

**CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE**

**Faculty of Economics and Management**

**Department of Economics**



**Bachelor Thesis**

**UNEMPLOYMENT AND INFLATION IN THE  
CZECH REPUBLIC IN COMPARISON WITH THE  
EUROPEAN UNION**

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**CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE**

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Faculty of Economics and Management

# **BACHELOR THESIS ASSIGNMENT**

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Thesis title

**Unemployment and inflation in the Czech Republic in comparison with the European Union**

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#### **Objectives of thesis**

The objective of this thesis is assessing the unemployment and inflation, and the factors that influence them.

#### **Methodology**

The main methods of the work are analysis and synthesis of data and information obtained mainly from the websites Czech Statistical Office and Eurostat.

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Friedman, M. The Role of Monetary Policy. *The American Economic Review*, 1968 March, No. 58, pp. 1-17.

PHELPS, E.S. Phillips curves, Expectations of Inflation and Optimal Unemployment over Time. *ECONOMICA*, 1967, pp. 135.

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## **Declaration**

I declare that this bachelor thesis “Unemployment and inflation in the Czech Republic in comparison with the European Union” I wrote independently under direction of supervisor of my bachelor thesis using literature and other information sources, which are quoted in the work and listed in the bibliography at the end of the work. As an author of this bachelor thesis I claim, that I did not breach copyright of the third person, when I wrote this work.

14.03.2014 in Prague

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## **Acknowledgment**

I would like to express my sincere gratitude to my supervisor Ing. Mansoor Maitah, Ph.D. for his valuable advice and professional assistance throughout my work.

## Summary

This bachelor thesis deals with analysing the evolution of unemployment and inflation in the Czech Republic. Attention is paid to identification of the major determinants that affect these macroeconomic indicators. The thesis is divided into two main parts, theoretical and practical. Theoretical part of the work represents a brief introduction, focusing on the basic concepts of the topic and explains the necessary context for understanding the issue, using the opinions of the most important world economists. In the practical part there are made analysis with specific data for the Czech Republic in the area of unemployment and inflation and achieved values are contrasted with the values measured in the European Union. The necessary structural research is performed so as to reach all objectives.

**Key words:** unemployment, inflation, economic activity, consumer price index, nominal income, real income.

## Souhrn

Bakalářská práce se zabývá analýzou vývoje nezaměstnanosti a inflace v České republice. Pozornost je věnována identifikaci hlavních determinant, které ovlivňují tyto makroekonomické ukazatele. Práce je rozdělena do dvou hlavních částí, teoretické a praktické. Teoretická část práce představuje stručný úvod, se zaměřením na základní pojmy tématu a vysvětluje potřebné souvislosti pro pochopení dané problematiky, pomocí názory nejvýznamnějších světových ekonomů. V praktické části je následně proveden rozbor konkrétních dat pro Českou republiku v oblasti nezaměstnanosti a inflace a dosažené hodnoty jsou v kontrastu s hodnotami naměřenými v Evropské unii. Jsou provedeny potřebné strukturální analýzy tak, aby byly naplněny veškeré cíle práce.

**Klíčová slova:** nezaměstnanost, inflace, ekonomická aktivita, index spotřebitelských cen, nominální důchod, reálný důchod

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## **1 Introduction**

The goal of any economy is to achieve maximum production, minimum unemployment and a stable price level. The amount of production can be measured using the indicators of the gross domestic product, gross national product and as well as using different indicators. Unemployment can be measured in absolute values, but more often it indicates for greater explanatory power of the percentage unemployment rate. The stability of the price level is then evaluated using the inflation, which is expressed by the annual increase in prices.

This paper deals with two of the three mentioned macroeconomic topics, which are unemployment and inflation. In relation to these indicators thesis includes part of the Phillips curve, which explores the relationship and mutual influence of the unemployment and inflation.

The overview of the solved issues summarizes the most important findings and theoretical basis of the defined area. The practical part shows the values of inflation and unemployment in the Czech Republic, analyses its structure as well as it compares the average of the European Union.

## 2 Objectives and research questions

The objective of this thesis is assessing the unemployment and inflation, as the two basic problems of the economic policy and the factors that influence them. Another objective is consists of valuing and describing the relationship between unemployment and inflation known as the Phillips curve.

### Research questions:

- What is the development trend of unemployment in the Czech Republic?
- What is the structure of unemployment in the Czech Republic in terms of regions?
- What is the structure of unemployment in the Czech Republic in terms of age?
- What is the structure of unemployment in the Czech Republic in terms of education?
- What is the unemployment rate in the European Union in comparison with the Czech Republic?
- What is the development trend of inflation in the Czech Republic?
- What is inflation in the European Union in comparison with Czech Republic?

## 3 Methodology

The thesis is divided into theoretical and practical parts. The first part of the thesis represents a brief description of both analyzed variables and their relationship, using the compilation method. In the practical part there are used descriptive and comparative methods of research. Another methods that were applied are analysis and synthesis of data. Used information was obtained mainly from the website of the Czech statistical office, ministries, the Czech national bank and Eurostat. These information were not only analyzed and summarized, but also clear graphically expressed. Methods were used in the case of using time series and an area as comparing economy of the Czech Republic with the European Union.

## 4 Theoretical part

### 4.1 Unemployment

Unemployment is a problem for the economy and society.

For the economy it is the loss of valuable resources. Every increase in unemployment shows that the economy throws away goods and services that could make the unemployed. Economic losses in the period of unemployment are high losses in the modern economy. Far outweigh the microeconomic evaluation inefficiency existence of monopolies, tariffs and quotas.<sup>1</sup>

For the society is a problem due to falling revenues and connected with them problems. Economic losses from unemployment are undoubtedly significant, associated with monetary units, but it does not compare with the psychological and social difficulties related to long periods of involuntary unemployment. Experience again and again confirms that unemployment brings the personal crisis.

#### 4.1.1 Measurement of unemployment

Unemployment is measured by the only one way and that is by using simple formula:

$$\text{Unemployment Rate} = \left( \frac{\text{Unemployed}}{\text{Labour Force}} \right) * 100$$

In connection with this formula Mankiw (1999) explains the concept labour force as the sum of employed and unemployed persons. In calculating the unemployment rate is therefore not considered economically inactive persons (students, pensioners, women on maternity leave, voluntarily unemployed and others).

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<sup>1</sup> HALL, R. E., TAYLOR, J. B. *Macroeconomics*

### 4.1.2 Natural rate of unemployment

Structural and frictional unemployment forms the natural unemployment rate.<sup>2</sup>

The natural rate of unemployment is the rate of unemployment when the labour market is in equilibrium. There exist the difference between those who would like a job at the current wage rate and those who are willing and able to take a job.<sup>3</sup>

The natural rate of unemployment is caused by two general determinants. The first is that the job search takes time. The second determinant is the rigidity of nominal wages. Real wages cannot quickly enough or at all drop to the equilibrium wage that clears the labour market, causing excess labour supply over demand for labour. This type of unemployment is sometimes referred to as wait unemployment, or unemployment due to "wait" on the job.

### 4.1.3 Causes of unemployment

Unemployment is caused when someone is laid off, fired or quits and is still looking for a job. This type of natural unemployment always occurs, even in a healthy economy. If someone retires, goes back to school or leaves the work force to take care of children or other family member that is not unemployment. Also, if someone gives up looking for work, they are also not counted as unemployed.

Sometimes unemployment is a result of advanced technology, such as computers or robots, which replaces worker tasks with machines. If the workers are not retrained, they may not have the skills needed to get a new job. This is known as structural unemployment.

Unemployment can also be caused by job outsourcing, when a company moves its manufacturing or call centres to another country where labour costs are cheaper.

Large scale unemployment is caused when consumer demand slows enough that businesses lose too much profit. If they don't expect sales to pick up anytime soon, they then must lay off workers. This usually happens during the recession phase of the business cycle.

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<sup>2</sup> HOLMAN, R. *Makroekonomie, středně pokročilý kurz*. 1<sup>st</sup> edition

<sup>3</sup> BRČÁK, J., SEKERKA B. *Makroekonomie*

#### 4.1.4 Types of unemployment

In neoclassical economics, the unemployment is divided into three basic types: frictional, structural and cyclical unemployment.

##### **Frictional unemployment**

Frictional unemployment is a known type of unemployment that arises from the fact that people from different causes are leaving their jobs and are looking for a new one. This search might take some time, for example because of poor information on the labour market.<sup>4</sup>

Frictional unemployment is therefore associated with the movement of workers. It is the unemployed who were laid off from work, because companies are constantly excluding workers, either because of the crisis, organizational changes, and technological progress. For unemployed there are many reasons to leave their jobs, for example, searching for a totally other kind of work, or better-paid work, or moving and looking for work in another city. Frictional unemployment is also related to the entry of new workers into the labour market when graduates are seeking a new job, or entering to the labour market immigrants or housewives.<sup>5</sup>

Frictional unemployment is often referred to as voluntary, as poor awareness on the labour market and the time required to look for work are not considered significant. In the case of frictional unemployment it is not about the lack of vacancies, but it is more about a search for vacancies. If there would be a shortage of vacancies it relates to cyclical unemployment. When vacancies do not match the professional character or regional distribution of vacancies, it applies to a structural unemployment.

