

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



Bachelor Thesis

**Evaluation of Economic Development in a Selected
Region**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Jiří Kračman

Economics and Management

Thesis title

Evaluation of Economic Development in a Selected Region

Objectives of thesis

The goal of the thesis is to evaluate the economic development of Ústecký region, identify the causes of problems, predict future development and suggest solutions and improvements.

Methodology

My primary sources are going to be the Czech statistical office, Eurostat and researches conducted by organisations and universities regarding socio-economic circumstances of my region. I will use this data to highlight macroeconomic tendencies and also the causes behind certain developments in the region. My secondary sources will be specialised literature and trustworthy sources from the internet.

The proposed extent of the thesis

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Economic development, GDP, Mining Industry, Unemployment, Macroeconomic Indicators, Urbanization

Recommended information sources

BARTÁK, Miroslav. Ekonomické a sociální determinanty zdraví v Ústeckém kraji a Sasku. Praha: Wolters Kluwer, 2013. ISBN 978-80-7478-418-7.

HRADECKÝ, Tomáš. "Nejpokrokovější kraj v Československu": Krajský národní výbor Ústeckého kraje v letech 1949-1960. Praha: NLN, Nakladatelství Lidové noviny, 2017. ISBN 978-80-7422-624-3.

<https://www.czso.cz/csu/xu/ekonomicky-vyvoj-v-usteckem-kraji-v-roce-2020>

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WOKOUN, R. *Základy regionálních věd a veřejné správy*. Plzeň: Vydavatelství a nakladatelství Aleš Čeněk, 2011. ISBN 978-80-7380-304-9.

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Declaration

I declare that I have worked on my bachelor thesis titled "Name of the bachelor thesis" 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 date of submission

15.3.2021

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Evaluation of Economic Development in Ústí Region

Abstract

The aim of this study is to analyse and evaluate the economic development of a chosen region (in this case the Ústí Region). It will be achieved by collecting available data from internet sources like different studies and the Czech statistical office as well as scientific publications. This data will then be evaluated and analysed by the scope of macroeconomics and dissected with statistical methods. I am going to look into historic development and the implications of historic events and regimes on the region, especially throughout the 20th century as well as the current direction and future predictions and recommendations. The region has a rich history, which immensely shaped its current social and economic state. The project will outline the importance of the region's structure and also its natural resources, which have been critical for its economy considering the prevalence of the mining industry. There are also important socio-economic aspects, such as ethnicity, level of education, level of unemployment, number of people in debt and other issues.

Keywords:

Economic development, GDP, Mining Industry, Unemployment, Macroeconomic Indicators, Urbanization, Regionalization, Regional policy, Public administration,

Title of Bachelor Thesis in Czech

Abstrakt

Cílem této práce je zanalyzovat a zhodnotit ekonomický vývoj vybraného regionu (v tomto případě se jedná o Ústecký Kraj). Data a informace budou sbírána z vědeckých publikací, akademických zdrojů a pro praktickou část z českého statistického úřadu. Tato data budou zhodnocena z hlediska makroekonomie a rozebrána statistickými metodami. Nahlédnu do historického vývoje a vlivu historických událostí na současnou situaci kraje, obzvlášť pokud jde o události dvacátého století. To se budu snažit dát do současných souvislostí a předpovědět budoucí vývoj. Ústecký kraj má bohatou historii, která měla velký vliv na současné dění. Tento projekt se zaměří na důležitost struktury regionu a jeho přírodního bohatství, které bylo historicky velmi zásadní vzhledem k převaze hornictví v místním hospodářství. Také se vezmou v potaz demografické prvky, jako sociální vyloučené skupiny, vzdělání, nezaměstnanost, insolvence a podobné jevy.

Klíčová slova: Hospodářský vývoj, HDP, Hornictví, Nezaměstnanost, Makroekonomika, Urbanizace, Regionální správa, Veřejná správa, Regionalizace

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List of Abbreviations

EU – European Union

CZSO – Czech statistical office

GDP – Gross domestic product

C – Consumption

I – Investments

G – Government spending

NX – Net Exports

CZK – Czech crowns

1 Introduction

The topic of this thesis is the Evaluation of economic development in the Ústí region. That is a complex topic with many historical aspects to it. It used to be a very important and economically prosperous part of Czechia, but there has been a steady decline after the second world war and this study is going to look into the reasons for that. There are many underlying issues present in the region that are constantly the points of debate at both regional and national level. It is an important topic to talk about, since the quality of life for a lot of residents in that area is lower than optimal and the solution is a very complex issue. There are efforts at both regional and national level to improve the situation and there is also help from the European Union, but that is mostly funding focused on ecological development, since that is an immense issue for the Ústí region as well considering the prevalence of mining and various industrial complexes. There is a lot of chemical industry.

The current problems are unemployment, insufficient educational infrastructure, high birth rate in the socially weaker groups and subsequently high mortality rate. It is the second worst region in regards to quality of life, which leads to significant decline of population. That presents an even bigger problem, since the people who move out are those more educated and economically active and those who stay usually belong to socially and economically weaker groups. These facts very negatively affect the overall state of the region and it is going to be crucial to solve them or mitigate te impacts to a certain degree in order to improve the situation.

I selected this topic, because a part of my family lives in the region and they're affected by the state of the infrastructure, ecological factors and economic opportunities such as available businesses, power suppliers etc. I also think it's interesting to delve into these issues, because I feel like these regions are being neglected and the people who are struggling with their quality of life are in need of help on the national level.

2 Objectives and Methodology

2.1 Objectives

The goal of the thesis is to evaluate the economic development of the Ústí region, identify the causes of problems, predict future development and suggest solutions and improvements. The first part will focus on the definition of a region, how it fits into the context of the Czech republic and neighbouring states(especially Germany) and how it has historically developed regarding its population, quality of life, economic level, industry and other important factors. The second part is an analysis of the development in a more detailed and statistical manner, that will provide relevant output for the future development and it will conclude in a secondary data will be used.

2.2 Methodology

The theoretical part is conducted by using literal sources and information written by academical researchers and institutions like the statistical office. The foundation for the research will be laid down by defining key concepts like Regional politics, definitions of our selected region and the region we're studying itself.

For the practical part, data is collected mainly from the Czech statistical office and using statistical methods specifically linear regression models and time series analysis with forecasting for the future.

3 Theoretical foundation

3.1 Definition of a region

The term “region” is yet to be exactly defined by researchers in the field, but we can assume a definition for the purposes of this study. Region can be defined from a geographical point of view, which means in essence, dividing the earth into areas based on their natural features. This definition sets the regions apart based on certain characteristics that are different from other areas. I am going to work with a different definition and that is an arbitrary one, designed by humans to divide land. This definition is based on political and economic foundations and the purpose lies in better political administration. It was set up this way to differentiate between space, that is governed autonomously. (WOKOUN, MATES, KOUDELKOVÁ, 2011, str. 84-88)

3.1.1 Regions in the czech republic

The Czech Republic is, according to the constitution, divided into 14 regions¹ and the Ústí region is one of them. They are further divided into Municipalities². Each region has its own right to govern itself with the state being allowed to interfere only in circumstances set by the law. Each region and municipality have their own budget and income, which is determined by the law. They use the budget according to the law and they are obligated to ensure an all-around development of its space and the population. They also present themselves in legal relationships and carry the related responsibilities. (RISY,2021)

The regions are also divided into districts, but as of 2003, the districts no longer have their own office and are only kept as a statistical unit. They are used in archives and documents as well as a way to differentiate municipalities with the same name. They are used for example by the statistical office, or the job office, when they create statistics. (KOUDELKA,2003)

¹ Kraje

² Obce

3.1.2 General information about the Czech Economy

The Czech Republic is a landlocked country located in central Europe. It has 4 neighbouring countries: Germany to the west, Poland to the northeast, Austria to the South and Slovakia to the east. Czech Republic and Slovakia used to be a one country called Czechoslovakia.

