

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Economics**



## **Bachelor Thesis**

**Unemployment in the Czech Republic**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## BACHELOR THESIS ASSIGNMENT

Aneta Čeplová

Economics and Management

Thesis title

**Unemployment in the Czech Republic**

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### Objectives of thesis

This bachelor thesis is focused on the problem of Unemployment in the Czech Republic. In the Theoretical part the relevant terms related to the unemployment will be introduced. Furthermore, the worldwide general overview about the topic unemployment will be presented.

### Methodology

The practical part of the thesis is dedicated to the development of unemployment in 2012 to 2021 period. Additional objective of the research is to give a proper suggestion upon the observed prognosis. In this part the regression analysis will be implemented as a selected statistical method.

**The proposed extent of the thesis**

40 – 50 pages

**Keywords**

Czech Republic, GDP, labour market, unemployment rate, population

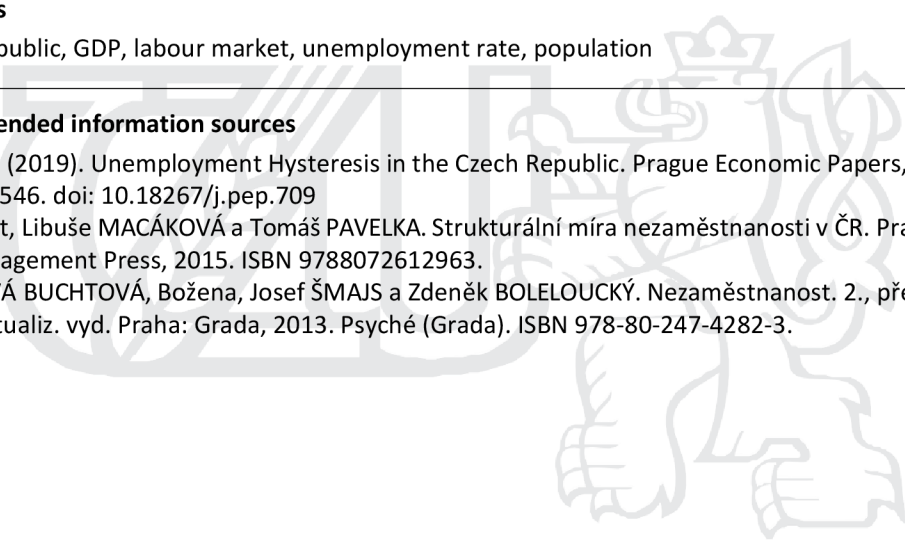
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**Recommended information sources**

Bechný, J. (2019). Unemployment Hysteresis in the Czech Republic. Prague Economic Papers, 28(5), 532-546. doi: 10.18267/j.pep.709

POŠTA, Vít, Libuše MACÁKOVÁ a Tomáš PAVELKA. Strukturální míra nezaměstnanosti v ČR. Praha: Management Press, 2015. ISBN 9788072612963.

ŠMAJSOVÁ BUCHTOVÁ, Božena, Josef ŠMAJS a Zdeněk BOLELOUCKÝ. Nezaměstnanost. 2., přeprac. a aktualiz. vyd. Praha: Grada, 2013. Psyché (Grada). ISBN 978-80-247-4282-3.



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## **Declaration**

I declare that I have worked on my bachelor thesis titled " Unemployment in the Czech Republic" 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 11.3.2022

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Aneta Čeplová

### **Acknowledgement**

I would like to thank my supervisor prof. Ing. Mansoor Maitah, Ph.D. et Ph.D. for the great advice and suggestions during my work on this thesis.

# The unemployment in the Czech Republic

## Abstract

This bachelor thesis is focused on the problem of Unemployment in the Czech Republic and the consequences it brings. In the Theoretical part the relevant terms related to the unemployment will be introduced, along with identifying the types of unemployment and what is the unemployment rate. Furthermore, the causes and impacts of unemployment will be presented.

The practical part of the thesis is dedicated to the development of unemployment in 2012–2021 period. In this part various statistical methods will be implemented: basic statistical methods, correlation coefficient without the trend by calculating the theoretical values for calculation of residual, average growth rate, linear regression, pie chart, chain base index and fixed base index. The work will end with a conclusion along with a proposal on how unemployment could be reduced.

**Keywords:** Czech Republic, GDP, labour market, unemployment rate, economic activity, inflation, average gross wage, causes of unemployment.

# Nezaměstnanost v České republice

## Abstrakt

Tato bakalářská práce je zaměřena na problematiku nezaměstnanosti v České republice a důsledky, které přináší. V teoretické části budou představeny relevantní pojmy související s nezaměstnaností, společně s identifikací druhů nezaměstnanosti a co je míra nezaměstnanosti. Dále zde budou představeny příčiny a dopady nezaměstnanosti.

Praktická část práce se věnuje vývoji nezaměstnanosti v období 2012–2021. V této části budou uplatněny různé statistické metody: základní statistické metody, korelační koeficient bez trendu pomocí výpočtu teoretických hodnot pro výpočet reziduí, průměrná míra růstu, lineární regrese, koláčový graf, řetězový index a bazický index. Práci zakončí závěr společně s návrhem, jak by bylo možné snížit nezaměstnanost.

**Klíčová slova:** Česká republika, HDP, trh práce, míra nezaměstnanosti, ekonomická aktivita, inflace, průměrná hrubá mzda, příčiny nezaměstnanosti.

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# 1 Introduction

Unemployment is a long-term complex issue that is affecting all countries regardless their development of economy and national welfare. International Labour Organization states that the definition of an unemployed person is as an individual older than 15 years, that is during specified period not employed, yet is actively seeking for a job opportunity and is able to start working within two weeks. As of modern world there is no country to deal with just full employment. This wide macroeconomic topic influences both economic and social sphere and the society had been dealing with unemployment since the Industrial Revolution. The financial and economic crisis in Europe occurred during the period 2008–2009 and that resulted with rise in unemployment. This incident was given more attention ever since. The growth of the unemployment reflects on country's welfare as it results in decrease in domestic GDP. Countries dealing with poverty are more affected. This acute problematic phenomenon is described with relationship of where demand and supply meet but aren't in balance. In labour market the demand is provided by the employers and the side of supply is provided by the employees. Yet each side aims to maximize their utility.

Unemployment is connected mainly with negative impacts on both country and its budget, society, and county's government. Individual's loss of job has impact on their mental state which can even lead to even some physical problems. Generally, a person with higher education has more job opportunities and employability, however there is no warranty of obtaining the desired job based on achieved degree. To ensure healthy and growing economy of a country, a certain level of the unemployment is necessary and is known as the natural rate of unemployment.

Prague, as the capital city of the Czech Republic has the largest regional labour market in the country. Its aim is to ensure long-term economic development along with maintaining its position as a regional leader in Central Europe. The importance of the topic is high and therefore a special attention will be given to the Czech government and the measures they implement, along with providing with a prediction that will display possible outcome of Czech development of its economy in circumstances of unemployment present within the workforce.

## **2 Objectives and Methodology**

### **2.1 Objectives**

The aim of the thesis is to describe the main relevant terms to topic of unemployment. The next aim is to analyse the indicators and development of unemployment in the Czech Republic for period from year 2012 up till 2021. The analysis of indicators will follow with its subsequent evaluation and design measures for their favourable development. The analysis' focus will consist of the following indicators:

- Overall unemployment
- Unemployment rate in individual regions
- Unemployment rate based on gender
- Unemployment by age groups

### **2.2 Methodology**

The bachelor thesis is divided into two parts. Theoretical and practical part. The first theoretical part is dedicated to research from the specialized literature and electronic sources to introduce the topic of unemployment along with relevant terms such as: employment, types of unemployment, relationships that occur within it, identification of risk groups, characteristics of social and economic consequences within the unemployment, and additional information related to this topic. Furthermore, the role of state employment policy is presented. Focus will be also on the unemployment rate itself along with its calculation and explanation of the result obtained from formula. The main causes of unemployment will be identified along with the minimal wage of the country. Finally, employment policy will be introduced.

The second analytical part of thesis is dedicated to own analysis of unemployment of the Czech Republic during 2012–2020. Overall unemployment rate will be observed along from the perspective of individual regions, age groups and gender. The values there obtained will be compared with the previous period following with the evaluation of in which region the unemployment rate was the highest and in which were the lowest and why.

## **3 Literature Review**

### **3.1 Unemployment perceived as a macroeconomic concept**

The first chapter is dedicated to the basic terms and theoretical background related to the topic of unemployment.