##### **Structural unemployment**

There are two ways to think about structural unemployment. One way is that structural unemployment occurs because some labour markets have more workers than there are jobs

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<sup>4</sup> BRČÁK, J., SEKERKA B. *Makroekonomie*

<sup>5</sup> HELÍSEK, M. *Základy makroekonomie*. 1<sup>st</sup> edition

available, and for some reason wages don't decrease to bring the markets into equilibrium. Another way to think about structural unemployment is that structural unemployment results when workers possess skills that aren't in high demand in the marketplace and lack skills that are in high demand. In other words, structural unemployment results when there is a mismatch with workers' skills and employers' needs. Structural unemployment is thought to be a pretty significant problem, mainly because structural unemployment tends to be largely of the long-term variety and retraining workers is not a cheap or easy task. Structural unemployment may be also subject to rigidities in nominal rates down, which is caused by the enactment of a minimum wage. If enacted minimum wage higher than the equilibrium wage in the labour market, especially in the case of unskilled labour, leads to structural unemployment of these workers.<sup>6</sup>

### **Cyclical unemployment**

It's probably not surprising that unemployment is higher during recessions and depressions and lower during periods of high economic growth. Because of this, economists have coined the term cyclical unemployment to describe the unemployment associated with business cycles occurring in the economy. Cyclical unemployment occurs during recessions because, when demand for goods and services in an economy falls, some companies respond by cutting production and laying off workers rather than by reducing wages and prices. When this happens, there are more workers in an economy than there are available jobs, and unemployment must result.

As an economy recovers from a recession or depression, cyclical unemployment tends to naturally disappear. As a result, economists usually focus on addressing the root causes of the economic downturns themselves rather than think directly about how to correct cyclical unemployment in and of itself.<sup>7</sup>

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<sup>6</sup> HELÍSEK, M. *Základy makroekonomie*. 1<sup>st</sup> edition

<sup>7</sup> HOLMAN, R. *Makroekonomie, středně pokročilý kurz*. 1<sup>st</sup> edition

## **Seasonal Unemployment**

Seasonal unemployment is when a person is unemployed because certain types of jobs are only available at certain times of the year. It is simply caused by decreased demand for goods or services during particular times of the year. Seasonal unemployment is the most predictable type of unemployment because it happens each year.<sup>8</sup>

## **Voluntary and involuntary unemployment**

Voluntary unemployment is a condition where people would rather prefer leisure to employment. That voluntarily unemployed may have a job offer, but looking for another job with higher remuneration. They are not willing to accept a job unless wage higher than the respective sector market. Voluntarily unemployed are convinced that the potential harm to the free time when employment is greater than any reward for their work. Voluntary unemployment may have short-term character, where the unemployed after a certain time choose to work for a lower wage than they expect, or to retrain and find work in another market. Some are no longer willing to work for lower wages than they expect, and live on welfare benefits.

In contrast, the involuntarily unemployed are willing to work for a wage that prevails in the market or even at a lower wage, but not enough for them job opportunities. One of the causes are inflexible wages. The market is higher than the equilibrium wage rate. If wages fell to the equilibrium level, it would be that the work those who are willing to work on the balance of wages. Firms would also be willing to hire more workers at the equilibrium wage. If the wage rate dropped, the employment would increase and the unemployment would be changed to the voluntary, would work only those who is really willing to work for a given wage. However, the decline in wages prevents many barriers. It is a union that prevents the decline in wages, or the enactment of a minimum wage. Enactment of minimum wage causes problems especially in low-skilled occupations where there are low wages. Employees should also work for lower wages, but the employer cannot offer more.<sup>9</sup>

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<sup>8</sup> HOLMAN, R. *Makroekonomie, středně pokročilý kurz*. 1<sup>st</sup> edition

<sup>9</sup> HALL, R. E., TAYLOR, J. B. *Macroeconomics*

## **Long-term unemployment**

Not only involuntary unemployment is associated with a number of problems. Another negative unemployment is long-term unemployment. Thus, analysing of unemployment is considered by not only the quantity but also the duration. Therefore, even a low rate of unemployment can be very negative if it consists of long-term unemployed. Duration of unemployment is calculated using two methods. One of them is the time between registration at the office and the date of the payment. The second method is to calculate the duration of unemployment, as the time elapsed between registration at the office and the exclusion of the unemployed from registration. Long-term unemployment is defined by several factors, most are unemployed for more than one or two years.<sup>10</sup>

### **4.1.5 The impact of unemployment**

Unemployment as negative and undesirable phenomenon raises a number of other negative impacts. There are economic, social and, for sure, individual impacts.

#### **Economic impact**

Any increase in unemployment brings negative impact to the economy of the certain state. The biggest problem is the loss of macroeconomic product. It is a fact that the actual product is lower than the potential, a product that would be obtained using all available resources. The unemployed do not contribute to the production of goods and services, and does not participate in the creation of the actual product. This loss can be estimated based on Okun's law, which is mentioned below. Potential product is equal to the natural product, if the real unemployment rate is equal to the natural rate of unemployment. If the real unemployment rate is higher than the potential, the economy does not use all options and there will be a loss of macroeconomic product. This size is estimated using mathematical methods.<sup>11</sup>

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<sup>10</sup> BLANCHARD, O. *Macroeconomics*

<sup>11</sup> BROŽOVÁ, D. *Společenské souvislosti trhu práce*. 1<sup>st</sup> edition



Other negative impacts include utilization of production factors. Labour factor in involuntary unemployment is used not fully and thus remains outside the process. Other factors are thus reduced. The unemployed does not receive wages, benefits only, due to the amount but is forced to reduce consumption and also have lower savings. Therefore decreasing supply of loan capital for investment. If less power consumption and less investment again reduces the product.

The state also loses tax revenue. Unemployed does not pay income tax and firms that result in reduced consumption produce lower quantities of goods and services, have lower profits. That is why the tax on corporate profits is lower.

State expenditures in a state due to high unemployment are very high. The state must pay unemployment benefits and other social security payments.

### **Social impact**

Unemployment has a detrimental effect not only on economics but also on society and the individuals. The unemployed are exposed to a number of pressures that have an adverse effect not only on their economic status, but also social and psychological.

Unemployed cannot practice their knowledge and experience and therefore lose own skills. This leads to a degradation of human capital, which is a major determinant of resource economics. The problem of loss of qualification can be included as the economic impacts, as due to the lower value of human capital loses the entire economy, as well as to the social impact and workers themselves suffer psychologically and socially.<sup>12</sup>

The big problem is, obviously, long-term unemployment, the consequences of which can affect unemployed spreading negative effects. Unemployed gradually loses his job and daily habits, this causes to changes in lifestyle. There is also should be noted the negative impact of unemployment on the human psyche, thereby induced potential psychosomatic disorders. For the unemployed leads to a personal crisis, losing its value not only in own eyes, but also in the eyes of their loved ones, reducing not only its social position in society, but also to the family. The unemployed is due to these problems closer to the social pathologies such as crime, alcoholism, gambling and more.

Among the undesirable social behaviour belong social parasitism. It mainly affects long-

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<sup>12</sup> BROŽOVÁ, D. *Společenské souvislosti trhu práce*. 1<sup>st</sup> edition

term unemployed with no or very low qualifications for which wages would be consistent with their achieved social benefits. In this situation for this group of people it is preferable to live on social benefits and sometimes gain revenue market activity of the economy. Social parasitism is a scourge to the society and economy, so it is necessary to actively prevent it. Among the measures necessary to include are social unemployment benefits that would be lower than the minimum wage. It is not only the actual amount of social benefits but also the duration of providing those benefits, because social support is intended to serve to overcome the period of unemployment, not to replace the wages.

## 4.2 Inflation

### 4.2.1 Definition of inflation

Inflation defines as an increase in the price you pay or a decline in the purchasing power of money. In other words, price inflation is when prices get higher or it takes more money to buy the same item. Interest rates are increased to moderate demand and inflation and they are reduced to stimulate demand.

Holman defines inflation as “...long-term and continuous increase in the price level, the weakening of the real value of money and specific national currency against the goods and services that the typical consumer buys a daily basis.” It is a process that is associated with excessive emission of money and in turn leads to a decline in their purchasing power. When it comes to consumer price inflation, then there is the fact that buying the same amount of goods and services consumers need more of currency units.<sup>13</sup>

### 4.2.2 Deflation

Opposite of inflation is deflation, which is defined as a fall in the price level of all prices of goods and services.<sup>14</sup> The inflation rate in this case is negative values. Theoretically, deflation can be defined as a fall in prices due to the shift of the aggregate supply curve to the right. This means that the current increase in product; decline in prices should encourage consumers to more purchases. The decline in prices is not always a response to deflation, it can be the result of a growing economy and increasing living standards to increase the demand for money.

In a period of inflation the price and wages do not grow equally and thus leads to changes in relative prices. All problems that produces inflation, bring a sense of uncertainty,

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<sup>13</sup> HOLMAN, R., *Economie*

<sup>14</sup> HOLMAN, R., *Economie*

creating an uncertain environment for the economic activity. Unpredictability about the significant rise in prices leads to a redistribution of wealth, economic entities have only implemented short-term investments and try as much as possible to fight against inflation. For this reason, the cost of acquiring capital increase.<sup>15</sup>

### 4.2.3 The measurement of inflation

For the central bank is important especially establishing its inflation target. To understand and could make a good decision regarding inflation, for the central bank its useful to know about what kind of inflation is. Inflation currently can be measured in several different ways.