It is a developed country, that relies heavily on exports. Top 10 export articles are (WORLDOFEXPORTS.COM, 2022):

- 1) Mineral fuels including oil: US\$5.2 billion (2.3% of total exports)
- 2) Iron, steel: \$5.9 billion (2.6%)
- 3) Plastics, plastic articles: \$8.5 billion (3.8%)
- 4) Articles of iron or steel: \$7.9 billion (3.5%)
- 5) Optical, technical, medical apparatus: \$4.8 billion (2.1%)
- 6) Toys, games: \$4.5 billion (2%)
- 7) Furniture, bedding, lighting, signs, prefabricated buildings: \$5.8 billion (2.6%)
- 8) Vehicles: \$40.9 billion (18.1%)
- 9) Machinery including computers: \$42.9 billion (19%)
- 10) Electrical machinery, equipment: \$41.4 billion (18.3%)

Czech Republic has a very good location for trade, since it is in the heart of Europe and has it is a good hub for trade and transportation. There are many roads and highways connecting the neighbouring countries. This factor and the general openness to business is why many investors like this destination, since it grants them great access to many markets.

The development was greatly influenced by the events of 20th century, since during the war, Czechia was occupied by the Germans and after the war in 1948 a totalitarian criminal regime was established by the Soviet Union. During that time, the economy was mainly industrialized (even the agriculture), which provided us with one of the highest living standards amongst countries of the Soviet bloc. Despite that, it stagnated compared to western countries, as the government was unable to organize work effectively and make stable profits.

The economy was centrally planned, which means the Soviet government decided what, when and for how much is produced. This was planned mainly based on demand and deficiencies in certain regions. Due to this fact and companies not being able to focus on maximizing profits, the economic growth has been halted immensely. You can see the GDP comparison here (HARDT, KAUFMAN, 1995, pg.17):

Table 1 GDP historical comparison

GDP per Capita(1990 USD)	1938	1990
Austria	1,800\$	19,200\$
Czechoslovakia	1,800\$	3,100\$
Finland	1,800\$	26,100\$
Italy	1,800\$	16,800\$

As you can see, Czechoslovakias GDP increase has been absolutely minimal following the 2nd world war compared to developed western countries. During the 70s and 80s, the soviet countries, including Czechoslovakia didn't develop technologically at all and a lot of resources were depleted and environment damaged as a result of extensive industrial work. (HARDT, KAUFMAN, 1995, pg.16).

Following the revolution in 1989, the country shifted towards a market economy, which focused on maximizing profits, instead of satisfying demands of the Soviet Union. This brought several challenges, since a lot of businesses ceased to exist and many people lost their job, which led to a decrease in GDP among 1990-94, but it bounced back. Important factors in this process were:

- Price liberalization³
- Privatization of government businesses
- Allowing private entrepreneurship
- Creating a banking system
- Opening up to foreign markets

Czech Republic is now one of the most prosperous central European countries with a strong economy and many foreign investments. (EKONOMICKYDENI.CZ,2015)

³ Firms could set their own prices now and supply and demand could start evening out

3.1.3 Ústí Region Geography

The Ústí region is located in the northwest side of the Czech Republic, it neighbours Germany as well as 4 other Czech regions. From a geographic point of view, the region is very heterogeneous as it contains a large amount of diverse nature. On the north side, which is close to the German border, there are the Ore mountains and Lužice mountains. On the south side, we can find a very level terrain, which includes the most famous czech mountain: Říp. There is also the lowest point of the Czech Republic (115 m.) One of the longest rivers in Europe, Labe goes through the Ústí region and continues to Germany as well. (CZSO)

The region lies on 5 339 km² of land, which makes up 6,8% of the Czech republic. Almost 52% of this land is used for agricultural purposes. 31% is made up by forests and 2% is covered by water. It's very diverse in terms of both natural and economical structure. Some parts are very densely populated, while others, especially up north are less dense in population. The most important economical aspect of the region has historically been its mineral deposits. There was a wide spread deposit of coal very shallow under the surface, which made it lucrative to dig there. The region is very diverse and can be divided into several parts according to its primary economical focus. A part called Podkrušnohoří (Chomutov, Most, Teplice, Ústí nad Labem) is mainly industrial a there is a lot of factories. Among these are electricity plants, coal mines, chemical factories and glass factories. On the other hand, the southern part of the region (Polabí, Litoměřice, Louny) is rich in agriculture and especially its hops and vegetables production. (CZSO)

3.1.4 History of the Ústí region

Now the first signs of habitation begin in the stone age, then in the Neolithic times farmers settled around the Labe and Ohře rivers. After that there was many year of different tribes going through the region and around the 10th century, some areas started becoming significant centres of the Czech kingdom. In the following year, strict religious and feudal systems were put in place by several aristocratic families. Then in the 13. Century some of the cities like Ústí nad Labem and Litoměřice became significant centers in the kingdom. Then followed the Husit wars, some of the battles took place in the region and some of the Husit settlements were there. After that Litoměřice started to become the most significant

city in north Czechia. During the 30 year war the region suffered a lot of damage, protestant churches were burned down and the process of recatholicization took place. The region was under strong religious and political oppression for the next century. Despite that, the region was developing quite successfully, which was slowed down by the Austrian was in the 18th century. (KR.USTECKY.CZ, 2004)

When serfdom(nevolnictví) was abolished, the region started to quickly develop very strong industrial infrastructure. The region was occupied mainly by a labor force and they learned how to strike early in the 19th century. Before the 2nd world war the region was seceded and attached to Germany. Now after the 2nd world war comes probably the most significant period in Ústí regions history. The German population was displaced and some portion of it even murdered in several massacres. The region was then populated by Romany people. A lot of people moved out of the region after the year 1945 and cities started vanishing because of extensive mining and industrial activity. (KR.USTECKY.CZ, 2004)

After the year 1968 the government started placing even more Romany population into the region and in the 80s they even hindered attempts to migrate to other regions. At this point the region was in a horrendous state, because there was no attempt to develop and increase the quality of life. Following the year 1989, there were Ecological programs and foreign investments meant to reduce air and water pollution, those attempts were quite successful. Thanks to the restructuring of big factories, which were a hallmark of the communist policy a lot of poeple lost their job and unemployment began to rise significantly and agriculture has also fallen greatly. (KR.USTECKY.CZ, 2004)

3.2 Regional Development theories

There are several theories regarding regional development, which are crucial for the disciplines of regional economics, economic geography and economic growth. Economic development isn't a static metric, but it varies greatly as we have to take into consideration many factors affecting the regions such as richness in natural minerals, socioeconomic variance, density of the population, level of education, investments, available capital, technological infrastructure and so forth. For the sake of these theories, regions are considered a sub-unit of a country and is characterized by a level of spatial diversity.