#### **3.1.1 Unemployment**

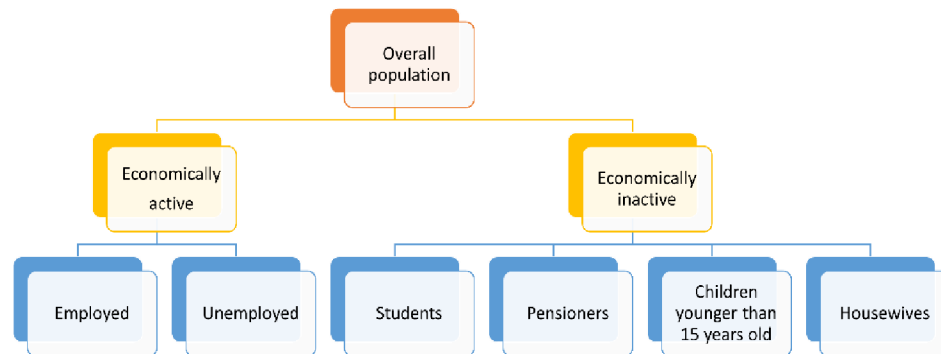
Unemployment is a state where in labour market the demand for manufacturing factors outweighs its supply. In labour market on a side of a supply we have household which indicates owners of factors of production facing companies demanding these factors of production as on the side of demand. Czech Statistical Office defines it based on records of jobseekers of the Labour Office which determines so called registered unemployment. International definition of unemployed based of ILO is any individual of age 15 and older and meets the following three criterions: in observed period was actively seeking for a job through a Labour Office or directly in particular enterprise or a job advertisement, had not been employed, and is able to begin working within 14 days.

Unemployment is a situation in labour market where people seek job opportunities consistently however, they cannot obtain one as there are not enough offers or because the certain job offer in labour market does not meet requirements of the individual (Urban, 2004).

#### **3.1.2 Population Structure in the Czech Republic**

The population of Czech Republic is divided into two categories. Such as economically active also known as workforce and economically inactive. The Czech Statistical Office carries out at regular intervals throughout the year in a questionnaire in labour force sample surveys and defines the workforce to be represented by the individuals of age 15 to 64 which meet the conditions for inclusion into groups of employed or the unemployed. Into a category of economically active.

**Figure 1: Overall population structure**



Source: own processing according to Brožová 2003; Pavelka, 2007

### **3.1.3 Economically active population**

#### Employed:

- All individuals that perform any remunerated work either by being employed by someone or solely performs their duty as an entrepreneur or freelancer.
- Any individuals with an occupation but cannot work due one of following reasons: an illness, vacation, maternity leave, or due an industrial action (Samuelson, 1991).

#### Unemployed:

- Any person over 15 years old which is currently unemployed and is not performing any work at the occupation for which they could earn wages.
- Seeks a job on active basis and there is evidence of them doing so through either Labour Office, a private employment agency, seeking employment directly in the enterprise or just through a small advertisement, and when they find their desired job, they are willing to start working within 14 days (Brčák, 2010).

### **3.1.4 Economically inactive population**

- This group also known under alias the Others, would comprise of all individuals actively studying, suffering a serious illness or disease, who are unable to meet their duties or simply do not want to work, are a housewife, children younger than 15 years old or a person in the retirement (Brožová, 2003; Pavelka, 2007).

### 3.2 Unemployment rate

To express the level of unemployment in the national economy the most often used indicator is the unemployment rate. This indicator is calculated by dividing the number of unemployed individuals by population that is economically active, which contains of employed and unemployed. The result is then multiplied by 100 to obtain unemployment rate in a percentage value. Equation below displays this relationship. The amount of unemployed is denoted by U. The total workforce is represented by L which in the equation is the sum of E and U. Individuals employed in the production forces are denoted by the letter E., and individuals remaining continuously unemployed that seek a job and are willing to work are indicated with letter U (Brčák & Sekerka, 2010).

$$u = \frac{U}{E + U} \times 100(\%)$$

$u$  ... the unemployment rate described in percentage

$U$  ... the amount of the unemployed

$E$  ... the amount of the actively employed (Pavelka, 2007)

### 3.3 The types of unemployment

In analysis of labour market of unemployment, we can distinguish the following types of the unemployment:

- Frictional
- Structural
- Cyclical
- Seasonal
- Technological

### **3.3.1 Frictional unemployment**

Frictional unemployment is completely natural type of unemployment for short periods and is mainly voluntary. This unemployment arises because of the constant movement of people who leave their old job and start to look for new jobs with better conditions which could be for example a greater chance of career advancement or better salary. On the labour market there are always some people who were fired due to organizational reasons or dissolution of the company. This category contains people who left their jobs willingly, individuals that are moved out and are looking for new job in their new residence's surroundings, and people who freshly completed their studies and seek a job opportunity (Jírová, 1999; Buchtová, 2002).

The duration of unemployment is rather short. Approximately from 6 to 12 weeks. It is determined mainly by the time which person needs to find a new job. According to Mareš: *“It is reasonable to state that with the more acceptable system of unemployment the longer the job searching time becomes.”* People won't be willing to work for certain types of jobs if the benefits they receive during time of their unemployment are higher than the wage they would receive when working so they will prefer to remain unemployed (Mareš, 2002; Knoll, 1993).

This type of unemployment is related also to the school graduates and the housewives who chose to abandon their duty and enter an employment. Even though the frictional unemployment is short-term and only temporary it is inevitable. This type of unemployment is not perceived as a serious problem as after certain period of being unemployed the individual manages to find a job (Buchtová, 2002).

### **3.3.2 Structural unemployment**

This is another example of completely natural form of unemployment just like with frictional unemployment. However, in contrast this type of unemployment stands for periods of being unemployed that are rather long with just little anticipation to look for appropriate job. It is caused due to inequality among qualifying requirements for various types of professions, vacancies that are in a given place with the existing qualifications of the workforce and their allocations. It occurs in case of changes in the economic conjuncture leading to employees' skills antiquation. Certain job industries are expanding in a country and others decline (e.g.: industry) which causes changes in composition of labour demand

whereas the supply is not adjusting fast enough in any of the sectors. As there is irregularity within regional labour markets due to identical amount of job seeking individuals and the number of available jobs (Buchtová, 2002).

When comparing structural and frictional unemployment the structural usually lasts longer than frictional because the workforce is obliged for a requalification or must move to different region to seek a new job. It can take up to even several years. A good solution to radically decrease this type of unemployment would be if people were to rise their education level and continuously qualify themselves to be able to exert a wider range of jobs (Buchtová, 2002).

### **3.3.3 Cyclical unemployment**

Cyclical unemployment is a typical macroeconomic type of unemployment. It relates to short-term fluctuations in economic activities and occurs when entire economy is experiencing an economic downturn where the unemployment rate rises, companies are discharging their employees and the production is decreasing. It can also occur in case when company does not estimate appropriately its demand and produces excessive amounts of goods that leads to a surplus of supplies and unsold goods which will have impact on the economy. Such mistake may result in a chain reaction to which the company will have no other choice than to discharge their employees. As household's are experiencing decline in income, they must reduce their demand for consumer goods (Holman, 2011).

It is caused by shortage in aggregate demand due to the decline in the interest of companies, leading to them beginning to reduce their demand for investment goods, such as buildings and machinery. A characteristic feature of this type of unemployment thus is the excess of labour supply over the demand for it and is represented by workers who are willing to work and offer a service at a given wage rate, however the demand for that specific job is too low so those workers remain unwillingly unemployed (Brožová, 2003).

To partially mitigate cyclical unemployment from happening it would be necessary to reduce weekly working hours. It cannot be solved by requalification neither by moving workers to a different region (Jurečka, 2017).



### **3.3.4 Seasonal unemployment**

As the title already suggests, this unemployment is affected by the change of seasons and is linked to the cyclicity during the year. It concerns the demand for work in particular sectors. As certain season has pleasant conditions to certain industry others have unsatisfactory conditions and that leads to rising of unemployment. It's mostly relevant for agricultural, tourism or construction sector (Pavelka, 2007).

An additional example would be goods that are demanded only during specific season. For example, Easter products and decorations, summer clothing, Christmas products and decorations, winter clothing and so on (Mareš, 2002).

### **3.3.5 Technological unemployment**

As economies are developing, newer inventions are introduced to convert more manual work into automated. With new machinery applied the less employees are needed therefore technological unemployment occurs. This type of unemployment mostly concerns workers that are unskilled or semi-skilled, however it also concerns workers with a high education (Kotýnková & Němec, 2003).

## **3.4 Voluntary and involuntary unemployment**

Additional division of unemployment is based according to the unemployed individuals and their willingness of the to accept work that is offered for certain wage given by the market. Voluntary unemployment represents frictional and structural type of unemployment. Involuntary unemployment that arises from impulse of employer would be represented by the cyclical unemployment.

Those types of unemployment began to be distinguished since published piece by John Maynard Keynes "The General Theory of Employment, Interest and Money" (1936). During that time neoclassical economists would consider all existing unemployment to be voluntary. Keynes in his book mentioned for the first time an existence of involuntary unemployment and pointed out its importance. He presumed that involuntary unemployment is related to the lack of aggregate demand (Fuchs & Tuleja, 2003; Liška et al., 2004).