#### **Consumer price index (CPI)**

The most important indicator of the price development and the most meaningful measurement for the society is the consumer price index (CPI). It is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. The CPI is calculated by taking price changes for each item in the predetermined basket of goods and averaging them; the goods are weighted according to their importance. Changes in CPI are used to assess price changes associated with the cost of living.<sup>16</sup>

Calculating the value of the consumer price index is done using the Laspeyres price index:

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<sup>15</sup> BERNANKE, B. S., *Inflation Targeting: Lessons from the International Experience*

<sup>16</sup> HOLMAN, R., *Ekonomie*

$$I = \frac{\sum \frac{p_1}{p_0} \cdot p_0 q_0}{\sum p_0 q_0} \cdot 100$$

- $I$  is the index of the reference period relative to the base period
- $p_1$  is the price of goods or services in the current period
- $p_0$  is the price of goods or services in the base period
- $p_0 q_0$  is a constant weight, expenditure of households of goods in the base period.

Through this calculation is obtained price level for a specific period in relation to a base period. To measure rates of inflation between the two periods (for example, annual inflation), it is necessary values for specific years put into the original formula for calculating inflation.<sup>17</sup>

### **Production price level (PPI)**

The principle of producer price index is exactly the same as the consumer price index. Calculation formula can be used in the same form. The essential difference between these indexes is in a basket items. Within this index tracks changes in price levels in each sector. In reality, therefore, a few indexes. Most often Statistical Office include, for example:

- price index of agricultural producers
- price index of industrial producers
- price index of construction work and others (PAVELKA, 2007).

Producer price index actually express the structure of the CPI. Any changes in the price level using the producer price index is then reflected in the CPI. However, using the PPI to

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<sup>17</sup> BERNANKE, B. S., *Inflation Targeting: Lessons from the International Experience*

identify which sectors, possibly products most affect the consumer price index and also the whole inflation.

### **GDP deflator**

Gross domestic product is an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). The sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services, or the sum of primary incomes distributed by resident producer units (HELISEK, 2002).

$$GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} \times 100$$

#### **4.2.4 The consequences of inflation**

The issue of inflation affects income and wealth. The unexpected inflation rate leads to a redistribution of income towards borrowers.<sup>18</sup> Once inflation lasts longer, market gradually adapts and begins to use debt instruments or in other words a floating rate, which is constantly responding to changing market interest rate, thus eliminates some of the problems - such as the exchange price lists. Total price growth raises nominal wage growth, which in any economic system with progressive taxation leads to an increase in personal income tax. This situation can be avoided by using the term indexation. Also, in a

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<sup>18</sup> SAMUELSON, P. A., NORDHAUS, W.D. *Economics*.

period of inflation can be expected decline in the fair value of transfer payments that should be indexed annually.<sup>19</sup>

Inflation distorts pricing policy, affects the information sphere. For the final consumers basic information is the price. Pricing information about various goods consumers analyzing and comparing in the case of slow response to rapid inflation, consumers can pay for selected product more than is needed. Sellers take an advantage of this situation and quickly changing prices. Then for the consumer is very difficult to compare rapidly changing rates.<sup>20</sup>

The last important result is the effect of inflation on the cost of business entities. Costs connected with the revaluation of the value of products or materials are associated with the change of the structure of the business assets.<sup>21</sup>

Inflation affects all economic entities. The main negative consequence of inflation is the uncertainty that comes in the case of significant fluctuations in the price level. Another consequence of high inflation is that people begin to save less due to the unpredictability and expecting very positive future. The main reason is that inflation distorts everything, including the purchasing power of savings. The price level may lead to changes in patterns of consumption and affect the import and export of goods. But inflation also has positive consequences - but only for borrowers, in that case there is a large decline in the value of loans.

#### 4.2.5 Types of inflation

Currently, there are three basic types of inflation: demand-pull inflation, cost-push inflation and inertial inflation. These types differ from each other by what inflationary impulses resulting in their induction.

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<sup>19</sup> BLANCHARD, O., *Macroeconomics*

<sup>20</sup> BLANCHARD, O., *Macroeconomics*

<sup>21</sup> BLANCHARD, O., *Macroeconomics*

## **Demand-pull inflation**

Demand-pull inflation is based on increasing in some components of aggregate expenditure, located on the demand side. This is the so-called demand shock, which causes on growing in the aggregate spending (government spending, consumption, investment and net export). Every economy has labour, land and capital, which can use in a specified period. Using this well-known combination of production factors in collaboration with technology allows to find the maximum of output level. The growth of aggregate demand has a positive effect on the level of output and employment. If the economy is at or below the level of potential output, it is leading to a demand-push inflation. Growth in demand is due to increased spending on the purchase of goods with a limited offer. When the border of the production possibility exceeds, begins economic changes and price inflation.<sup>22</sup>

### **Causes of demand-pull inflation:**

- Tax reduction increases aggregate demand, which may affect demand inflation
- Increasing wages, which may reflect the total costs
- Holding interest rates, which further leads to cheaper loans and increase investment expenditures
- Imperfect competition in the form of monopoly or oligopoly, which has an impact on market prices
- Political events that may cause higher prices of raw materials. The increase in costs that need to move to lower-quality sources of raw materials or energy
- Income growth, which is not properly supported by labour productivity.<sup>23</sup>

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<sup>22</sup> HOLMAN, R., *Ekonomie*

<sup>23</sup> HELÍSEK, M., *Makroekonomie – základní kurs*. 2<sup>nd</sup> edition



## **Cost-push inflation**

Cost push inflation is inflation caused by an increase in prices of inputs like labour, raw material, etc. The increased price of the factors of production leads to a decreased supply of these goods. While the demand remains constant, the prices of commodities increase causing a rise in the overall price level. This is in essence cost push inflation.<sup>24</sup>

The growth of price level is caused by the negative consequences of the supply side of the market. The real product is below the required level of potential output.

The overall price level increases due to higher costs of production which reflects in terms of increased prices of goods and commodities which majorly use these inputs. This is inflation triggered from supply side because of less supply. The opposite effect of this is demand pull inflation where higher demand triggers inflation.

Apart from rise in prices of inputs, there could be other factors leading to supply side inflation such as natural disasters or depletion of natural resources, monopoly, government regulation or taxation, change in exchange rates and other. Generally, cost push inflation may occur in case of an inelastic demand curve where the demand cannot be easily adjusted according to rising prices.

### **Causes of cost-push inflation:**

- Higher price of commodities. A rise in the price of oil would lead to higher petrol prices and higher transport costs. All firms would see some rise in costs. As the most important commodity, higher oil prices often lead to cost push
- Imported inflation. A devaluation will increase the domestic price of imports. Therefore, after a devaluation we often get an increase in inflation due to rising cost of imports.

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<sup>24</sup> HOLMAN, R., *Makroekonomie*

- Higher wages. Wages are one of the main costs facing firms. Rising wages will push up prices as firms have to pay higher costs (higher wages may also cause rising demand)
- Higher taxes. Higher VAT and excise duties will increase the prices of goods. This price increase will be a temporary increase.
- Higher food prices. In western economies food is a smaller % of overall spending, but in developing countries, it plays a bigger role.<sup>25</sup>

### **Other classification**

There are other methods of classification of inflation.

According to the expecting:

- Expected or anticipated (economic entities include it in calculations and decision-making processes)
- Unexpected or not anticipated (economic entities do not include it in calculations)<sup>26</sup>

According to the impact on the relative prices:

- Balanced (does not change the relative prices of goods and services, all prices rise at the same rate)
- Unbalanced (changing relative prices, prices are rising in different rates)<sup>27</sup>

According to the rate of growth of the price level:

- Creeping or mild inflation (prices are rising slowly and with regard to the annual rate of inflation)
- Walking inflation (walking inflation is little more faster inflation than the creeping inflation)

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<sup>25</sup> HOLMAN, R., *Makroekonomie*. 1<sup>st</sup> edition

<sup>26</sup> GROLIGOVA, I., MANDELÍK, P., *Makroekonomie*

<sup>27</sup> GROLIGOVA, I., MANDELÍK, P., *Makroekonomie*

- Galloping inflation (when the price rise happens in a faster rate, than walking inflation)
- Hyperinflation (prices rise every moment and there is no limit to the highest to which the prices might rise)<sup>28</sup>

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<sup>28</sup> GROLIGOVA, I., MANDELÍK, P., *Makroekonomie*

### 4.3 Phillips curve

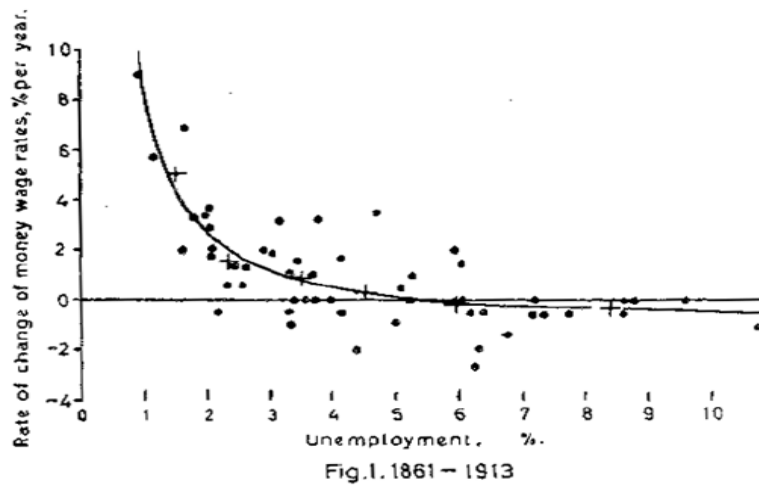
Phillips curve in macroeconomic theory generally known concept. The object of its investigation is the dependence of the rate of unemployment on inflation, and vice versa. This dependence was first declared in 1958 by the New Zealand economist A. W. Phillips. This dependence is still called by his name, even though from that time have been made several changes from many authors.