3.2.1 Location theory

Location is one of the most crucial indicators of welfare in a region. Location theory is derived from microeconomics and it tries to explain how to optimize the location of an economic activity, such as running a business. It is concerned with the question of why firms choose to locate in certain places rather than others, and how their decisions affect the economy as a whole. Location theory assumes that firms aim to minimize their costs and maximize their profits, and that their decisions are influenced by factors such as transportation costs, market access, availability and quality of labour, and local economies. By analysing these factors and their interactions, location theory determines how the economic activity is distributed in space and how government policy and intervention affects the location of the activity. For example, it analyses how firms choose the location of their activity based on the spaces characteristics and policies regarding the specific place. There are several models for location theory, that I Will describe now. (JONES, WOODS, 2002)

3.2.2 The von Thünen Theory

Johan Heinrich Von Thünen was an economist and a farmer. That means his model was based on agricultural presumptions. According to his model, the farmers would choose how to conduct their activity like choosing which plants to grow and which livestock to breed. The model assumes, that there is a centre of an area, where the market is located and business is conducted there. Which is why it's advantageous to be closer to it, because of lower transportation costs. He divided the region into rings around the centre with each one being further. The faster the crops need to be transported (for example strawberries and other fruits), the close they need to be to the market. On the other hand, the outer rings can be used for activities, that don't require such fast transportation such as growing wheat, livestock and even hunting. It's an early concept, that oversimplifies the intricacies of location choice and ignores other important factors such as topography and soil quality, but it laid out the foundation for further development. People started thinking about spatial components of economic activity thanks to this theory. (JONES, WOODS, 2002)

3.2.3 Weber's Theory of Location

In the early 20th century, a German economist Alfred Weber came up with his own theory. It was based on the presumption, that the primary aspect of location choice for firms was cost minimization. That includes transportational, labour and material costs. This theory was rather focus on manufacturing than agriculture. It states for example that certain processes choose to locate near sources of raw materials. These businesses include timber processing facilities, electrical plants needing coal etc. On the other hand a technological firm might want to relocate near a university with technical focus. It takes into consideration labor costs as well, we can see this phenomenon first hand, most current retailers, who produce something on a mass scale. Fashion firms and phone makers for example use mostly labour force in third world countries, because it's so cheap. Another important factor of this theory is agglomeration. This variable takes into account how a certain area provides marketing or producing cost minimization opportunities. Companies can be attracted to a certain area, especially if it's heavily urbanized or industrialized, or there's a lot of investments in infrastructure and development. For example, tech firms like to locate in California, because there is a large communication network and infrastructure and also a very good pool of workers. (JONES, WOODS, 2002)

3.2.4 Neoclassical theories

Neoclassical economic theories emerged in the late 19th century as a response to the insufficiencies of the classical theories. It's based on the idea, that individuals and firms base their decision making on rational reasons and calculate the costs and benefits of every move. In practice, that means every subject on the market tries to minimize costs and maximize profits. It emphasizes the value of market equilibrium and assumes that the actors on the market are attempting to reach the point of equilibrium. They assume, that there is perfect competition and everyone has access to perfect information. It also emphasizes the concept of comparative advantage, which means some subjects have better conditions to produce a good or service than others. Therefore they can get more profit by specialising.

When it comes to regional economics, neoclassical theories say, that the most important determinants of regional growth are production factor availability and productivity. They assume, that factors like free trade, technological progress and equilibrium lead to convergence of growth among regions.

3.2.5 Borts and Stein model

This is a model of regional development that works with the assumption, that firms try to maximize profits by maximizing the difference between revenue and costs. It also assumes, that the market is perfectly competitive and there is perfect information available. It says, that regional long-run growth is determined by capital stock, labour quality and quantity, productivity and technical progress. Technical progress is driven by non-economic influences. Labour and capital are mobile among regions, therefore outside investments and migration are the most important factors for regional growth. It is used to analyse the effects of government policies or shifts in market conditions on firms and markets.(S.Sousa,2010)

3.2.6 Factor Price Equalization theory

This theory again presumes perfect competition and information, also perfect mobility of factors across regions. It suggests, that in a perfectly global economy, the prices of factors of production will equalize overtime by natural development and that is the main driving force behind regional development. It says, that richer regions invest in the poorer ones, because of cheaper factors of production. Therefore money is flowing into the lagging regions and the competition for factors is increasing. This in result leads to increased competition for the factors and therefore increased cost, which results in the costs of factors of production and returns on investment equalizing.

3.3 Essential Economic Indicators

3.3.1 Labour Market

In order to understand employment rate and how it affects the regions economy, it's necessary to understand how the labour market operate, its economical functions and how supply and demand interact. The labour market is defined by the demand for work and supply of labour. There is competition on both sides, which means there is many firms and institutions demanding labour and also many people offering it. The offer on the market is represented by a sum of all job offers and the supply is represented by the demand of every subject in the market.(HOLMAN, 2008, pg. 142)

The labour market is heading towards equilibrium and stays in it the same way as the product market. Imbalance in the labour market is defined as surplus of labour supply, which results in unemployment and as a deficit of labour offer, which is a temporary situation, that is caused by either the unwillingness to work, or just unattractive job offers overall.(HOLMAN, 2008, pg. 142)

The main indicators of supply in the Labour market are:

(DVOŘÁKOVÁ, 2007, pg. 67)

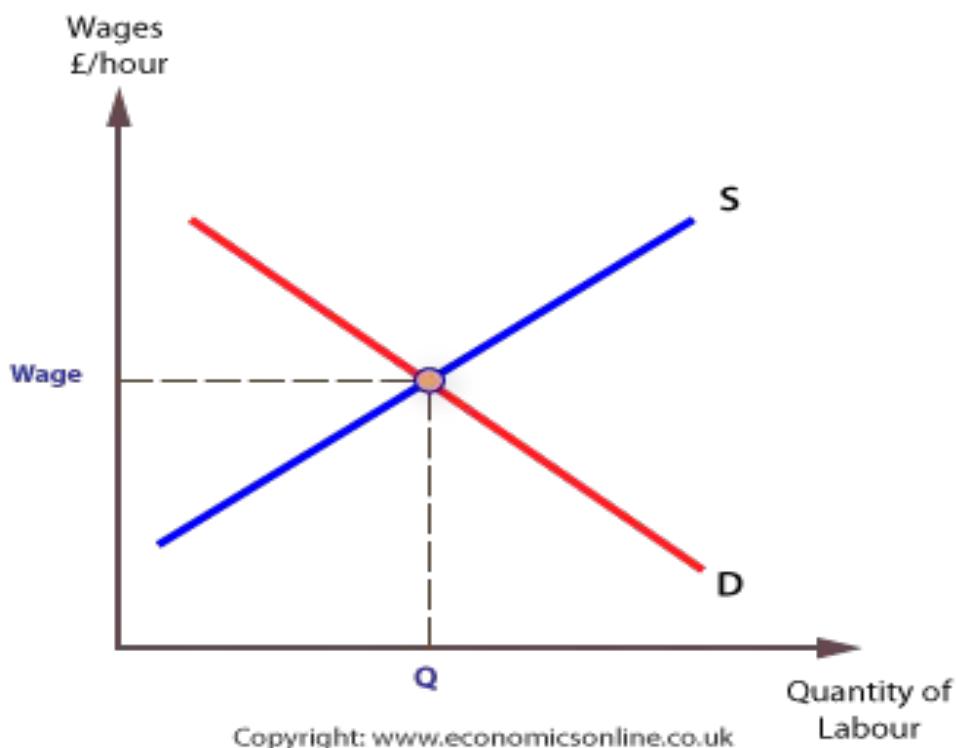
- Real wages, their current level and forecasted development
- Disparities among households and economic classes
- Any income, that doesn't come for working(for example welfare checks)
- Demographic factors, stratification of the population by gender and age
- Overall level of economic development and activity in the population
- Culture, tradition and work habits

Main indicators of the demand side of the Labour market

(DVOŘÁKOVÁ , 2007, pg. 67):

- Cost of labour, level of real wage
- Demand for goods and services and their price
- Workforce productivity
- Factors of production cost
- Projected future revenue
- Available workforce on the labour market

Labour can be considered a factor of production, that is traded on the labour market. The supply and demand for labour works in the same way as it would for any other market(eg. Goods and services). Despite this fact, labour is different in some aspects, one of the most important facts is, that almost every person can provide labour and the most important factor in the market is wage. There are 3 players on the labour market: government, employers and employees. The employees are supplying labour in exchange for wage. The higher the wage is, the bigger the supply from employees. The employers(firms) are on the other hand demanding the labour and they decide how many workers they'll hire. They are motivated by profit maximization and costs minimization, which is more relevant in this case. Therefore, when the labour is cheap, they demand more labour and vice-versa. The government acts as an outside influence, that regulates the market to ensure its integrity and fairness. It uses several tools: setting the minimum wage, environmental regulations, unemployment support and many other. (LIPOVSKÁ, 2017)



Graph 1 Labour market equilibrium

We can see, that the graph is identical to regular market equilibrium graph, just with different factors on the axis. It is defined by wage and labour and lines signifying supply and demand.