### 3.4.1 Voluntarily unemployed

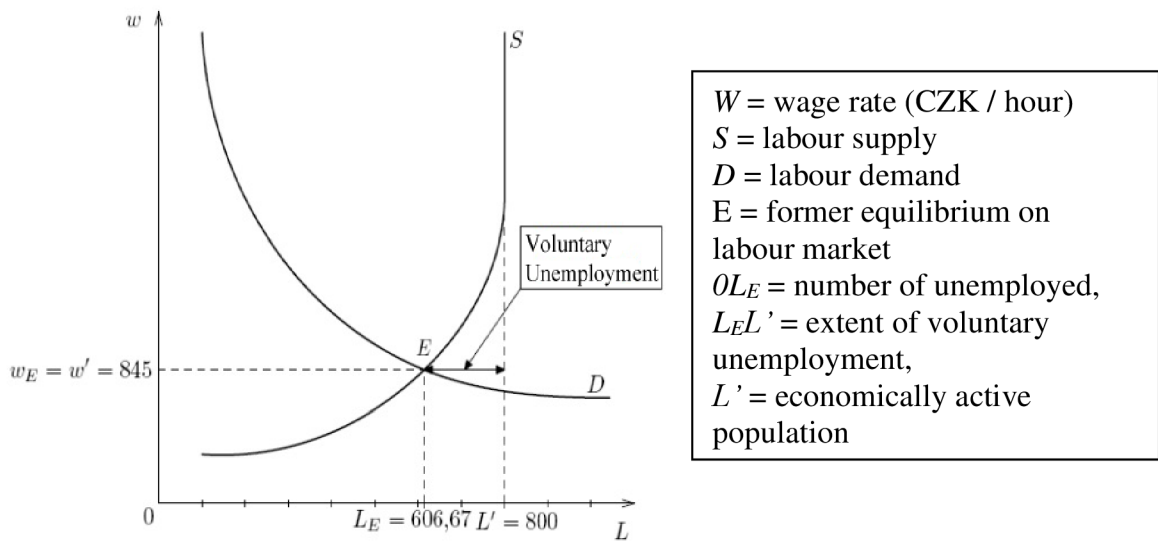
Voluntarily unemployment is also referred to as the Frictional unemployment. When a person willingly left their job and prefers a different activities and free time over working, that is what is understood by voluntary unemployment. Such person is unwilling to accept a job offer at market-determined wage. Reasons for a person to become voluntarily unemployed may be generous unemployment benefits from the government which make idea of working less attractive, marginal tax rates being too high which has negative impact on effective take-home pay, jobs appearing too tedious or rather humiliating to do.<sup>1</sup>

Example of voluntarily unemployment is when companies offer job positions however people have different interests in what job they would like to do and seek jobs that provide higher salary or will be more suited to the individual's skills and qualifications. Therefore, they remain unemployed and prioritize their free time. It can be described as a sort of transfer of the population from one employment to another. Such case can occur during for example when employer decides to close an existing organisation or when the employee is moving to a new city or a country. The individuals who are unemployed voluntarily may have several jobs offers, but actively, they are looking for the opportunity that will suit them the best. If the situation on the labour market would have a Perfect competition, then the unemployment would be just voluntarily due to the fact that when a part of an economically active population is unemployed there is an equilibrium between the supply and demand. This concludes the absolute number of people searching work is higher than the number of vacancies (Buchtová, 2002).

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<sup>1</sup> Economicshelp [online]: Voluntary unemployment. 2017.  
WWW: <<https://www.economicshelp.org/blog/27673/concepts/voluntary-unemployment/>>

**Figure 2: Voluntary unemployment**



Source: FUCHS, K. a TULEJA, P. *Základy ekonomie*. 1. vyd. Praha: Ekopress, s. r. o., 2003. s. 140. ISBN 80-86119-74-2.

In case of equilibrium in labour market, then for a given real wage rate ( $w$ ), the amount of work offered equals the amount of work demanded. The line  $S$  represents the supply of vacancies. Line  $D$  represents the demand for job and  $L'$  which stands for labour, is representing economically active population. In case of equilibrium wage rate, the enterprises will be accepting all customers that accept this rate ( $W_E$ ). The employed are featured on line  $OL_E$ . The voluntarily employed group is represented by line  $L_E L'$ . From the figure Voluntarily unemployment is clear that a portion of labour force will refuse to work during given wage rate and assuming perfectly flexible wages (Fuchs & Tuleja, 2003; Liška et al., 2004).

### 3.4.2 Involuntarily unemployed

This type of unemployment is often perceived as form of cyclical unemployment due its nonexistence of vacancies. Unemployed individuals seek for a job which prevails in the labour market (Buchtová, 2002).

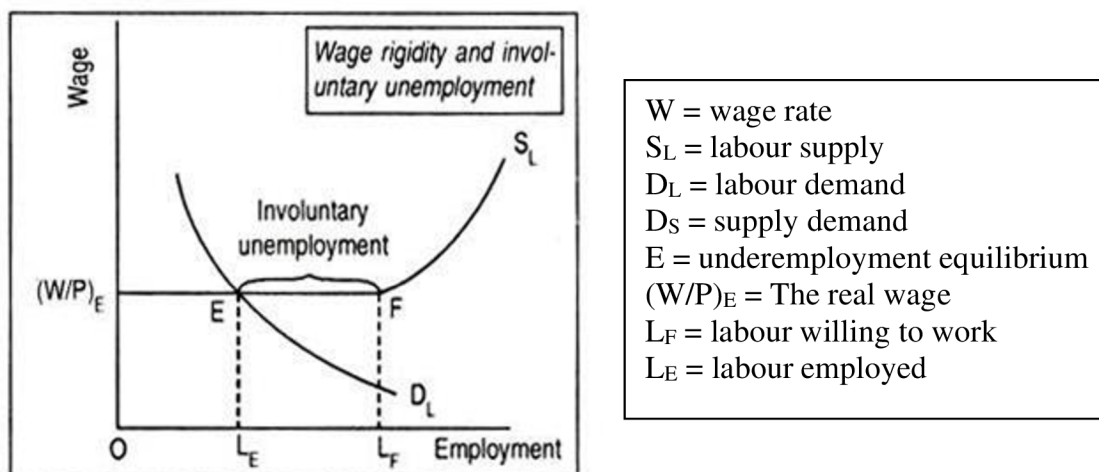
The labour supply is higher than the labour demand. People willing to work at normal wages are unable to find work application due to employer's lack in these positions. Therefore, they become involuntarily unemployed. They are willing to work even at the price

of minimum wage, but there is no suitable employment for them on the labour market (Krebs et al., 1997).

In line with Keynes, situation for full employment may occur only through an astrological coincidence due that he introduced a hypothesis about underemployment equilibrium. As there is wage rigidity present the economy can never reach full employment. “For situations where individuals are unable to find a job at ongoing wage rate, they become ‘involuntary unemployed’” (Pissarides, 2000).

Keynesian also known as cyclical unemployment, which is caused by downturns in the economy, is the deviation of unemployment from its normal rate of unemployment also known as the natural rate (Pissarides, 2000).

**Figure 3: Keynesian model: Involuntary Unemployment**



Source: Pissarides, C. A. (2000). Equilibrium unemployment theory (2nd ed.). MIT Press.

Figure 3. Assumes wage ( $W$ ) to be fixed. Labour supply ( $S_L$ ) consists of two parts and is perfectly elastic due the rigid wage. The labour supply curve that is associated to the wage ( $W$ ) is horizontal. Anything exceeding this wage rate, money wages, can grow at any time. This explains the positive sloping of labour supply ( $S_L$ ) curve.<sup>2</sup>

When it comes to demand labour curve ( $D_L$ ) it is assumed to be associated to the actual wage rate in a negative way in the Keynesian system. To reach the labour market’s equilibrium, the demand labour curve ( $D_L$ ) must cross the demand supply ( $D_S$ ) curve on its

<sup>2</sup> Economicsdiscussion [online]: Keynesian Theory of Involuntary Unemployment. 2016. WWW: <<https://www.economicsdiscussion.net/unemployment/keynesian-theory-of-involuntary-unemployment/17278>>

horizontal axis. Underemployment equilibrium is there represented with the point (E). The real wage rate corresponds to  $(W/P)_E$ . Unvoluntary unemployment value is obtained by making difference between labour that is willing to work ( $L_F$ ) and labour that is currently employed ( $L_E$ ).<sup>3</sup>

## **3.5 Other types of unemployment**

### **3.5.1 Hidden unemployment**

This type of unemployment is very specific. It relates to persons who don't register themselves as unemployed and are neither able to look for job. This category consists of and married women who gave up looking for job due maternal leave by taking on housewife position, or group of studying adolescents. It also includes people who aren't registered under the Labour Office but seeks job directly from the employers. People undertaking requalification, community restitution, those of those with low qualification level, or of high age (in retirement, pre-retirement) also belong into this category (Mareš, 2002).

### **3.5.2 Underemployment**

Underemployment also known as partial unemployment is not exactly a type of the unemployment however it is closely related. In the Czech Republic underemployment had been given attention since year 2001. Group of underemployed includes people who were forced to work just part-time due economic circumstances and therefore are not able to fully utilize their profession skills and qualification skills. The most common are the cases with reduced working hours or job that is shared by two people. There is an attempt to fill the labour market with younger population so experiments such as reducing working days from 5 to 4 are introduced. In case when a not qualified individual takes on a job with reduced working hours and for low wages, they exit the group of unemployed, however the workforce is not used efficiently (Mareš, 2002).