#### **Original Phillips curve**

Phillips (1958) first pointed out the possible relationship between inflation and unemployment. His model, however, did not use price inflation, but used wage inflation. Therefore examined the relationship between wage increases and unemployment. In his article analyzed the data of Great Britain years 1861-1957. This analysis is comparing the labour market and the market for goods and services. It states that when there is low unemployment thus a high demand for labour, companies increase wage to obtain qualified workforce. Conversely, when unemployment is high, companies are trying to reduce wages. Workers are willing to reduce their wages very slowly and gradually. This indicates the strong nonlinearity, as in the case of increased demand for labour, wages increased sharply, while the decline in wages decrease slowly.

The graph shows the original Phillips curve compiled for the years 1861 to 1913. From this curve it is implied that at zero growth wages unemployment rate is expected to reach 6%. Zero growth in wages is not only due to increasing labour productivity unrealistic. Therefore, also dealt with the level of unemployment at a 2% increase in labour productivity and a 2% increase in wages. Under such conditions, according to the original Phillips curve situated the unemployment rate at 2.5%. That Phillips marked an ideal situation. On the basis of this research politicians were convinced that they can choose between inflation and unemployment. This claim was refuted by the other economists using their own research.

Graph 1: Phillips curve



Source: Phillips, 1958

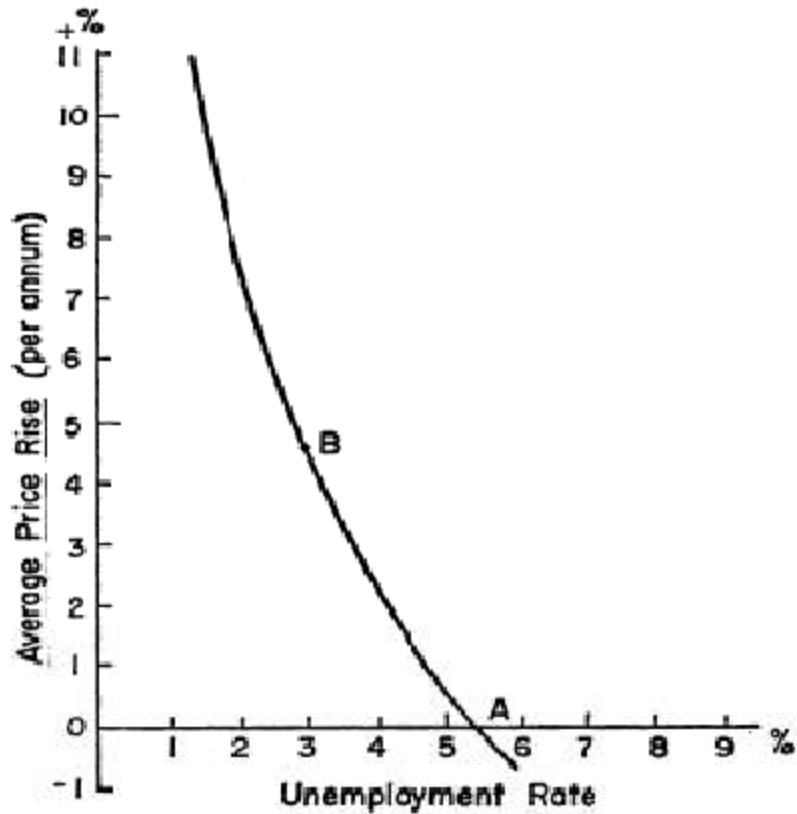
### Phillips curve by Samuelson and Solow

Samuelson and Solow (1960) modified the model of the Phillips curve, on the relationship between unemployment and price inflation. Mainly investigated the relationship between labour productivity, wage inflation and price inflation. Their knowledge they applied to the U.S. economy. They report, that at the zero wage inflation the unemployment rate would range from 8-10%. Further exploring the difference position of the original Phillips curve. The lower location of the original curve explain unions and labour market differences.

As was already mentioned at the beginning, the greatest contribution is a substitution of wage inflation on the vertical axis for price inflation. This was achieved on the basis of the following formula:

$$\text{price inflation} = \text{wage inflation} - \text{the growth of labour productivity}$$

Graph 2: Phillips curve by Samuelson and Solow



Source: Samuelson and Solow (1960)

The formula is based on the assumption that if wages are growing, consequently grow costs of production, so, if you increase wage inflation, price inflation will increase. Yet here is one exception. Although, the productivity of a certain percentage while with the same percentage increases wage inflation does not increase the price of the product and price inflation in this case is zero.

According to Samuelson and Solow (1960) the points A and B indicate interval curve with the estimated rate of unemployment and inflation in future years in the USA. However, both authors highlight that it is the Phillips curve in the short term and admit that do not know how it would look in the long term.

## **5 Practical part: The relation between unemployment and inflation in the Czech Republic in comparison with the European Union**

### **5.1 Unemployment**

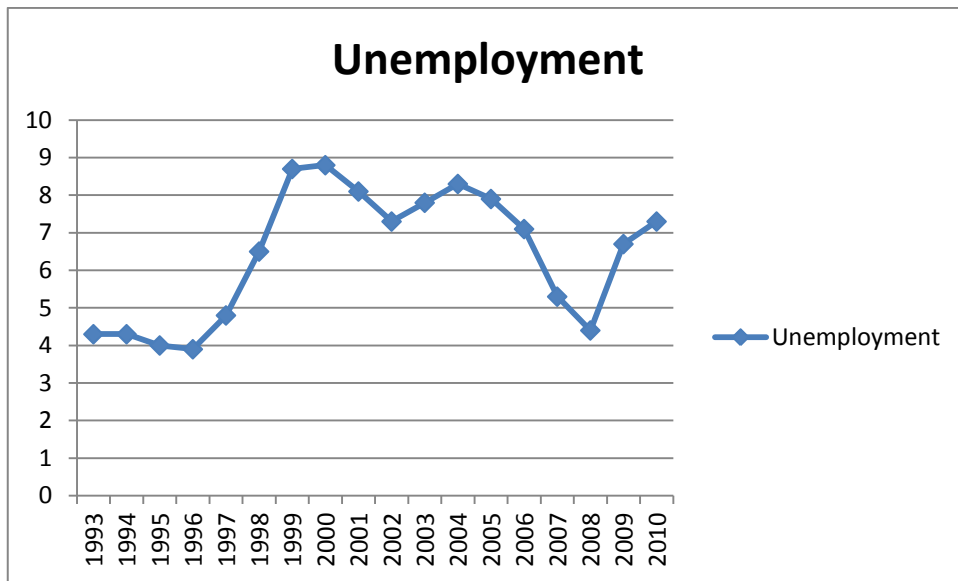
#### **5.1.1 Unemployment in the Czech Republic**

Within the concept of unemployment Czech statistical office publishes data on total unemployment and total employment in absolute value, then unemployment rate, employment rate and the level of economic activity in the relative proportions. Most viewed of these indicators are the relative unemployment rate, thus, share of the unemployed to the economically active population.

The below mentioned graph 3 includes relative share of unemployment in the Czech Republic in 1993-2010. The relative share is consists of the average quarterly obtained values. Absolute values in this analysis are not consumed, because they are not sufficiently reliable. They neither include the growth of population of the Czech Republic nor changes in the proportion of economically active and inactive population.

In graph 3 is shown some evident indication of the economic cycle. It was strongly influenced by the economic crisis in 2009 and 2010. In terms of unemployment for the Czech Republic was the best time in 1993-1997, since 1998 is facing with the unemployment rate, which can be considered higher than normal. The unemployment rate reached almost 9% in 1999 and 2000. This represented more than 450 thousand unemployed people.

Graph 3: Unemployment in the Czech Republic



Source: Own processing, data source: CSO

### 5.1.2 Structure of unemployment in the Czech Republic

This part of the work about the structure of unemployment is concerned with the composition of unemployment, or rather refers to the unemployment of geographic and demographic groups. Structure of unemployment is analyzed in terms of local regions of the Czech Republic, then in terms of age, gender and education. There is always a relative unemployment. For the absolute values always necessary replenishing the number of people in each group and with this indicator the expression would be hard comparable.