The point of equilibrium is in the middle and when the market reaches this point it means, that there is perfect balance. In an equilibrium, supply meets the demand and there is nor surplus or deficiency on either side. There is also a wage, that cannot be considered cheap or expensive, but it's balanced. (ECONOMICSONLINE.CO.UK)

3.3.2 Unemployment

Unemployment is one of the most significant socio-economic problems in today's world. It is a phenomenon, that occurs when the supply of labour is greater than the demand for it. It is mostly caused by imbalance between the equilibrium price and market price of labour. When the wages exceed the equilibrium. This situation occurs, because nominal wages are not flexible, but fixed and cannot really be changed downwards. Even contrary to that, they should only be gradually increasing because of inflation. There are also trade unions and laws that make lowering of wages completely impossible. (HŘEBÍK, 2013, pg. 183)

Unemployment can be measured and classified in different ways. Households can be distinguished into economically active and inactive. An economically active individual is one, that can be considered a supplier on the labour market, while an economically inactive individual doesn't participate in the labour market at all. This group is considered unemployed and the reasons for them not being economically active vary greatly. Some of them are generally understood in society and supported by law (seniors, children, mothers), while others come solely from the individual's motivation. That can be an unwillingness to work, having an income that doesn't require work (renting property). The first group is usually compensated by the state, because they either worked their whole life, or will work in the future, so it can be considered an investment on the government's part. (HŘEBÍK, 2013, pg. 184)

There is a natural level of unemployment, which occurs when the economy reaches its potential product. That happens when the growth of employed individuals matches the growth of unemployed individuals.

Unemployment is classified into many categories, but these are the 4 most commonly used (HŘEBÍK, 2013, pg. 184-185):

1. Frictional – This is the most common type, which is used in neoclassical macroeconomic models. It assumes a fluctuation among workers with similar qualification. For example, when one firm is suffering economic losses and has to lay off some of its employees, they are temporarily unemployed, while searching for another position. This process occurs in every functional modern economy.
2. Structural – This type of unemployment is more complex and harder to solve. It is caused by structural deficits in the economy, mostly due to production being too one-dimensional. This is very common in the Ústí region as when the mining industry was developing there, thousands of workers moved into the region for work and they have been laid off, because the coal mining is diminishing over the years for various reasons. The solution to this problem is mostly re-education and requalification of the workers in order for them to be useful in other fields.
3. Seasonal – This type of unemployment is caused by periodical shifts in the economies focus, for example in areas with a lot of summer tourism, there might be increased unemployment in the winter, when business is slower.
4. Cyclical – Follows the economic cycle. In the period of recession, when there is a crisis, firms have to cease their activities and people lose jobs. On the other hand, when the economy is bouncing back, the unemployment rate goes down. This type of unemployment is tied to GDP, so it can only be affected on the level of the whole economy.

Consequences of unemployment are both economic and social. Economic consequences are mainly a loss of productivity as the economy doesn't fully use its potential and everyone in the region is losing money. Social consequences are mainly increased stress and worsened mental health. Long-term unemployment can lead to depression, alcoholism, Gambling and drug addictions and even suicide in extreme cases. (HŘEBÍK, 2013, Pg. 185)

3.3.3 GDP

Gross domestic product is a metric used to evaluate the performance of the examined economy. The definition is following: GDP is the monetary value of all goods and services produced within a country, or a selected region, typically per year. It takes into account the market price of everything produced in the area. It is usually calculated as GDP per capita when comparing different countries and regions, as they differ in size and population structure. Although being a very popular and quite fitting indicator, GDP isn't the sole unit, that measure the economic performance, because it doesn't take into account factors such as Income inequality and distribution of wealth, environmental impact and quality of life. (Hřebík, 2013, pg. 145-147)

There are three main approaches to calculating GDP:

1. The expenditure method: This method calculates GDP by adding up the alle expenditures made by subjects operating on the regions market. It adds up the following components:
 - Household consumption
 - Real investments: Money, that firms invest in building capital (machinery, inventory, buildings)
 - Government spending
 - Net exports

Formula for calculating GDP using this method: $GDP = C^4 + I^5 + G^6 + NX^7$

The graph bellow illustrates how the Czech economy looked like form the point of this method. **Red part=C, Black= I, Blue=G, Green= NX**

⁴ Consumption

⁵ Investment

⁶ Government Spending

⁷ Net Export

Struktura HDP (2019)



Graph 2 GDP structure

Source: Kurzy.cz, 2020

2. The Production method: This method is based on the theory of added value. It sums up the added value of everything produced in the country during a certain time period. Value added is the difference between the price of the output and cost of the input in the production process. This value is calculated for each industry, and for each step in a product cycle. It takes into account the value added from the first actor, that initiates the process: Fisherman for example, all the way through transportation provides and finally retail shops. (HŘEBÍK, 2013, pg. 149-150)

Formula: **Gross value of output – Value of intermediate consumption**

3. The income method: This method is calculated as the sum of incomes, that is made by both employees and the owner of the factors of production. There need to be some distinction about these incomes regarding taxes and interest.

Formula: **GDP= Total national income + Depreciation + Sales Tax + Net Foreign Factor income**

GDP is further divided into nominal and real. The nominal value is assigned using current market prices. The real value uses prices adjusted to inflation. Real GDP is calculated by choosing a starting point (a year in the past) and adjusting the values accordingly. (HŘEBÍK, 2013, pg. 150)

GDP is also used to calculate an important metric, which is Workforce productivity. That is calculated by dividing GDP by the amount of employed individuals. It can also be

measured by using the hours of work done (how much value is produced by an hour of work). It can be also taken into account when calculating Gross value added per hour of work. (ČT24, 2019)

3.3.4 Inflation

Inflation is another important phenomenon, that impacts whole nations. It refers to a consistent increase in price level of goods and services in an economy. As a consequence of prices rising, the purchasing power and therefore, the value of money goes down. There are multiple ways to measure inflation, they are called price indexes. There are 2 basic types:

- 1) **Price deflator (Paasche index):** This index consists of real and nominal GDP. The deflator is calculated by dividing the nominal GDP by real GDP, which is then multiplied by 100, because it's in percentage. This is what the formula looks like:

$$\text{DEF}_{\text{GDP}} = \frac{\text{GDP}_{\text{NOM}}}{\text{GDP}_{\text{REAL}}} \times 100$$