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<sup>3</sup> Slideshare [online]: Keynesian model of unemployment (macroeconomics). 2017.  
WWW: <<https://www.slideshare.net/AlbinaGaisina/meeting-8-keynesian-model-of-unemployment-macroeconomics>>

### **3.5.3 False unemployment**

Some people prioritize taking on unemployment benefits over seeking for a job. Even though they are registered under Labour Office, they refuse any job offers from Labour Office and neither want to look for job themselves. False unemployment also includes those that are registered, yet they work illegally in so called 'grey economy' (Mareš, 2002).

### **3.5.4 Full unemployment**

This type of unemployment is a state of national economy where all individuals wish to work and are actively looking for a job. In other words, it is the state where the economy takes place at the level of potential output. In these conditions the rest of unemployment would be voluntary. However, achieving a full unemployment in a country is unrealistic. Every democratic society has groups of individuals who do not want to work, do not seek for a job, or tries to avoid having one. Convincing those people to work is a rather difficult task, however it is possible by reducing amount of people who are not willing to work by applying appropriate methods and by that getting one step closer to the full employment (Buchtová, 2002).

### **3.5.5 Short-term and long-term unemployment**

A short-term unemployment does not pose a serious issue in economy nor within the society. It is the time that unemployed people in the labour market need, when they are looking for a new or better paid job which corresponds to one's skills and abilities. This type of unemployment relates to the Frictional and Structural unemployment. It lasts up to one year but most commonly it is no more than six months.

Long-term unemployment is both economic and social issue that poses a grave problem to the society. This unemployment's side effects can lead to social consequences not only for an individual, but also projecting onto their family. Furthermore, this can lead to loss of qualification for the job and in the worst cases their standard of living can decline, they get into existential crisis or lose self-respect. This type of unemployment refers to individuals unable to find a job for years. Rather than perceiving unemployment according to its rate it is more important to view it from its time length. As an example, when long-

term unemployment can occur would be during long-term economic recession or long-term wage rigidities. If county is too generous with financial support for the unemployed that may lead to less willingness to seek a job as one loses their motivation and becomes too comfortable during their unemployment. When selecting new candidates, firms will be discouraged by the fact when an individual had been unemployed for a long time and because of that, they may have lost their expertise and other working habits. Willingness to employ such a person are very low (Brožová, 2003).

### **3.6 The causes and impacts of unemployment**

When the unemployment becomes high it leads to negative impacts for society and the economy of the state. If the unemployment reaches too high level, then the resources are being wasted and people's pensions are low. Such economic difficulties have an impact on family life and their emotions. Decline in income in the society leads to frustration, increase in stress level and loss of self-esteem. This means a certain loss of valuable resources for state's economy. Unemployment has many characteristics of inflation however rather than affecting the whole society it impacts just certain individuals. The impacts can be either social or economic (Samuelson, et al., 1995).

Statutory minimum wage is one of the main causes of the unemployment. It prevents companies from abusing their power and pay out below the minimal wage. Next is the system of social support. Country with too high social benefits leads to demotivation of the unemployed to look for a job. Not to mention the Labour Code, which, unlike other countries, greatly protects all employees along with their rights.

When it comes to the Czech Republic the most notable and serious cause of unemployment is a state intervention, namely setting a minimum wage, incentive system of social benefits and setting high labour taxation (Tvrđý, et al., 2007).

#### Minimum wage

Supply and demand are distinguishing characteristics for the labour market. The floors price of labour is determined by minimum wage. It should be generally below the level of equilibrium price. That helps with lowering unemployment of the people applying for job but lacking qualification, skill, or necessary training for the given position.

The government is the deciding authority for determining what the minimum wage on the floor for labour will be. Every country wants to reduce the inequalities and assure sustainable economic growth, therefore with well-designed minimum wage the country can provide everyone with a decent work.<sup>4</sup>

Minimum wage is one of the main causes of unemployment. It means the minimum number of gross wages in the labour market. By the law it is forbidden for companies to hire someone for a full-time job and pay them below the minimum wage.<sup>5</sup>

In the labour market we can find people willing to work for lower wage than the minimum wage value is and at the same time we can find employers who are willing to provide their employees with lower wage than the value of minimum wage. Such agreement on legal labour market won't occur due to non-compliance with the statutory minimum wage amount. This arises to an unemployment. If such agreement between subjects would occur and employee will not pay the taxes to the government. However, such action would be considered illegal and fall within the 'grey economy'. Furthermore, this person does not fall under protection of the Labour Code.

In the Czech Republic the very first minimum wage was introduced in year 1991. Described as the lowest possible amount of remuneration within the employment relationship. It amounted to CZK 2 000. Up till year 1998 the rate seemed quite stable. Eventually, due recession that pushed the equilibrium wage down, the minimum wage was rising till year 2006 where it began to stagnate at CZK 8 000. Labour Code now distributes of the minimum wage according to the work type.<sup>6</sup>

Minimum wage can be perceived also as a motivational element to look for a job for those with low qualification, so the quantity of vacancies rises. Working conditions are improving when the minimum wage is set correctly, and the disposable income of workers also rises which allows them to make more money that they can spend. In contrast, minimum wage should never exceed labour productivity for individuals who work for minimum wage. Such event would result in the growth of unemployment.

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<sup>4</sup> ILO [online]: Minimum wages: an introduction. 2016.

WWW: <[https://www.ilo.org/global/topics/wages/minimum-wages/WCMS\\_458660](https://www.ilo.org/global/topics/wages/minimum-wages/WCMS_458660)>

<sup>5</sup> MPSV [online]: Přehled o vývoji částek minimální mzdy. 2021.

WWW: <<https://www.mpsv.cz/prehled-o-vyvoji-castek-minimalni-mzdy>>

<sup>6</sup> Sociální politika [online]: Vývoj minimální mzdy od jejího zavedení v roce 1991. 2017.

WWW: <[https://socialnipolitika.eu/2017/01/vyvoj-minimalni-mzdy-od-jejeho-zavedeni-v-roce-](https://socialnipolitika.eu/2017/01/vyvoj-minimalni-mzdy-od-jejeho-zavedeni-v-roce-1991/)

1991/>



**Table 1: Minimum wage development in the Czech Republic**

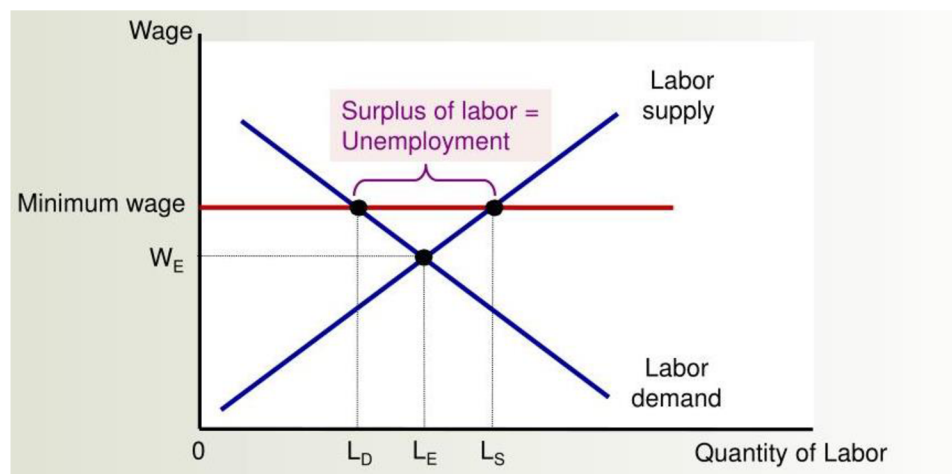
Period	CZK / month	CZK / 1 hour
2010	8 000	48.10
2011	8 000	48.10
2012	8 000	48.10
2013	8 500	50.60
2014	8 500	50.60
2015	9 200	55.00
2016	9 900	58.70
2017	11 000	66.00
2018	12 200	73.20
2019	13 350	79.80
2020	14 600	87.30
2021	15 200	90.50

Source: MPSV, quoted from online (updated 2020-12-14).

In table 1 it can be seen how the minimum wage evolved over upcoming years. It displays data from year 2010 to 2021. For example, the minimum wage in year 2021 for a weekly working time of 40 hours it was CZK 15 200 or CZK 90.50 per single hour.

For three years straight the minimum wage per month was of exact amount and that during 2010, 2011 and 2012. The minimum wage in 2021 is almost double the wage in years from 2010 to 2012. The minimum wage from year 2010 to 2021 and onwards will be increasing due inflation and continued growth of the economy of the state.

**Figure 4: Unemployment from a Wage above the Equilibrium Level**



Source: Mankiw, N.G. Principles of Economics. 6E USA: Cengage Learning, 2008. 890 p. ISBN 13: 978-0-538-45305-9.

The mechanism in labour market of how minimum wages work is featured in above Figure 4. Point where supply and demand are at equilibrium, that is  $W_E$ . It represents a case of balance of the quantity of labour demanded  $L_E$  along with quantity of labour supplied. When the government sets the minimum wage to remain at higher level than what is the balance of supply and demand level, the demand for labour declines and the quantity of supply for labour will rise  $L_S$ . This resulting surplus of the labour,  $L_S - L_D$  is representing the unemployment.