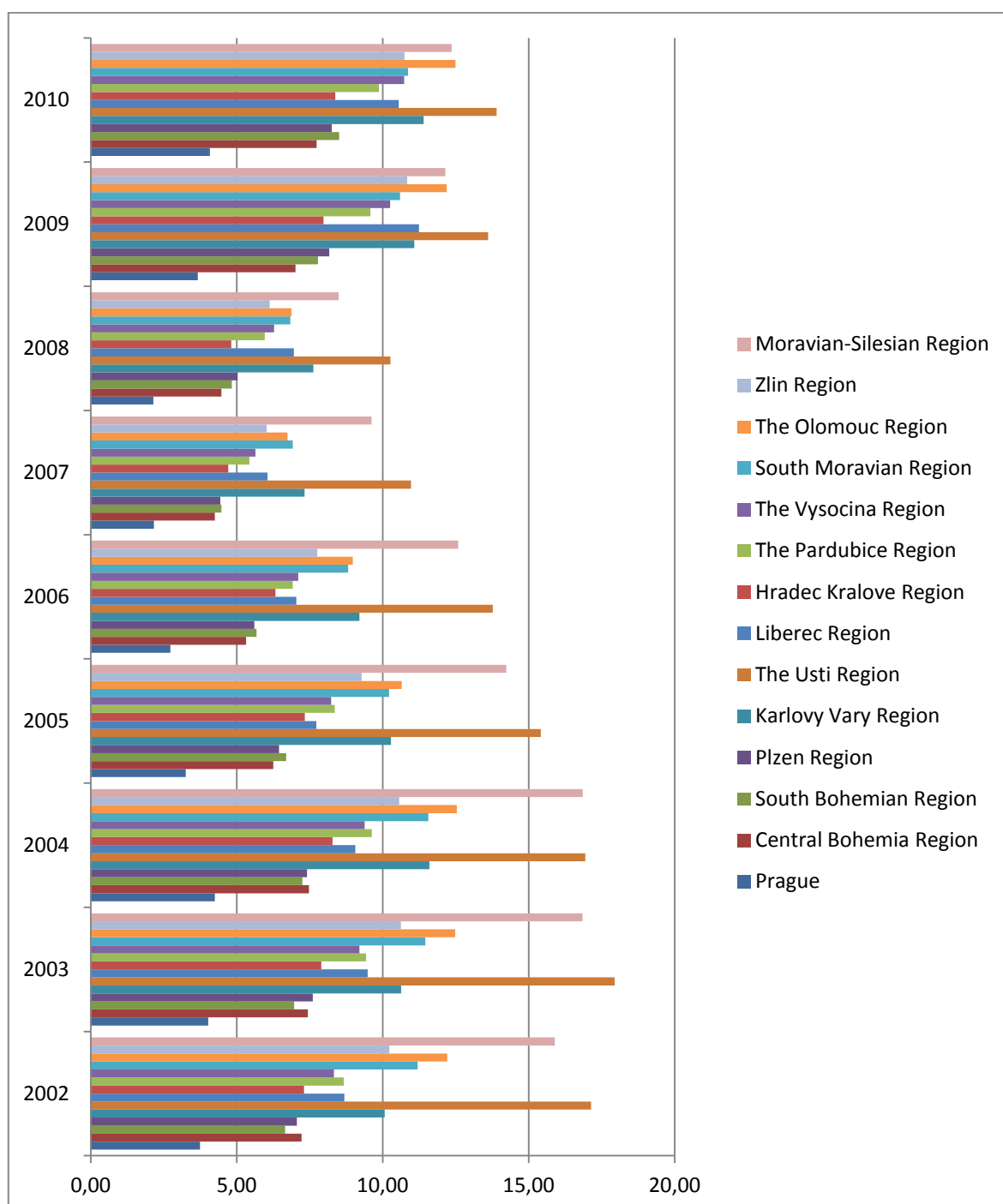
#### Structure of unemployment by regions

In the context of geographical structure is used 14 regions of the Czech Republic. The following graph 4 expressing the unemployment rates as a percentage for each year. It is not possible to compare unemployment by points in one year, but it is necessary to include several time periods, from which it is clearly visible trend in which the unemployment rate



in each region is heading. The underlying data for this graph is available in Appendix II : Structure of unemployment by regions in the Czech Republic.

Graph 4: Structure of unemployment by regions in the Czech Republic



Source: Own processing, data source: CSO

The graph very patently shows, which regions have the overall growth of unemployment in the Czech Republic. Since 2002, in the graph is shown the apparent increase of unemployment in the problematic regions Usti and Moravian-Silesian. These regions still have one of the highest unemployment rates. Total unemployment in 2007 and 2008 significantly decreases. Intensely decreased even in the most problematic regions. Even so, above mentioned regions struggling with high unemployment rates. Subsequent years 2009 and 2010, which were marked by the economic crisis, showing again higher unemployment. It increased strongly in all regions, the highest rate, however, again remained in the Usti and Moravian-Silesian regions.

It is possible to conclude that the fluctuations of unemployment rate in the Czech Republic happen for a lesser extent due to classical economic cycle, here is shown cyclical unemployment, but more often it is a structural unemployment. Unemployment in most regions shows not only an extremely small fluctuations. For example, unemployment rate in Prague is in the interval years 2002-2010 ranged only between 2,1% to 4,2%. Similarly, a balanced level of unemployment shows other regions, such as Central Bohemia, South Bohemia, Pardubice and Plzen.

In the reporting period can be found the lowest unemployment rate in the capital city Prague in 2008 at the rate of 1.9%. Conversely, the highest unemployment rate in the Czech Republic recorded in 2000 in the Usti region. There unemployment rate reached 17,9%.

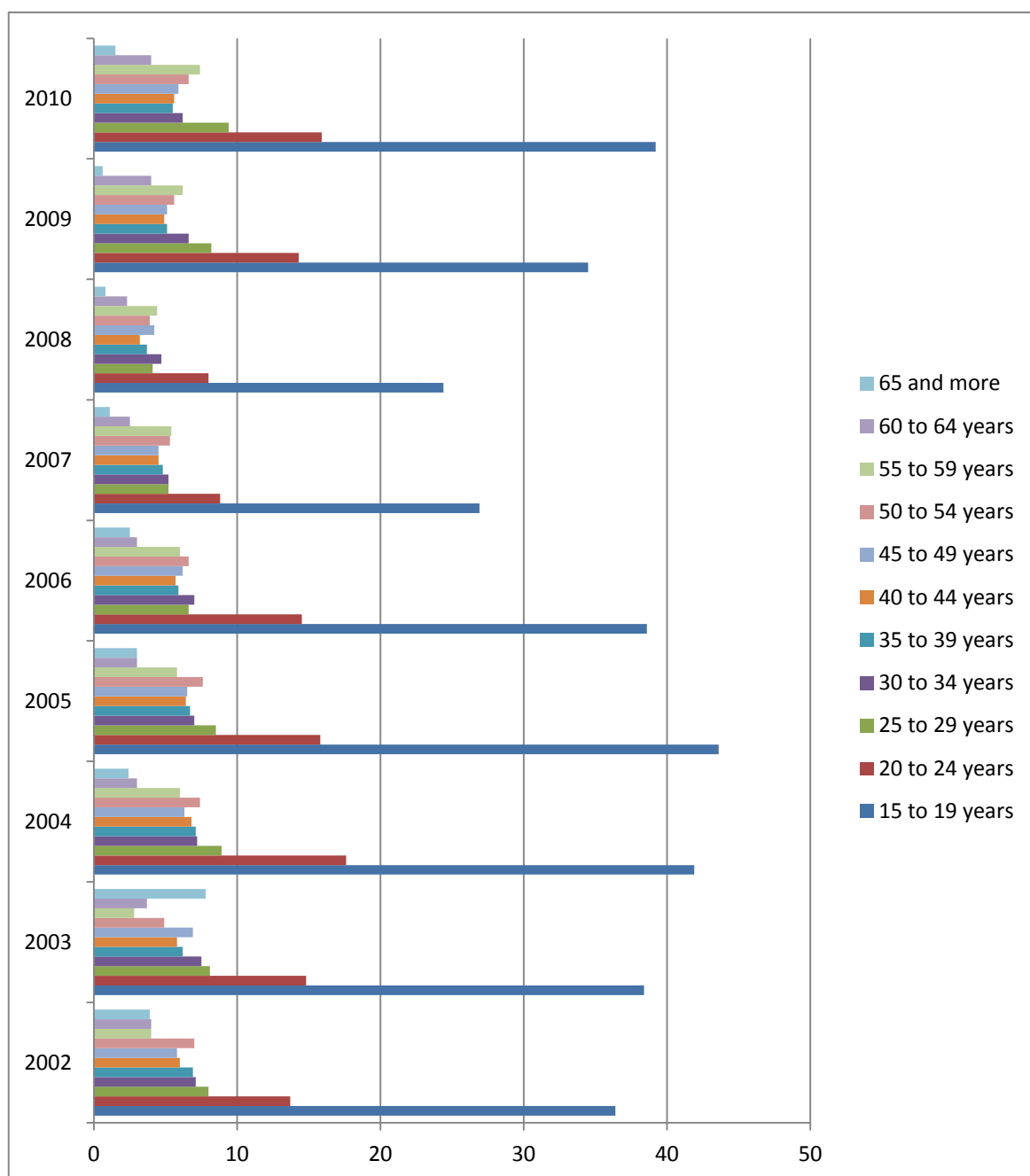
In recent years, a positive trend for the Czech Republic is reducing disparities of the unemployment rates across regions.