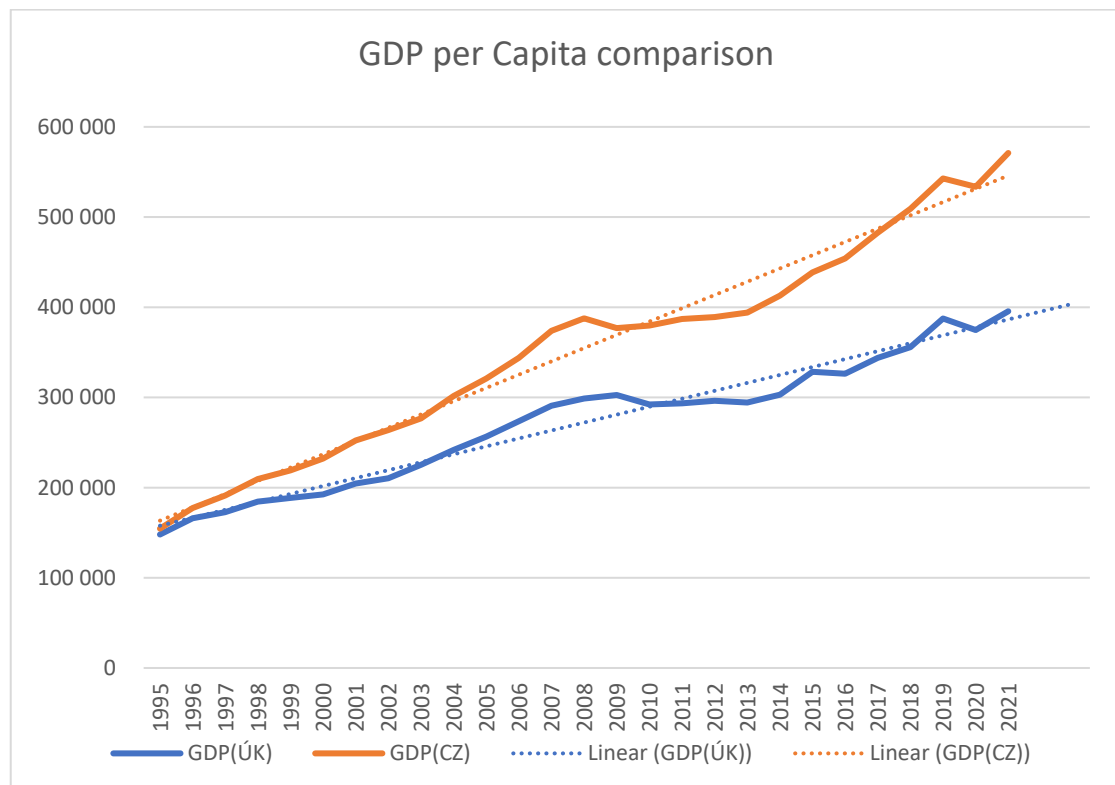
- 2) **Consumer price index (Laspeyeres index):** This method is related to household consumption. It reflects the price of products most commonly bought by the average consumer. It doesn't consider the production of the whole economy, but economists built a so-called consumer basket. This is a collection of goods bought by the average household. The formula looks like this:

$$\text{CPI} = \frac{\text{Value of the consumer basket in the calculated year}}{\text{Value of the consumer basket in the base year}} \times 100$$

4 Practical Part

4.1 GDP

Now when it comes to GDP, we'll look at how it evolved since the year 1998 and how it compares to the Czech Republic as a whole and also to neighbouring regions. Using statistical methods to forecast and also find correlation among other indicators. Let's look at some statistics regarding the GDP data for Ústí Region and the Czech Republic as a whole.

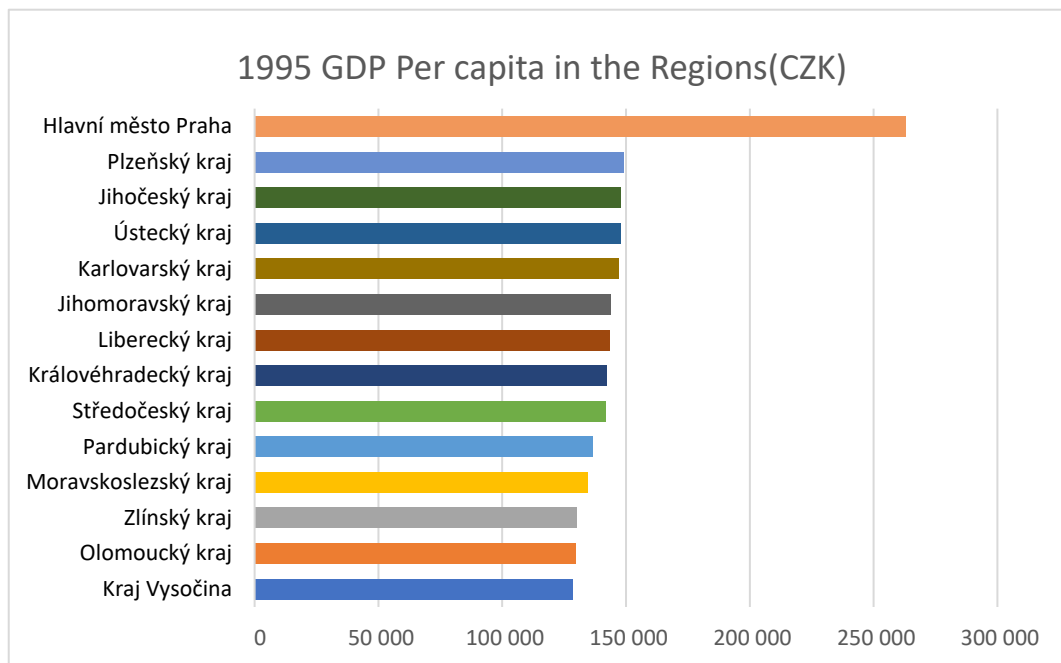


Graph 3 GDP per capita comparison

(CZSO,2022) (Own Graph)

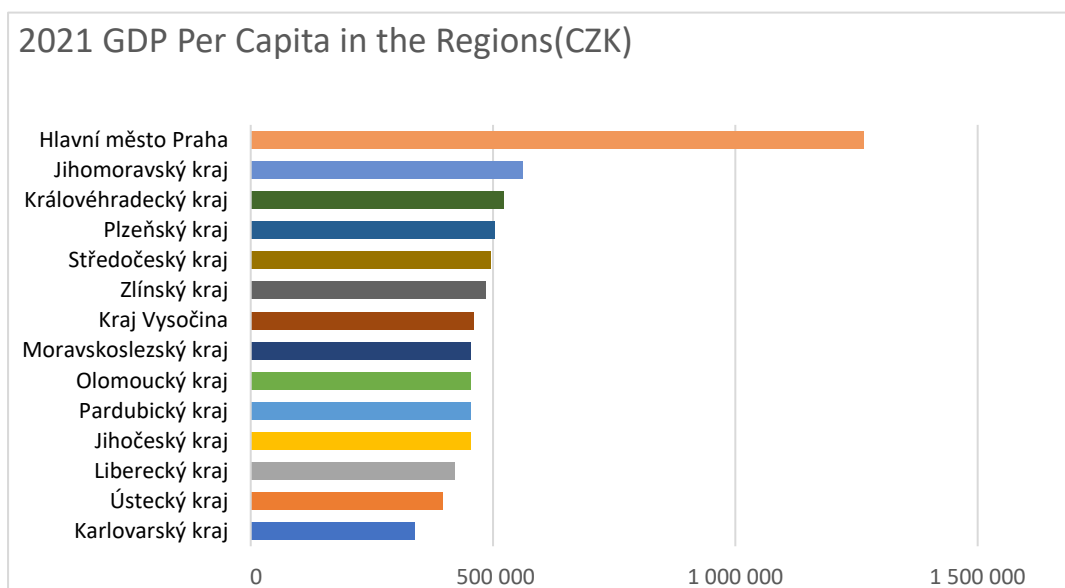
Now when we look at the graph, we can see that in the year 1995, the GDP per capita of Ústí region was identical with the GDP of the whole country. But later on, we observe a very different trend with the national average trendline increasing a lot more than the regional one. When we look at the development of mining and industry, we can see a definite reason for that. In the 90s, the whole country was transitioning from centrally planned to market

economy. In result of that, many mines and steel factories were closed and unemployment rose rapidly. There is also a decrease on both lines between the year 2008 and 2009, that was caused by the global financial crisis. Production and exports in the whole country have stagnated during this time period, but the government later intervened with subsidies, which stabilised the regions economic decline. Here we can see the GDP comparison between Ústí region and all the other Czech regions between now and then.