Even though the minimum-wage is one of the most typical starting points for unemployment it does not mean this issue is affecting every working individual. The group of people that gets affected the most on the labour market are those with little skills and low knowledge. For instance, the jobs with manual activities.

### Government policy

Additionally, the rise in the unemployment may be caused through focus on social assurance created by the government that is providing the citizens with monthly payments. The portion of the residents will prioritize to receive social benefits as unemployed rather than working for low wage and within this mindset they lose the motivation to seek a job. The result of this is lack of effort and loss of interest for job with low salary.<sup>7</sup>

### Labour Code

Labour code also plays big role for unemployment. Its purpose is to regulate the relationship in employment between two actors. An employer and the employee with goal to determine an exact boundary within this relationship. As state intervenes within these relations and intention to protect the employees by adjusting of the powers of the employer it often causes employers to increased costs which then reflects on unemployment.<sup>4</sup>

Very comprehensive Labour Code of the Czech Republic indicates over 400 responsibilities for employers. For instance, it is forbidden to terminate the employment relationship without giving a reason and the amount of severance pay, which according to the Labour Code must be at least two months' average earnings. As employer can't dismiss employee in a hurry it adds up to their costs. In order to meet the customers' needs employers

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<sup>7</sup> Reformy [online]: Skutečné příčiny nezaměstnanosti. 2011.  
WWW: <<https://www.reformy.cz/skutečne-priciny-nezaměstnanosti/>>

are expected to be flexible react on time to changed situations on labour market. Such changes need to be done fast to not add up on cost. When the situation on labour market changes, an employer will want to quickly dismiss employees of a certain qualification and instead hire new ones with different abilities. However, this is not possible to do in the Czech Republic due to its Labour Code regulations. The only situation employer can discharge their employees is for redundancy, but that will result with a severance pay for an employer.<sup>8</sup>

### 3.6.1 Economic impacts

The loss in production is one of the most serious problems. This issue is associated with the fact that the economy does not produce enough it is capable of, which then follows with economy not producing as much output as it is capable of and so there is an underutilisation of the living and materialised social labour. This leads to decrease of GDP and places it below the level of its potential which is affecting the growth of economy as well as the possibility of social transfers (Rievajová, 2009).

In situations where unemployment rate is higher than the natural unemployment rate, the economy will produce less than it can at the level of its potential output.

This phenomenon is explained by Okun's law. *“Okun’s law says that if the real unemployment rate is above the natural rate of unemployment by 1 percentage point, then the real output will be below its potential level by two percentage points”* (Pavelka, 2007).

In addition, as state budget is growing it has negative impacts on its economy, as the state must pay out benefits to the unemployed and therefore loses income tax on the non-working people (Jurečka, 2009).

The economic consequences also include the loss or lack of qualification of workers which is often referred to as ‘human capital’ (Helísek, 2002).

### 3.6.2 Social impacts

Social impacts start to occur namely when person remains unemployed long-term. The longer is person unemployed the more negative factors start occurring. To fulfil certain

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<sup>8</sup> Epravo [online]: Výběr z judikatury nejen k zákoníku práce za r. 2018. 2019.  
WWW: <<https://www.epravo.cz/top/clanky/vyber-z-judikatury-nejen-k-zakoniku-prace-za-r-2018-cast-6-109186.htmllosti/>>

social and esteem needs, having a job is necessary. Loss of job is worsening physical and mental condition, causes increase of stress level, feeling of being insignificant, can be a reason for divorce, committing suicide or crime. As part of social impacts are considered: physical load or a divorce caused by unemployment along with pathological phenomena such as criminality, use of drugs, alcoholism, prostitution, etc (Helísek, 2002).

When the person is informed about their upcoming discharge from job it puts a lot of mental pressure on them. It leads to restricting socializing with other people, affects the rhythm of one's working habits and due that such person for employers is not very attractive (Pavelka, 2007).

An unemployed begins to experience pressure, feelings of guilt and insignificance. Of course, such event has a different effect on everyone, and it is perceived and dealt with in various ways. In worst case the unemployed may choose to end their life as they can't handle the mental pressure. In other cases, the unemployed will decide to lower their living standards and because of that people may lose their homes or resort to crime. Better way of coping with such experience is when individual searches for the answers on why they lost their job within themselves and not their surroundings. This can often have positive outcomes when search new jobs as the person will be more motivated, driven and persistent to do well (Buchtová, 2002).

### **3.7 Labour market**

The labour market represents a place where supply meets demand. By supply we mean supply of vacancies and for demand it's demand for a job. With variety of job positions people can choose what best fits their education degree, skills, and knowledge. Each job position requires certain work performance and is rewarded with different salary, which is the reward provided from employer to its employees as a remuneration for work done. If the market wage is higher than equilibrium wage, unemployment occurs. This is due labour market surplus. On the other side, in case when market wage is lower than the equilibrium market wage, this will result with a shortage of workers (Tvrđý, et al., 2007).

In labour market there can be either perfect competition or imperfect competition. In real world the perfect competition cannot really work. It works just for theoretical purposes. As there is lack of some information the labour market is imperfect. Neither authority is

provided with complete information when it comes to availability of vacancies and complete information about unemployed people who are seeking their job (Tvrđý, et al., 2007).

### **3.8 Employment policy**

One of the basic elements of the state's economic strategy is employment policy. It is the result of the state's activities along with employers, employees, and trade unions of the state. Employment policy can be defined as a set of measures that create optimal conditions for a balanced labour market with the correct and efficient use of labour and the safeguarding of citizens' right to employment. In addition, the goal is to achieve full, productive, and freely chosen employment. The government is intervening in the labour market indirectly. By making certain small changes the state employment policy strikes to keep balance of supply and demand within the labour market and generally create conditions for a better functioning market. There are various factors affecting the balance of labour market. The most importance and influence have the economic policy, which with its activities helps supporting the economic growth, vacancies, and employment as whole. Furthermore, there is a policy focusing on labour market with aim to eliminate unemployment and spur employment. Employment policy is essential for national development and economic growth of a state. To maintain the employment growth premises as: low inflation, sound public finances and sustainable economic growth must be met (Halásková, 2008).

High unemployment rate leads to high economic loses and has social consequences such as higher number of people that live below the poverty line or moral hazard. It may affect also political stability of society. Negative development of economic growth is a result of crisis. Employment policy can support labour market's growth and provide guidance towards its success; however, it is unable to radically change it (Jírová, 1999).

Employment policy is divided into two groups:

- Passive employment policy
- Active employment policy

### **3.8.1 Passive employment policy**

Two main purpose of passive employment policy are to: support people who are temporary unemployed and are actively seeking jobs and provide financial benefits to jobseekers who lost their job that meet the conditions set by law to receive this benefit. The financial unemployment benefits should not be so high to discourage individuals from seeking employment or even remaining on financial benefits provided by state, where unemployment then becomes voluntary. Passive employment does not deal with the problems on unemployment it only lowers impact of unemployment in the form of unemployment benefits. Person that meets the conditions set by the law has to be registered at the Labour Office and must apply for those benefits. The length of time the support is paid to the applicant depends on applicant's age. Unemployment benefit payments place a significant burden on the state budget.

The Labour Office will grant the applicant's application on the following conditions:

- The applicant's permanent residence is within the Czech Republic.
- The applicant does not receive a retirement pension.
- During the reference period (which is at least 2 years before being registered with the Labour Office), he/she paid pension insurance for a minimum of 12 months.

With some exceptions, such as people caring for an individual's dependent on the help of others, a child, a volunteer activity with no minimum period of service requirement. In such case there is a working requirement of at least 20 hours per week. State can provide also benefit during requalification. This benefit is available to those who underwent retraining course when applying for their new job usually in duration from 3 weeks up to 10 months (Václavíková, et al., 2009).

### **3.8.2 Active employment policy**

Active employment policy are the measures and tools to maximise the level of employment to the highest possible level, helping with creating new vacancies through subsidies to employers in the employment of candidates and to the candidates themselves.

Within group of active employment policy falls the groups of unemployed people with insufficient qualifications or people suffering some disabilities. It is titled 'active' as there should be an activity on both sides when it comes to unemployed and the state itself. Not everyone is able to utilize those tools appropriately therefore its efficiency is decreasing. Active employment policy is financed by the state budget and use of the funds raised is regulated by special legislation (Kuchař, 2007).

Examples of active employment policy are for example: community services, counselling, investment incentives and socially useful jobs.<sup>9</sup>

The government should aim also to measures that lead labour market towards higher flexibility by providing society with availability of vacancies (Pavelka, 2007).