### **Structure of unemployment by age**

Age is one of the demographic characteristics, by which it is possible to examine structure of unemployment. The most important step in this analysis is correct segmentation of ages. For these purposes are made age groups by partitioning the Czech statistical office.

In the following graph 5, captured the unemployment rate in the years 2002 - 2010 and age categories are divided into eleven groups. The underlying data for this graph is in Appendix III: Structure of unemployment by age in the Czech Republic.

Graph 5: Structure of unemployment by age in the Czech Republic



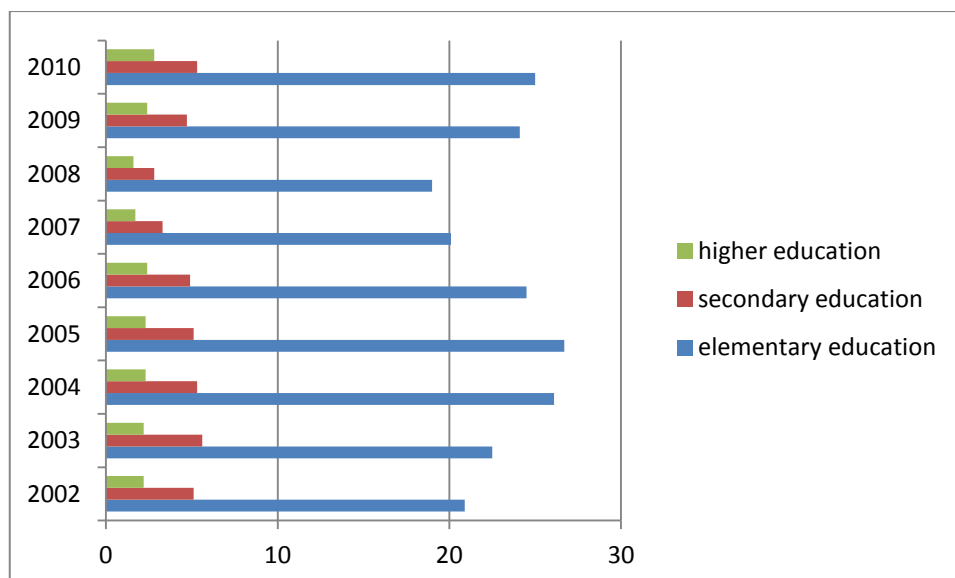
Source: Own processing, data source: CSO

The graph 5 shows detailed structure of unemployment by age groups. It is mainly a group of people aged 15-19 and 20-24. This unemployment can be attributed to people who have just graduated, have a minimum practice and are looking for their first workplace. It is usually frictional unemployment. This type of unemployment is usually short termed and does not show a significant problem. Other age groups are relatively balanced and represent cyclical unemployment. Looking at this graph it is possible to see the cycle of Czech economy and the increase of unemployment during the global financial and economic crisis in 2009 and 2010.

### Structure of unemployment by education level

Education is another demographic factor that affects the unemployment rate. For the purposes of this paper are used three groups of people by educational level - with elementary education, secondary education and higher education.

Graph 6: Structure of unemployment by education level in the Czech Republic



Source: Own processing, data source: CSO

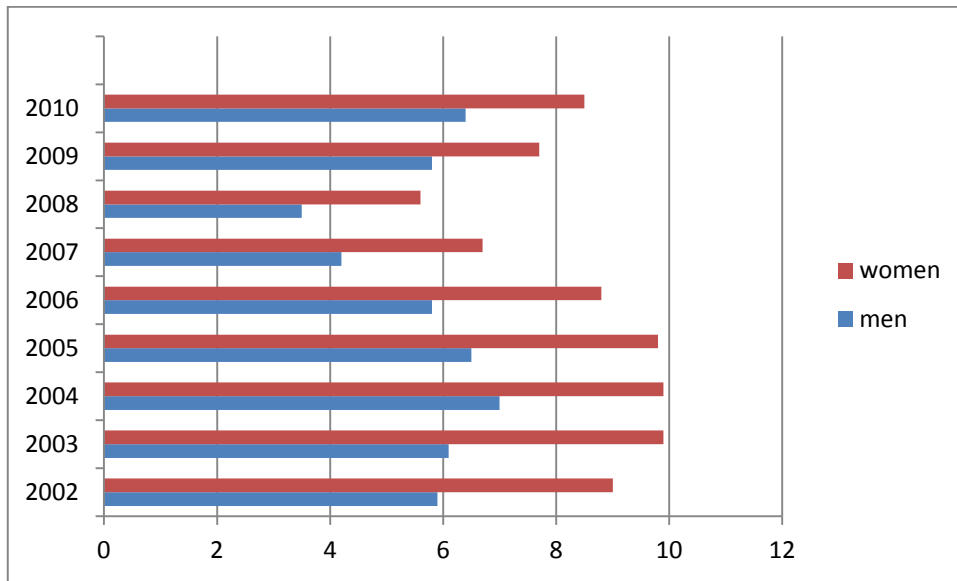
The above graph 6 shows the highest unemployment rate and the fastest growth of unemployment in the group of elementary education. The underlying data for this graph is in Appendix IV: Structure of unemployment by education level in the Czech Republic. The increase is mainly due to the increasing level of technology. Simple manual work that these groups of people could make, take over the machines and production lines. Currently, a quarter of people with this education level, due to the increasing automation technology, should expect a continuous growth of unemployment in this demographic group. People with secondary education and higher education level keeping the unemployment rate stable at relatively low levels.

### **Structure of unemployment by gender**

The last and probably the least important factor in the structure of unemployment is gender. First, it is very stable and since 2002 the female unemployment exceeds male, but this difference does not show anything. It is not possible to say with certainty whether it is structural unemployment, and thus whether higher demand typically male jobs, or whether it is due to other factors - such as discrimination. It may also be a frictional unemployment, because women often quit their job due to pregnancy.

Evidence of a slightly higher unemployment rate of women than men is in a graph 7. The underlying data for this graph can be found in Appendix V: Structure of unemployment by gender in the Czech Republic. It is evident from this graph that it is the economic cycle. In recent years, in addition to know the trend of reducing the difference of unemployment between both genders. The lowest unemployment of both men and women is long-term in the capital city Prague. Regarding to the structure of unemployment of men and women, according to the new categories and education both two groups are very similar with only minor differences.

Graph 7: Structure of unemployment by gender in the Czech Republic



Source: Own processing, data source: CSO

### 5.1.3 Unemployment in the Czech Republic in comparison with European Union

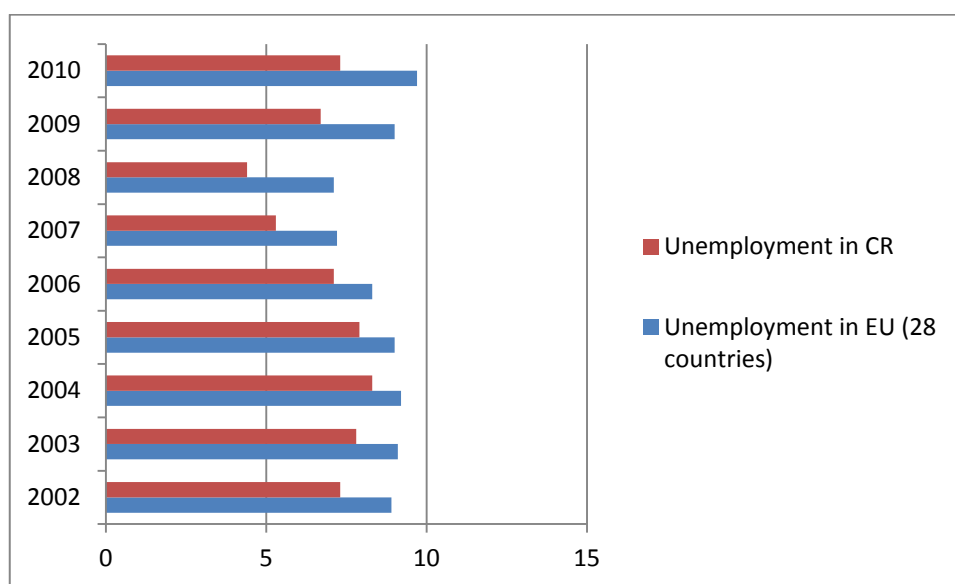
First, in graph 8 compared the unemployment in the Czech Republic and the average unemployment in European Union. At first sight, it is seen that Czech Republic has long term low unemployment than European Union. While the unemployment rate in the Czech Republic is relatively stable and does not show any significant variations, some countries of the European Union in recent years experienced a sharp rise in unemployment. In result, this will increase the average unemployment rate in European Union. The highest increase of the unemployment rate in recent years took place in Spain, Latvia, Estonia, Lithuania and Ireland. With such an unusually high increase is facing both countries in Eastern Europe and the countries of Western Europe. The highest unemployment rate was in 2010 in Spain 20.1%. While that till 2007 in Spain unemployment rate varied between 8% to 12%. Primary school graduates form most of this unemployment.