Graph 4 1995 GDP per capita in the Regions

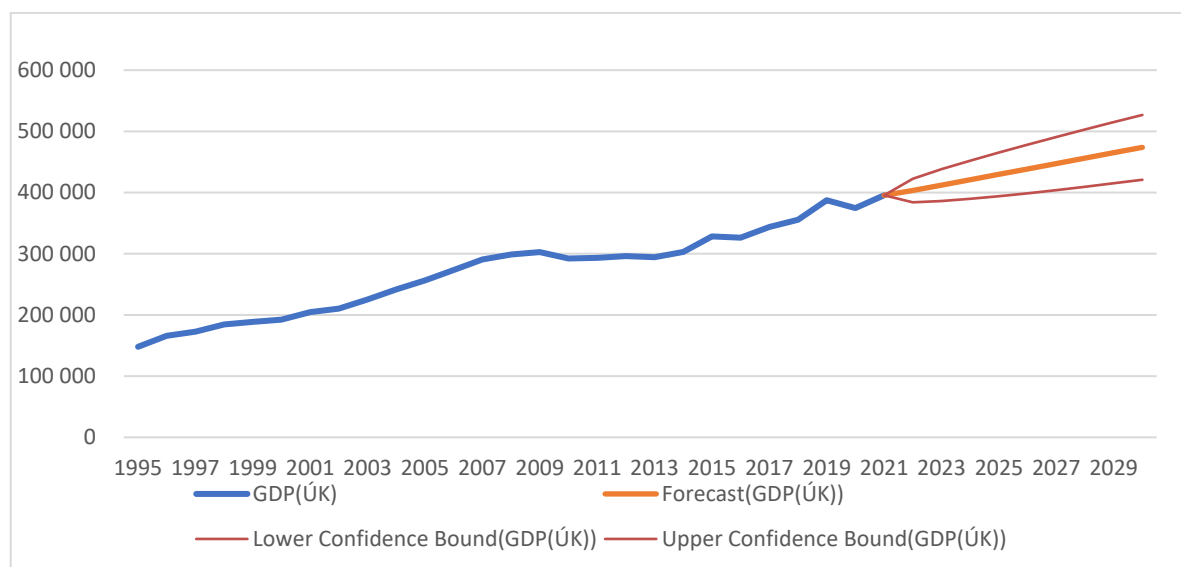
(CZSO,2022) (Own Graph)



Graph 5 2021 GDP per capita in the Regions

(CZSO,2022) (Own Graph)

As we can see, Ústí region had the 4th highest GDP among the Czech regions and in the year 2021 it was in the 13th place. That again can be explained by the industrial development after the velvet revolution. The communist regime focused a lot on large scale industrial production, such as coal mining, chemical industry and steel production. This decrease also correlates with the population changes, which I will demonstrate in the next chapter concerning demographics and unemployment. Here is a forecast for GDP growth in the Ústí region leading up to the year 2030:



Graph 6 GDP forecast 2030

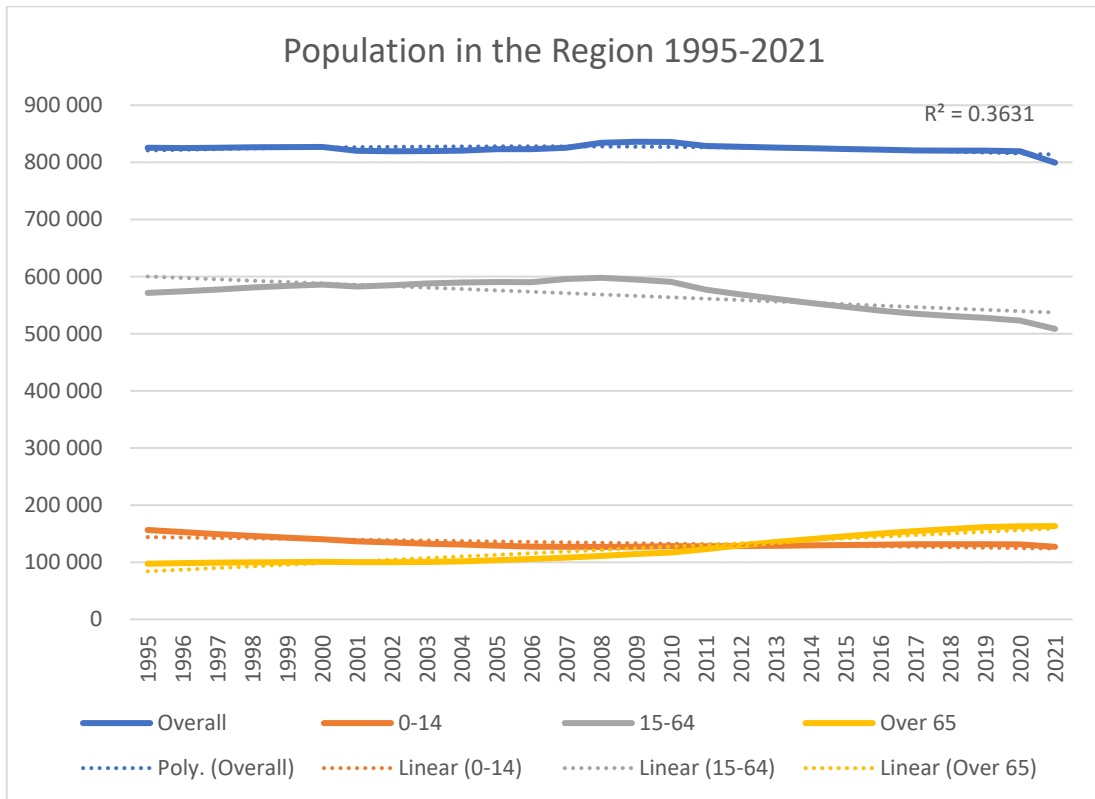
(CZSO,2022) (Own Graph)

A steady increase is expected, although it will depend a lot on external factors such as demand for locally produced goods and foreign investments.