### **3.9 The impact of the COVID-19 on unemployment**

Since year 2020, the world is facing the pandemic disease COVID-19 which is caused by the virus entitled SARS-CoV-2. The disease is highly infectious especially in case of mutated variants such as Delta and Omicron. People suffering from COVID-19 disease have the following symptoms: cough, fever, tiredness, loss of smell or taste, or a muscle pain. When experiencing COVID-19, most people will develop a mild to moderate respiratory disease without having to be hospitalised. More severe course of illness affects only the weak groups of population such as chronically ill and old people. Such people may experience difficulties breathing or feeling short of breath, have chest pain and in worst case can lead to death. This virus got spread across the world including the Czech Republic from China. First COVID-19 cases were reported on 31<sup>st</sup> December 2019 from Chinese city Wuhan.<sup>10</sup>

As there weren't any existing vaccines for the virus and it had spread through all the countries. The World Health Organization declared an emergency outbreak and COVID-19 began to be characterized as a pandemic since 11<sup>th</sup> March 2020.<sup>11</sup>

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<sup>9</sup> Ministerstvo práce a sociálních věcí [online]: Aktivní politika v zaměstnanosti. 2004.

WWW: <<https://www.uradprace.cz/aktivni-politika-zamestnanosti-1>>

<sup>10</sup> WHO [online]: Coronavirus disease (COVID-19). 2019.

WWW: <[https://www.who.int/bangladesh/emergencies/coronavirus-disease-\(covid-19\)-update](https://www.who.int/bangladesh/emergencies/coronavirus-disease-(covid-19)-update)>

<sup>11</sup> WHO [online]: Director-General's opening remarks at the media briefing on COVID-19. 2020.

WWW: <<https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>>

The first of the invented vaccines that was approved by the U.S. Food and Drug Administration in the United States is entitled 'Pfizer-BioNTech COVID-19' On 2<sup>nd</sup> December 2020. The studies according to the producer showed that this vaccine has up to 95% efficacy in an ongoing large-scale clinical trial.<sup>12</sup>

When it comes to the Czech Republic, on the 1<sup>st</sup> of March 2020 was the first case of the virus being reported. Ones of the firsts three infected were an American student who arrived at Prague for tourism purposes, and she got infected when staying at Milano where she used to study. Another of first victims to virus was a man who likely got infected when visiting the university of Udine in Italy because of conference purposes. Third got infected while skiing in Veneto, Italy.<sup>13</sup>

Situation began to be dire during the second half of February. One of the reasons of significant deterioration was the worldwide nonexistence of the vaccine for COVID-19 at the time and lack of protective equipment in the country such as face masks. Many people began to sew them themselves on a sewing machine. Disease continued to spread at radical rate, the government had to step in with some measures. Such as closure of schools and shift to online teaching. On 12<sup>th</sup> of March 2020 the state of emergency was announced for period of thirty days. All the restaurants and most of the businesses had to remain closed. It was not permitted to hold any cultural, sports, musical, nor any public gatherings. The daily infection rate was just 22 people per day. All private events had a limit of just 30 participants. The public was banned from attending catering services from hours 8 p.m. till 6 a.m. Any food services present in shopping centres and supermarkets were forbidden to operate when exceeding 5 000m<sup>2</sup>. In addition, swimming pools, gyms, clubs along with wellness services had to be closed.<sup>14</sup>

The situation in the Czechia continued to worsen and so the government had accepted critical measurement no. 215 and banned the free movement of all persons with effect from 16 March 2020 from midnight, for everyone on the territory of the Czech Republic. This was taken into effect as of 16<sup>th</sup> March 2020 until the morning of 24<sup>th</sup> March 6:00 of year 2020. Exceptions were necessary visits of family members, paying visit to a doctor or a journey to

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<sup>12</sup> WHO [online]: Coronavirus disease (COVID-19) pandemic. 2022.

WWW: <<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>>

<sup>13</sup> Aktuálně [online]: V Česku se objevily první případy koronaviru. 2020.

WWW: <<https://zpravy.aktualne.cz/domaci/v-cesku-se-objevily-prvni-pripady-koronaviru-dva-jsou-v-praz/r~3eb53e385bd011eaaabd0cc47ab5f122/>>

<sup>14</sup> Zakonyprolidi [online]: Usnesení č. 194/2020. 2020.

WWW: <<https://www.zakonyprolidi.cz/cs/2020-194>>



work along with obtaining the most basic essentials of life from stores or services for themselves or another person who is unable to obtain them themselves. It was recommended to all employers to work through home office, when possible. For a single day the borders of the country were closed from 15<sup>th</sup> to 16<sup>th</sup> March with some exceptions. As part of the measures, it was mandatory to follow basic hygiene in public areas such as wearing face masks at works place and keeping distance from one and other of 2 meters.

Around 12<sup>th</sup> April the first wave of epidemy had its peak where 436 people had to be hospitalised along with 4,750 positive cases.<sup>15</sup>

So far, the highest peak of epidemy was in November 2021, during the week, from 23<sup>rd</sup> to 30<sup>th</sup> with exactly 22,936 infected. International so called ‘infection index’ was the highest during this time as there have been 929 infections per 100,000 people in the country in the last seven days. Death rate in Czech Republic from COVID-19 exceeded 32 thousand.

From Monday to Friday, the country added a total of 84,539 confirmed positive cases of COVID-19.<sup>16</sup>

Covid had a heavy impact on the world’s economy. Many people lost their jobs or were forced to close down their business due lack of income or growing debt. Some people did not have enough cash reserves. The Minister of Finance with the consent of the government issued a measure to provide a financial support to taxpayers whose business was affected or prohibited of its activities by the Government’s Resolution were put into the effect as of 12<sup>th</sup> March. In these measures were included also temporal cancellation of having to use the EET and that until the 31<sup>st</sup> of December 2022. The ‘Antivirus’ programme was created to help and compensate those whose activities were restricted under the measures to prevent spread of the COVID-19 and improving employment retention by compensating a portion of wage cost for employer’s employees.<sup>17</sup>

The circumstances of the coronavirus continued to fluctuate. When the situation was getting better the government uplifted some restriction but that lead to another increase of positive cases so new measures had to be put into the effect. Such events lead to deep fall in the GDP along with deterioration of the domestic labour market (Czech Statistical Office, 2021).

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<sup>15</sup> MZCR [online]: Aktuálně o koronaviru. 2022.

WWW: <<https://www.koronavirus.mzcr.cz/>>

<sup>16</sup> Aktuálně [online]: COVID-19: Přehled aktuální situace v ČR. 2022.

WWW: <<https://onemocneni-aktualne.mzcr.cz/covid-19>>

<sup>17</sup> MPSV [online]: Ochrana zaměstnanosti. 2022.

WWW: <<https://www.mpsv.cz/antivirus>>

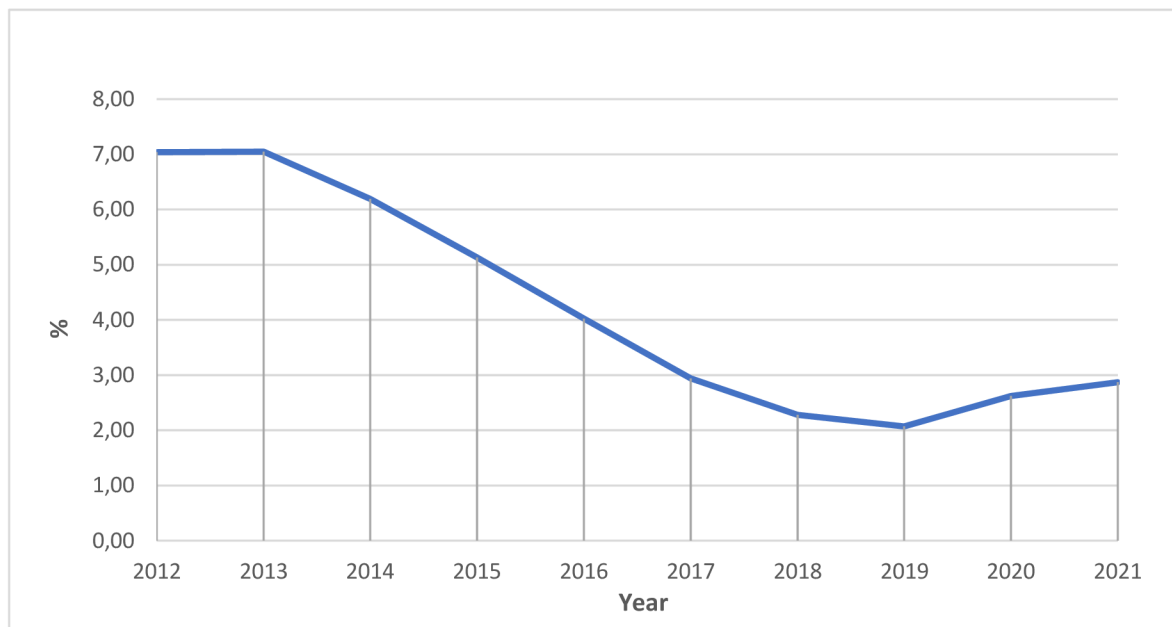
## 4 Practical Part

### 4.1 Development of Czech Republic's unemployment in 2012–2021

The development of unemployment rate in the Czech Republic for selected observed period can be distinguished into two parts:

1. with decreasing trend function (2013, 2014, 2015, 2016, 2017, 2018, 2019)
2. with increasing trend function (2020, 2021)

**Figure 5: Unemployment rate in Czech Republic for period 2012–2021**



Source: CZSO, own processing, 2022

In Figure 5, in the first two years the values didn't change much almost to the point of being stationary. The values then began to decrease and slightly increased from year 2019 onward. The emergence of new companies, commerce, services and economic upturn are the reasons for the unemployment rate's decrease. For the selected period, the lowest observed point of unemployment rate was detected in year 2019 which is the 'pre-COVID' year and from this year onward the unemployment rate began to rise again due the pandemic and its impacts on labour market.