On the other hand, long term lowest and stable unemployment has Austria, Netherlands and Luxembourg. Their unemployment rate since 2002 is varying from 3.5 to 5.5%.

As was mentioned countries, where in recent years significantly increased the rate of unemployment, it is necessary to mention the countries, where the vice versa the unemployment rate decreased. In this regard, they are especially Bulgaria, Poland and Slovakia. In Bulgaria, for example, in 2002 unemployment rate decreased from 18.2% to 5.6% in 2008. After the economic crisis in 2010 unemployment rose to 10.2%. Polish unemployment rate was not affected by the economic crisis as strong as in Bulgaria. The decrease of unemployment in Poland was also mild slower. The last country which has struggled with high unemployment before the economic crisis, it was Slovakia. Government was able to reduce unemployment rate from the original 18.7% in 2002 to 9.5% in 2007. The economic crisis has snapped up the unemployment rate to 14.4%.

A complete overview of the various countries and their unemployment rates for the period from 2002 to 2010 can be viewed in Appendix VI : Unemployment rate in other countries.

Graph 8: Unemployment in the Czech Republic in comparison with the European Union



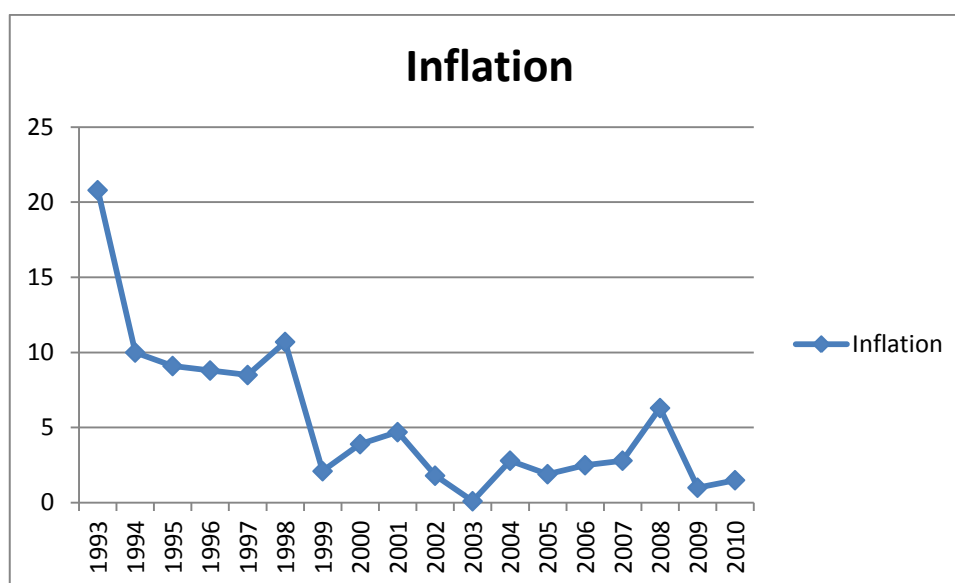
Source: own processing, data source: Eurostat

## 5.2 Inflation

### 5.2.1 Inflation in the Czech Republic

In the Czech Republic, inflation is measured from the year 1989 or 1990. For this work, however, is applied data from 1993, from this year, inflation is measured for the independent Czech Republic. This measurement conducted by the Czech statistical office and in particular by the CPI. Inflation is identified and data is presented once a month, more often, however, inflation evaluated as the annual average inflation.

Graph 9: Average inflation in the Czech Republic



Source: Own processing, data source: CSO

Since 1989 in the Czech Republic occurred relatively high and mild annual inflation and in some years galloping inflation. The highest inflation was in 1991, when was measured annual increase in prices of 56.6%. Since the formation of independent Czech Republic in 1993, the annual increase in prices ranged up to a maximum of about 10%. The only exception is year 1993, when annual inflation was 20.8%.



As it is shown in graph 9 since 1999 inflation has a balanced values with a single extremely increasing in 2008, when the economy of the Czech Republic was affected by the global financial and economic crisis.

1999 for the Czech Republic was disruptive in terms of inflation for the reason, that in 1998 was introduced the inflation targeting. The previous policy of a fixed exchange rate and the parallel targeting of the money supply has not been able to provide one of the main objectives of each economy, as a price stability. Thus, first the exchange rate with saving the policy of targeting was released, the money supply expressed the effect only in 1999. The exchange rate was released in May 1997 and the Czech national bank acceded to the inflation targeting only in November of the same year.

Since 2006, the Czech national bank (CNB) managed to keep its set targets in terms of inflation targeting, when annual increase of prices by 3% is observed with a possible deviation of one percentage point, or 2% with a possible deviation of one percent from 2007. As previously mentioned, the only year with unexpectedly high inflation was the year 2008. This increase was because of the both economic and administrative occurrence in a given year. Due to the economic crisis, the economy started to slow down and inflation did not grow as expected. The CNB responded to it by lowering the interest rates. The measures were released into circulation, more funds caused a rise in prices. The growth of inflation this year also strongly influenced by the increase of the reduced rate of value added tax from 5% to 9%, and rise of tobacco products due to higher excise duty.

### **5.2.2 Inflation measured by the producer price index in the Czech Republic**

In the previous chapter, inflation is measured, analyzed and presented by using the consumer price index (CPI). Another possible computation, although less ordinary, is the producer price index (PPI). Within this index, the most frequently statistical offices dealing with agricultural producers, manufacturers and industrial building projects.

These mentioned products are included in the table 1 where the data is expressed using basic index with base period 2005. In contrast to the previously mentioned indexes products are included in the table with index market services.

Table 1: Inflation measured by the producer price index in the Czech Republic

	<b>Agricultural producer</b>	<b>Animal</b>	<b>Crop</b>	<b>Industrial producer</b>	<b>Construction work</b>	<b>Market services price</b>
<b>2002</b>	101,2	107,4	103,8	92,4	91,8	96,6
<b>2003</b>	98,1	103,5	102,6	91,9	93,8	98,1
<b>2004</b>	106,4	109,2	116,6	97	97,3	100,4
<b>2005</b>	96	109,9	82,3	100	100,2	100
<b>2006</b>	97,1	105,7	88,1	101,6	103,1	103,4
<b>2007</b>	113,4	107,4	117	105,8	107,2	105,1
<b>2008</b>	123,4	113	130,8	110,5	111,9	109,1
<b>2009</b>	92,7	95,9	88,7	107	113,3	110,7
<b>2010</b>	100	100	100	108,3	113	109,3

Source: Own processing, data source: CSO

Agricultural producer price index since 2002 constantly fluctuating, both overall and individually for animal and vegetable products. In the table can be found indexes greater than 100 and less, both before the base period and afterwards. Therefore it is not possible to establish with certainty the trend of the price index of agricultural producers. This variation is especially in plant product, where is a great dependence on seasonality and weather. In general, it can be stated, that due to the beneficial agricultural conditions is more crop and the prices are lower. Conversely, if the less crop, prices are higher. High prices of animal products are related to their breeding and disease incidence.

### 5.2.3 Inflation measured by the GDP deflator

This chapter presents the rate of inflation, calculated using the latest methods of measurement, the GDP deflator. It should be remembered that inflation computed by the GDP deflator is not a result consistent of the calculation using the consumer price index. The main difference is the composition of the consumer basket and the fact that GDP

includes only products made in the Czech Republic. It is thus adjusted for inflation of imported goods and services.

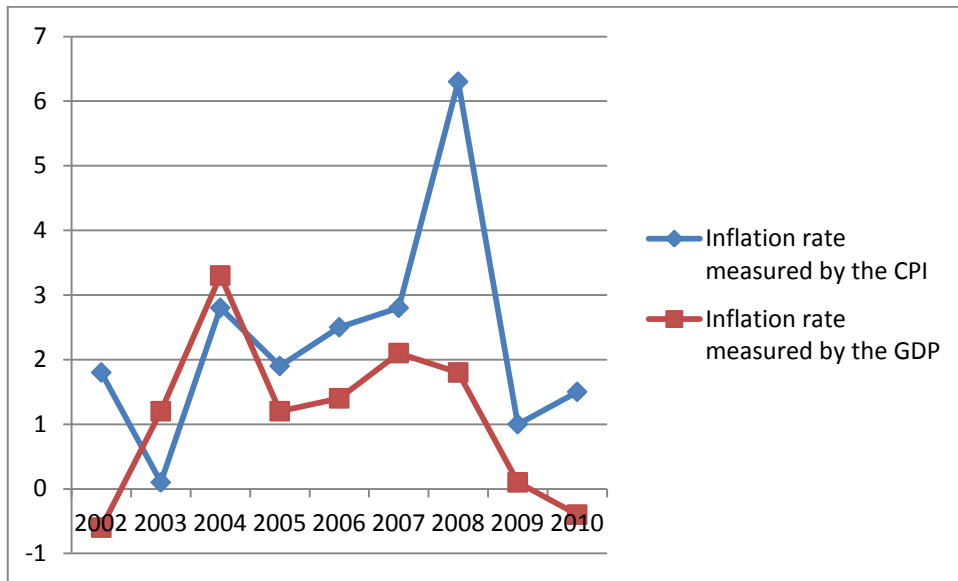
Table 2: Inflation in the Czech Republic measured by the GDP deflator