4.2 Demographics

Ústí region is dealing with a decline in population and especially a decline in economically active age group (15-64). This is an issue for the region, as a lot of economically productive people are leaving the region, which is decreasing its economic power significantly. Also as we will see in the data, the population is aging and that brings more problems as well. People over 65 year old mostly don't contribute to the productivity in the region and they create

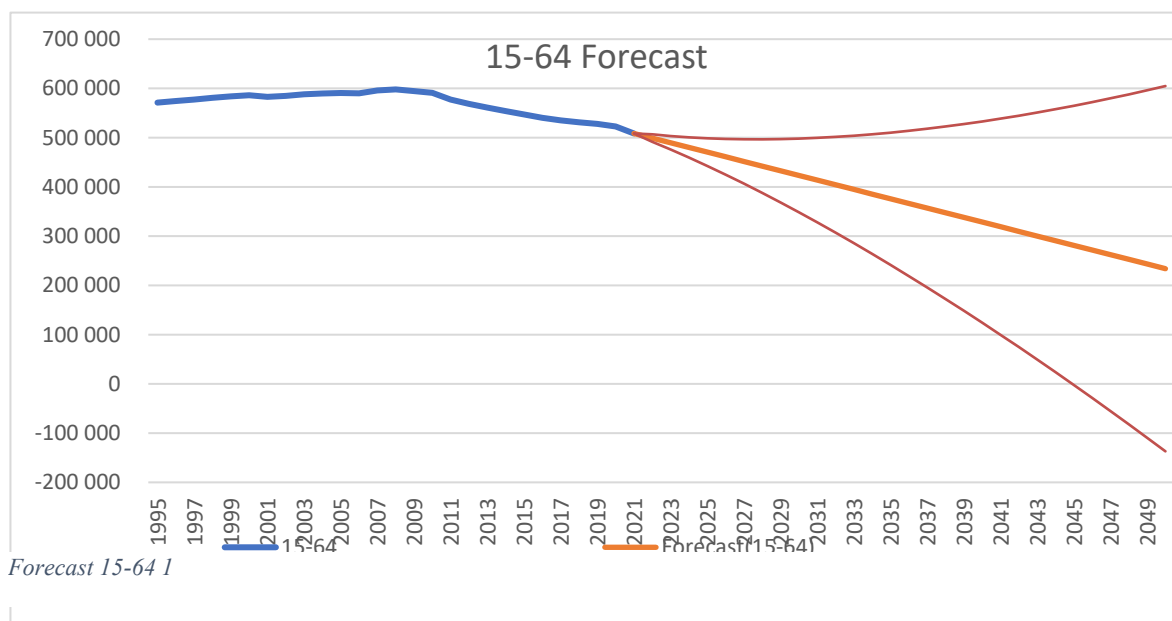
more pressure on social services and healthcare. Let's take a look at a time series graph to illustrate the situation among different age groups



Graph 7 Population development

(CZSO,2022) (Own Graph)

We can see in this graph, that the demographic development of Ústecký region is not looking good. The number of people in productive age and children is decreasing, while the senior group is growing. The cause of this trouble can be found in our previous points about the development of local industry.

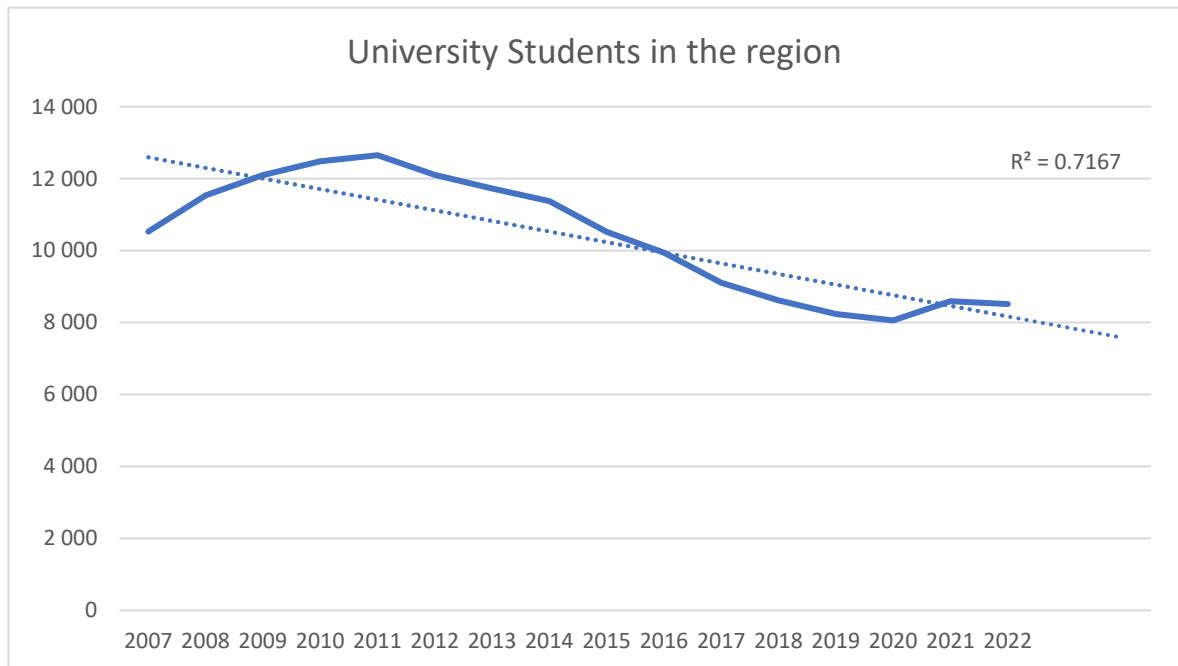


Graph 8 15-64 age group forecast

In this forecast we can see a huge population decrease in the age group 15-64, this is something that shouldn't be taken lightly as people in this age are needed for the economy.

Education opportunities are also an important factor in the decline of young people. This problem is rooted in the lack of quality university education as well as the lack of job opportunities in the region. In 2017 only 35% of the population graduated achieved a Maturita education level or higher⁸, the same amount graduated high school without a Maturita and 21,7 % only completed elementary education. This fact can have a negative impact on firms, that want to produce technologically advanced goods, or operate in an environment, where high qualification is required. That results in most jobs in the region being low-skill manual labour. (KRAJSKÝ AKČNÍ PLÁN VZDĚLÁVÁNÍ, 2017)

⁸ Of that about 7-8 % has university education



Graph 9 University students in the region

Here we can see, that the number of university students in the region is steadily decreasing, which is a bad sign since in order to attract big foreign investments, the region needs to have a more educated and qualified workforce. It is also showing negative migration, since young ambitious people are leaving to pursue their education in a different region.

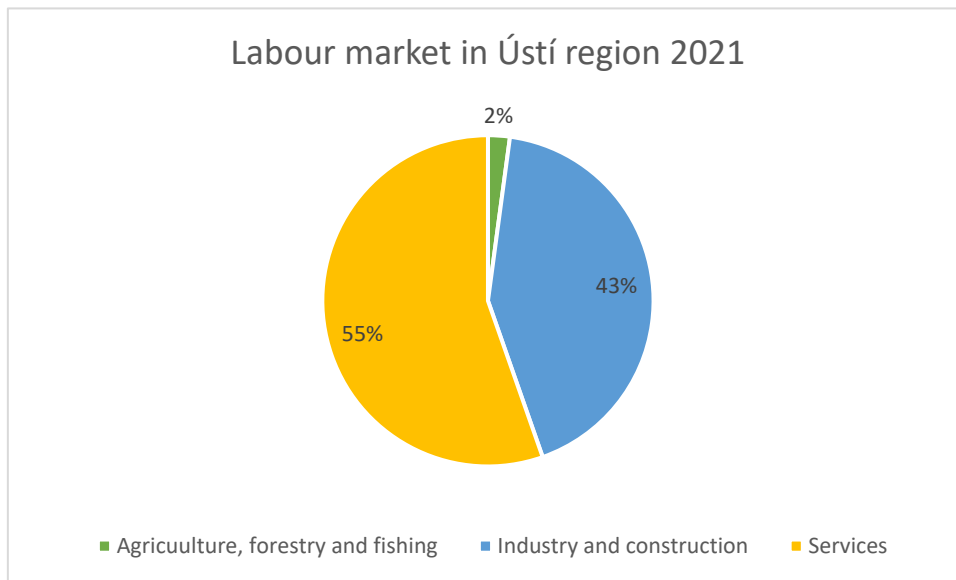
4.3 Employment

The labour market consist of mainly manual labour professions, this is caused by several factors, which are similar to the previous ones (ÚŘAD PRÁCE, 2021):

- Low level of education
- Qualified people leaving the region to seek jobs elsewhere
- Hostile environment for firms in technologically advanced fields
- Aging population
- Prevalence of industrial production

These factors stand behind many problems in the region as you can notice. They can be solved by encouraging young people to pursue education and find work in the region as well

as trying to bring in new investments. Now in the following chart, you can see how different sectors in the labour market are represented. Services include many different occupations, direct services like shopkeeper etc. to office jobs.