#### 4.1.1 Interval estimate prediction

From the data above, it is possible to make an interval estimate prediction with the addition of a confidence interval with both lower and upper confidence limits. This interval will be held at 95% confidence. Firstly, it is necessary to verify the reliability of the data in order to make a prediction that can be trustworthy, by using REF formula:

$$\text{REF} = \left| \frac{P - A}{A} \right| \times 100(\%)$$

P... the predicted value

A ... the actual value

REF ...relative error of forecast

Which tests the reliability by comparing the differences between the predicted value and the actual value to calculate a percentage that states the reliability for the given dataset. For this data the actual value of unemployment rate in the year 2021 is 2.9. From the calculation the predicted value for the year 2021 is 0.8. The unemployment rate in the dataset was on a decline for the past 8 years, however due to COVID-19 the values for the last two years began to rise rapidly, this throws the trend of prediction off.

The REF shows a result of 72.4% which is much larger than 10% (which is the estimated percentage when the dataset is seen as reliable). Considering that this data is not fully reliable for prediction due to Covid, it is still possible to predict a very rough idea of the percentage the unemployment rate might be at. By using the point estimate system, the predicted unemployment rate percentage for the year 2022 is 0.9533%. The LCL so called 'lower confidence limit' is at -1.375. Since that is unrealistic, as unemployment cannot be in the negative values the LCL for this dataset will be estimated to 0.01%. The UCL so called the 'upper confidence limit' is at 3.28233%. In total the final confidence interval is:

$$P(0.01\% < 0.9533\% < 3.2823\%) = 0.95$$

The average growth rate which is calculate by the formula:

$$\bar{K} = \sqrt[n-1]{\frac{Y_n}{Y_1}}$$

The result from this formula is equal to 0.895699836 percentual rate per year. This shows an estimate that on average the unemployment rate is at 89.56% from the year prior. Estimating a possible trend that the value of the year 2022 will decrease by 1.043%.

#### 4.1.2 Hypothesis testing and basic statistics

The set of hypothesis statements for this dataset are as following:

$H_0$  ... there is no significant relationship between the set values

$H_1$  ... there is a significant relationship between the set values

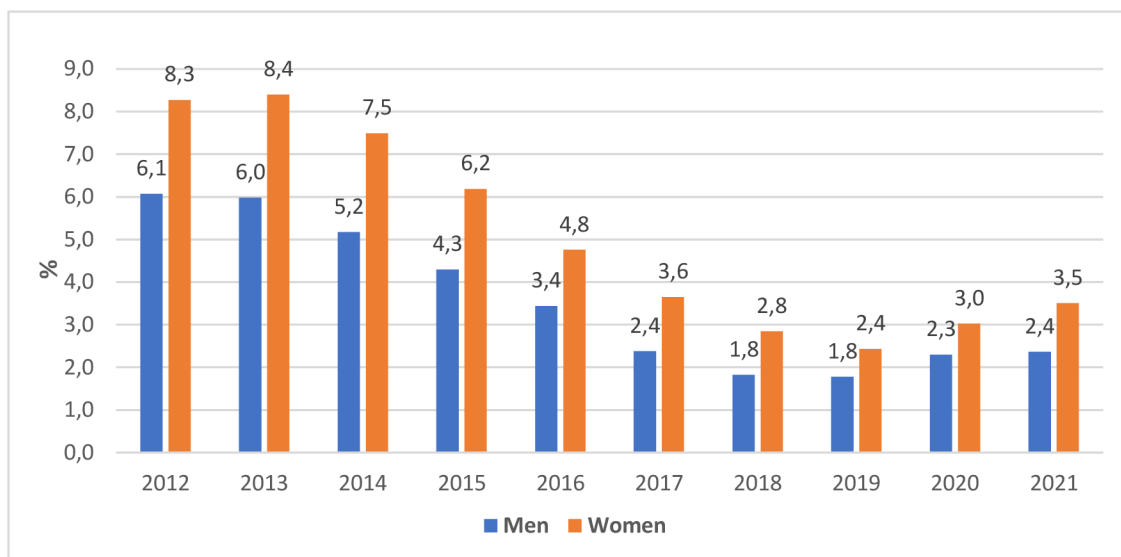
The P-value determined is larger than: 0.001, but it is lower than the alpha (0.05) therefore  $H_0$  is rejected and  $H_1$  stands. The basic statistical characteristics of the dataset have: a maximum value of 7, a minimum value of 2.1, the mean is equal to 4.21, standard deviation of this dataset is at 1.9576, standard error is at 0.619. These statistical results show that the data set does not have any major abnormalities that would be concrete to one specific year and thus would be breaking the trend. The fixed base index is used to calculate the change between the original year which in this case is 2012 and the present year which is 2021. The result was equal to 0.41428, meaning the unemployment rate in 2021 is 41.42% of what it was in 2012. While there is a noticeable shift from decline to a slight rise in the pandemic year of 2020, the curve is already beginning to straighten out in 2021. This can be seen by using the chain base index:

$$y = \frac{\text{Present year}}{\text{year prior}}$$

The chain base index calculation resulted in 1.1153, for the year 2021 and 2020. This result shows a slow increase by 11.53% and leads to the conclusion that the unemployment percentages of Czech Republic are beginning to stabilize as if compared to the growth during the pandemic year which was equal to 1.23809 which was an equivalent to a 23.8095% increase since 2019. It can be expected that the rates will plateau in the following year and then begin to return to a value similar to that of the year before the impact of the pandemic which is the main external force that pushed the rates up in the first place.

## 4.2 Development of unemployment between men and women

**Figure 6: Unemployment among women and men in the Czech Republic, age 15–64, period 2012–2021 (in %)**



Source: CZSO, own processing, 2022

As it can be seen in Figure 6, in year 2013 and 2014, the unemployment difference between men and women was the widest. In 2013, the unemployment among women were by 2.4 percentage points higher than males. In 2014 it was by 2.3 percentage points. The smallest difference among women and men was observed in years 2019 and 2020 and the difference was by 0.7 percentage points in both cases. In observed years overall unemployment is more severe for women since in all years the percentage values were higher. Unemployment had been decreasing in the first couple years however due to pandemic crisis it began to increase.

**Table 2: Unemployment among women and men in the Czech Republic, age 15–64, period 2012–2021 (in %)**

Year	Men	Women
2012	6.1	8.3
2013	6.0	8.4
2014	5.2	7.5
2015	4.3	6.2
2016	3.4	4.8
2017	2.4	3.6
2018	1.8	2.8
2019	1.8	2.4
2020	2.3	3.0
2021	2.4	3.5

Source: CZSO, own processing, 2022

The correlation coefficient between the unemployment of men and women in period from year 2012–2021 is equal to  $r = 0.99652$ . Therefore, the linear relationship measured between men and women in their unemployment is considerably strong indicating that the rates for men and women change similarly throughout the years listed above.

The correlation coefficient may be affected by trend throughout the years, in order to make sure the trend is not affecting the numbers and thus the output a theoretical dataset had to be created from the actual data, using linear regression equations. For both men and women:

$$\text{Men: } y' = 1038.3 - 0.5131x$$

$$\text{Women: } y' = 1433.9 - 0.7086x$$

From the actual dataset the coefficient of determination can be calculated. The percentage of explained data for men is  $R^2 = 83.63\%$ , while for women it is  $R^2 = 84.37\%$ . In both cases the percentage has a high explanation rate.

**Table 3: Unemployment among women and men in the Czech Republic, age 15–64, period 2012–2021. Theoretical values.**

Year	Men	Women
2012	1035.183	1428.038
2013	1035.23	1427.947
2014	1035.646	1428.59
2015	1036.096	1429.517
2016	1036.535	1430.531
2017	1037.079	1431.317
2018	1037.365	1431.883
2019	1037.389	1432.175
2020	1037.12	1431.755
2021	1037.088	1431.415

Source: CZSO, own processing, 2022

**Table 4: Unemployment among women and men in the Czech Republic, age 15–64, period 2012–2021. Residual**

Year	Men	Women
2012	-1029.11	-1419.77
2013	-1029.25	-1419.55
2014	-1030.47	-1421.1
2015	-1031.8	-1423.33
2016	-1033.09	-1425.78
2017	-1034.7	-1427.67
2018	-1035.54	-1429.04
2019	-1035.61	-1429.74
2020	-1034.82	-1428.73
2021	-1034.73	-1427.91

