times, and no – one knows, when the world will return to condition before the pandemic. With regards to this bachelor thesis we can say, that until now the real estate market have not suffered very much, remained stable, and predictions by experts are positive on the other hand it is easy to imagine, that people living in rented real estate can use their bargaining power to push the prices of real estate down.

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