Graph 10 Labour market in the Ústí region 2021

(CZSO,2022) (Own Graph)

In comparison to the state of the labour market in 1995, it's been mostly the same, with a decrease in agriculture and an increase in services.

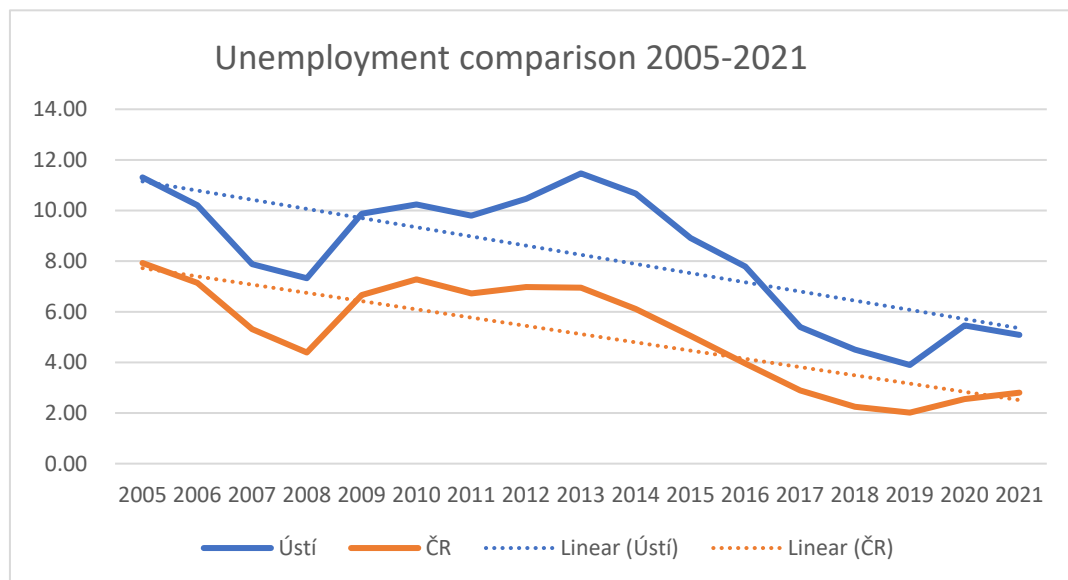
When it comes to unemployment, Ústí region is one of the worst in the Czech Republic. It is currently 5,08%, but that is fairly good compared to the year 2005 for example, which is when this metric was first measured by the statistical office. That year there was a staggering inflation of 11% in the region. (CZSO, 2021)

Compared to the national average of 2,8% it is still quite high. Historically, structural unemployment was the biggest problem, because after the velvet revolution many mines and industrial plants were closed and the workers lost their jobs and had to find different occupations. That was especially hard, since they had no other qualification. The current causes of unemployment are following (ÚŘAD PRÁCE, 2021, pg.10):

- Economy focused on industry

- Overload of the transportation infrastructure
- Low level of education
- High criminality and other socio-pathological phenomena⁹
- Insufficient integration of minority groups, who often live in segregated locations
- Social benefits are too high compared to the wages¹⁰
- Lack of good employers
- High level of insolvency¹¹
- Covid-19 measures

Now we'll compare unemployment rates of the region with the Czech Republic as a whole. This is what a time series graph looks like:



Graph 11 Unemployment comparison 2005-2021

(CZSO,2022) (Own Graph)

Here we can see how the overall unemployment rate compares to the one of Czech Republic. The lines copy each other more or less, but Ústí region is suffering from a significantly higher unemployment than usual. Reasons for that have already been listed.

⁹ Drug addiction, gambling, alcoholism

¹⁰ Some people are less motivated to work, when they can just receive social benefits

¹¹ Second highest number of insolvencies in the country

4.4 Investments

The region is one of the most funded ones by the European union. There are over 2000 funding projects running currently as a part of the European Regional Development Fund. These projects are focused on a variation of things, ranging from entrepreneurship and innovation, to social support and mainly environmental support. Another big investment from the European union is the Just transition fund, which is supposed to help regions, that are struggling to adapt to the new European environmental regulations. The region is set to receive 42 billion CZK in the span of 7 years, which are meant to be invested in activities that promote innovation and sustainability. (RSKUK,2021)

When it comes to private investments, the region is trying to attract firms who are in the automotive and technological industry. While the region's transportation infrastructure is in fact quite overloaded, it still offers a good strategic place with access to Germany through its highways and railroads. It is also very attractive for waste management companies and general industrial companies, who like to make big investments here. For example a company called OI Manufacturing Czech Republic, which produces glass bottles made a 859 milion CZK investment in the region. Czech investment agency Czechinvest mediates investments in the region, here we can take a look at the number of investments they created between the years 2008-2015(USTECKY DENIK, 2016):

Ú Investice sjednané CzechInvestem v Ústeckém kraji

rok	počet projektů	výše investice (mil. Kč)	počet nových pracovních míst
2008	11	1 973	865
2009	12	3 780	331
2010	7	2 211	1 043
2011	14	6 214	1 333
2012	30	2 935	1 218
2013	9	3 092	1 203
2014	19	30 986	3 231
2015	15	7 008	1 575

Infografika: Denik

zdroj: CzechInvest

Table 2 Investments in the region

(USTECKY DENIK, 2016)

Conclusion

The goal of this paper was to evaluate the economic development of Ústí region. That was mainly done by comparing how certain metrics concerning the regions economic development overtime and then compared to the country as a whole.

Foundation of regional development theories was laid down and basic macroeconomic indicators were described. As well as the characteristics of the Czech Republic and Ústí region. The regions characteristics were then evaluated by comparing it to the development of the country as a whole and by using statistical methods to determine its historical and future development.

Data was taken mainly from the Czech statistical office. GDP was compared to the GDP of Czech republic using a time series graph with GDP per capita over the last 26 years. Demographics of the region and relating issues were described. Main issues found there were the migration of young people out of the region and consequentially the aging population. That is an issue in most underdeveloped regions unfortunately. I also gathered data regarding unemployment and delved into the causes. After that, investments in the region were regarded.

As we can see in the numbers and tendencies, the region is struggling to grow economically, because of its many socio-economic issues. These issues include unemployment, high criminal rate, low income, air pollution and an aging population. Although there are efforts to mitigate these issues, they are still insufficient and the region is on a downward trend. Despite being one of the regions receiving the most funding from the European union, the situation is still dire. The region hasn't fully recovered from the transition to market economy, as many sources of income and employment have disappeared. Its aging population also poses a huge obstacle for future growth. GDP growth is quite steady fortunately, but that can be explained by rising inflation and the Czech Republics GDP rising as well.

In regards to the future, the region will have to deal with its demographic problem, by creating more opportunities and incentivize young people to move there. That can be achieved by investing and using the money efficiently to create new education opportunities and incentivize modern advance companies to operate in the region and find qualified workforce there. It should also aim to stabilize unemployment, by dealing with its social problems and shift the focus of its educational system to qualifications that better satisfy the demands of the labour market. One more critical thing is improving the transport infrastructure, that would allow it to export goods more efficiently, especially to Germany.

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