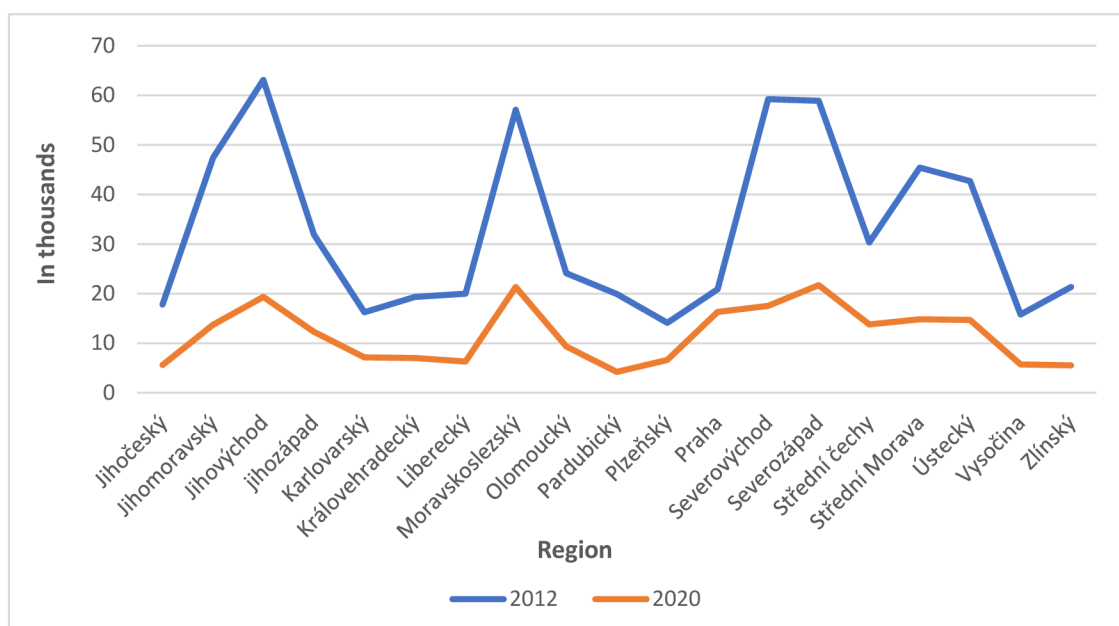
Source: CZSO, own processing, 2022

The correlation coefficient without trend resulted in the same value as it was in the correlation of the actual data  $r = 0.99652$ . This means that the data is not affected by the trend, however it is affected by the situation of each specific year. The result shows that there is a very strong positive correlation between the two data sets of men and women.

### 4.3 Age and education level in the regions of Czech Republic

The unemployment varies from region to region due to different concentration of vacancies and regions size and its population. Certain regions significantly contribute to the Czech's unemployment rates size more than the others. The Czech Republic has in total of 14 regions including capital city Prague. In addition to that, there are several divisions of those regions which makes in total of 19 observed areas.

**Figure 7: Unemployment in all regions. Year 2012 and 2020 comparison**



Source: CZSO, own processing, 2022

As it can be seen in the Figure 7, overall, the unemployment among all the regions has decreased in comparison to the year 2012. Region entitled Jihovýchod had the highest unemployment back in 2012 at 63.1 thousand individuals that are unemployed. From all the regions, Plzeňský had the lowest unemployment in year 2012 equal to 14.1 thousand people being unemployed.



**Table 5: Growth of unemployment since year 2012 in different regions**

<b>Region</b>	<b>Growth since 2012</b>
Jihočeský	-0.685393258
Jihomoravský	-0.710970464
Jihovýchod	-0.694136292
jihozápad	-0.614420063
Karlovarský	-0.561728395
Královehradecký	-0.637305699
Liberecký	-0.685
Moravskoslezský	-0.626970228
Olomoucký	-0.614107884
Pardubický	-0.788944724
Plzeňský	-0.531914894
Praha	-0.220095694
Severovýchod	-0.704391892
Severozápad	-0.631578947
Střední Čechy	-0.544554455
Střední Morava	-0.674008811
Ústecký	-0.655737705
Vysočina	-0.639240506
Zlínský	-0.741784038

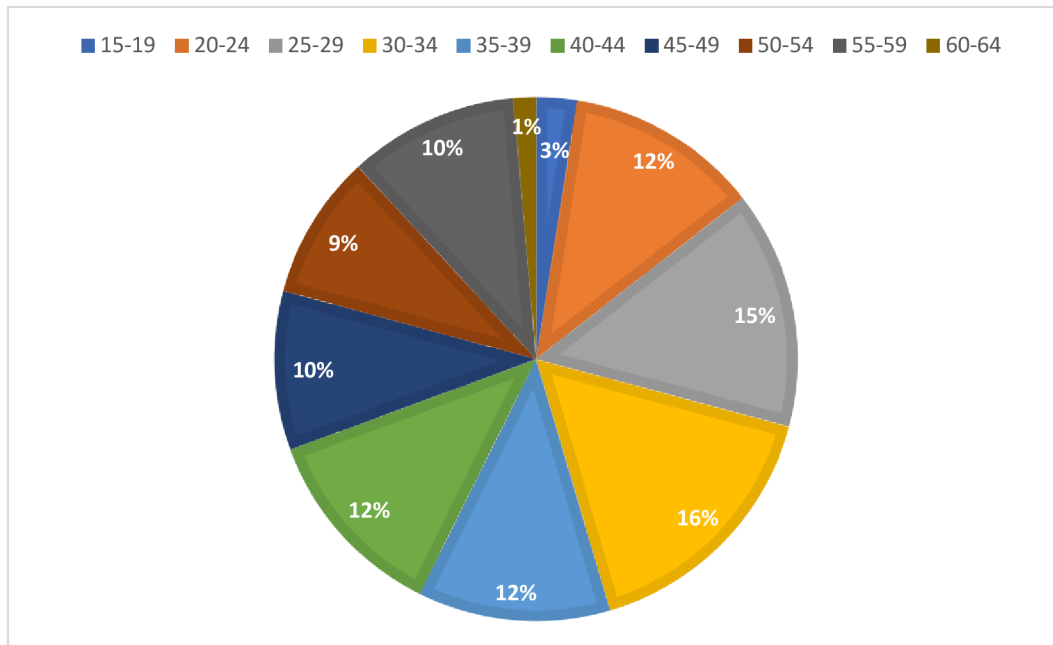
Source: CZSO, own processing, 2022

From Figure 8, it can be seen that the growth rate for all of the regions is in the negative which means that all of the areas have reduced their unemployment in year 2020 compared to the year 2012. Capital city of the Czech Republic Prague has had the lowest change in unemployment in the last 9 years compared to the rest of the regions compared. In contrast the region Pardubický has positively decreased its unemployment the most from all the regions at -0.7889 growth rate.

The correlation between the years 2012 and 2020 among all observed regions listed in Figure 7 is equal to  $r = 0.88971$ . This shows a strong positive correlation for the data of all the regions, leading to possible assumptions that when the unemployment of the Czech Republic changes, the regions will be impacted accordingly in similar fashion.

## 4.4 Unemployment by age groups

Figure 8: Unemployment in Czech Republic based on age categories



Source: CZSO, own processing, 2022

Figure 8 displays overall unemployment of the Czech Republic divided into age groups. The data for the age group of 65 and above is not included in the figure 8 pie chart as that age range contains only empty values. The data shows a consistent trend of the fact that most of the unemployed population is located within the 30 to 45 age range. The closer to the youngest group of 15 to 19 years the lower the number of people in that situation, the same factor applies to the upper age group of 60 to 64 which has only 1%. The most common age range in the end is 30–34 with 16%. Out of all the age groups, the 4 groups located in age ranges of 25–44 have a total of 114.8 thousand people, while the surrounding 7 groups ranging 15–24 and 45–64 have a total of 94.2 thousand people.

## Conclusion

When putting Czech Republic in the world scale it is a country with one of the lowest unemployment rates. Unemployment in the Czech Republic during observed period from year 2012 to year 2020 had undergone two different phases of its cycle. Unemployment was consistently decreasing, and situation was significantly improving as the economies were able to rise along with increase of GDP and that from the first observed years up till year 2019. In this year the share of unemployed people from total population equal to 2.07%. It was the very lowest recorded during observed period. In contrast the highest value was reported in years 2012 and 2013, that being equal to 7.05 for year 2013 and 7.04 for year 2012. However, unemployment in the country was not only decreasing. From year 2020 onwards it began to increase yet again. The biggest impact on unemployment certainly had COVID-19. As many businesses due to national regulations were forced to close down not everyone was prepared for such event with sufficient savings and became unemployed. In addition, many business owners were forced to close their businesses down due to lack of demand.

Looking at unemployment in more detail such as age category. According to data from observed years the unemployment affects mostly people from 25-35 years. Unemployment seems to affect more female individuals rather than men as in many cases they take the role of the housewife. Helpful solution to case of this category would be a requalification.

In year 2012 the area with most unemployed people was Jihovýchod which is basically Vysočina and Jihomoravský region together. Value was 63.1 thousand unemployed. And the lowest value obtained during that year was 14.1 thousand unemployed from Plzeňský region. In year 2020 the region with highest unemployment was Moravskoslezský with 21.3 thousand people unemployed. In the exact same year, the smallest value was recorded in Pardubický region with only 4.2 thousand people.

Unemployment is a problem that affects every country. With an appropriate strategy and by a correct analysis of the society and its current state, it can help reduce the unemployment of the country.

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