	Nominal GDP in mil CZK	Real GDP in mil CZK	Basic index deflator GDP	Inflation rate measured by the GDP
<b>2002</b>	6154425	6512590	94,50%	-0,6
<b>2003</b>	6547983	6849973	95,59%	1,2
<b>2004</b>	7162337	7251286	98,77%	3,3
<b>2005</b>	7611835	7611835	100,00%	1,2
<b>2006</b>	8507426	8385942	101,45%	1,4
<b>2007</b>	9379629	9056257	103,57%	2,1
<b>2008</b>	9742514	9241008	105,43%	1,8
<b>2009</b>	8867859	8403976	105,52%	0,1
<b>2010</b>	9304832	8851453	105,12%	-0,4

Source: Own processing, data source: CSO

Inflation is here expressed again with a basic index, which forms the base period 2005. However, it is also shown as a classic annual growth. At first sight, shown in a graph 10 inflation measured by the GDP deflator is slower than inflation measured by the consumer price index. Main index differences were noted above, it can be stated that Czech products and services are more expensive slower, or even at some times cheaper. Higher inflation measured by the CPI reflects the rapid rise in prices of imported goods and services from abroad.

Graph 10: Inflation rate measured by the CPI and inflation rate measured by the GDP



Source: Own processing, data source: CSO

#### 5.2.4 Wage inflation in the Czech Republic

Before was mentioned only price inflation: inflation measured by the consumer price index, producer price index and the GDP deflator. Here is mentioned wage inflation, it is annual increase in wages. Before was defined the difference between the wage and price inflation and the possibility of its calculation. The difference between price inflation and wage inflation forms labour productivity. If the rise in nominal wages higher than inflation measured by consumer index, labour productivity grows.

Table 3: Wage inflation and Labour productivity in the Czech Republic

	Nominal wage index	Price inflation	Labour productivity (index of real wage)
2002	8	1,8	6,2
2003	5,8	0,1	5,7
2004	6,3	2,8	3,5
2005	5	1,9	3,1
2006	6,6	2,5	4,1
2007	7,2	2,8	4,4
2008	7,8	6,3	1,5
2009	3,3	1	2,3
2010	1,9	1,5	0,4

Source: Own processing, data source: CSO

Table 3 shows that labour productivity in the Czech Republic is annually increasing. In the table is used available data for the years 2002 to 2010. Average monthly nominal wages during those years increased from 15524 CZK in 2001 to 23,797 CZK in 2010. Labour productivity in this period alternately stretched both private as well as the public sector. According to the latest available information from 2010, the average monthly wage of public sector was higher at 600 CZK than the average monthly wage of private sector.

### 5.2.5 Inflation in the Czech Republic in comparison with the European Union

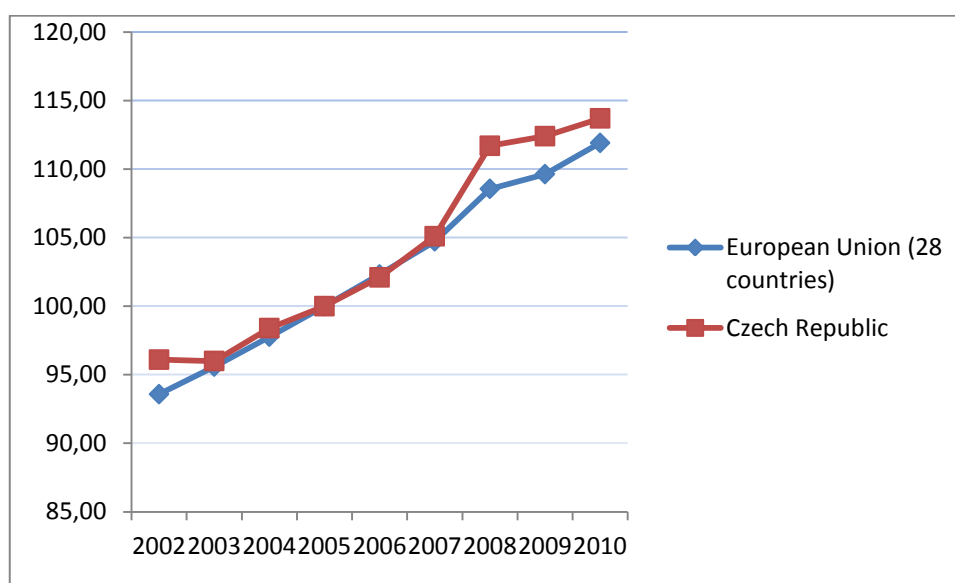
In the European Union, measures and records inflation Eurostat. For the measurement of inflation uses harmonised index of consumer prices (HICP). It is a method that enables subsequent comparison of inflation between countries and also comparison of the European average.

The table, which is in Appendix VII shows all available data on inflation since 2002. There is included all European Union countries and also comparing several countries outside the European Union and even a few countries outside the European continent. In addition, in

the Appendix VIII is shown the average of the European Union and the Euro area. Inflation is expressed here with a basic index, defined with the base year of 2005.

The most important data for this work are data of the Czech Republic and average data of the European Union. One of the aims of this work is precisely determine the achieved inflation of the Czech Republic in comparison with the European Union. These data reveal a very mild higher inflation than the average European Union.

Graph 11: Inflation in the Czech Republic in comparison with the European Union



Source: own processing, data source: Eurostat

The most useful of that table is the first line where captured data on inflation of the European Union according to the actual number of countries in a given year. In contrast to this average can be seen that inflation in the Czech Republic is mild higher. Here is should be mentioned year 2008, when in the Czech Republic was a sudden increase in the harmonized index of consumer prices. This increase occurred only in the Czech Republic and was due to the legislative changes at the national level, that have already been mentioned several times. From that year the annual increase of prices again is very similar to the average European Union. In recent years, inflation is lower and approaches to the

basic index values of the European Union. The equilibrium of inflation in the Czech Republic and the average inflation in the European Union is evident from the graph 11, where curves of the development of the basic index overlap.

## 6 Results and discussion

The practical part of this work shows, that not only Czech Republic, but also most countries of the European Union have the current problem as an unemployment. Inflation has managed to keep the required standards, which are determined in the price policy. If, therefore, was considered the relationship between unemployment and inflation, as it was defined by Phillips or later modified by Samuelson and Solow, it would be at the current moment advisable to reduce unemployment at the cost of higher inflation. This solution appears as a more equitable in terms of the all inhabitants of the world. While unemployment affects only a certain part of the population, those, who is in a state of unemployed and those, for whom employers may reduce wages because of high unemployment, inflation would affect the entire population, who holds only a Czech currency. Each holder at the high unemployment would pay only the inflationary tax (the money would lose value). In addition, high unemployment adversely affect the level of production and, consequently, the amount of government revenue through taxes, social and health insurance. This subsequently does not allow the state increasing expenditures, or the state has to take money from the foreign sources and increase the national debt. The relationship between unemployment and inflation would, therefore, deserve greater attention from unemployment policy and domestic production.

Solution of the unemployment and inflation in today's political system is very complicated. Generally, the central bank is dealing with the stability of the price level and therefore inflation, in Czech Republic it is the Czech national bank. It acts as an independent authority to the government and its goal is only price stability. Unemployment, on the other hand, deals, mainly, with the government through fiscal policy. Thus, if the government wanted to use the inverse relationship between unemployment and inflation, it would have to convince the central bank, using its available tools, allow an increase in inflation and thus slightly retreat from its goal of price stability level. The final decision is always made by the central bank.

In some countries, the central bank is dependent of the government. Even so they have to keep the price level at a relatively stable level.



## 7 Conclusion

Inflation and unemployment are two important macroeconomic indicators that tell about the economy and directly affect the country's population. Inflation is the annual increase of prices mostly expressed in a percentage. Frequently is measured by the consumer price index (CPI). Other methods of measurement are used by the producer price index and the GDP deflator. Unemployment represents the percentage of the unemployed population to the economically active population. It is also expressed in a percentage and is always related to a particular time series.

Inflation in the Czech Republic can be measured since 1993, when the independent Czech Republic was established. From that time the price level was stabilized. In 1993 the inflation values acquired 20.8% and in the next years despite its decline was about 10%. Significant changes occurred in 1999, when the economy started to operate central bank policy of inflation targeting. From this year the Czech currency can be considered as very stable, with annual increase on prices up to 3%. The only exception is year 2008, when inflation reached 6.3%. The reason for this fluctuations were the economic and financial crisis.

In the context of unemployment was again used data from 1993 to 2010. The development trend in the Czech Republic is the opposite of inflation, and also less beneficial. Unemployment in the Czech Republic has frequent fluctuations and using them it is possible to count up the economical cycle, which is again in 2009 was bothered by the economic crisis. In 1993-1998, the unemployment rate in the Czech Republic did not show a significant problem and reached values of around 4%, then in 1998 a maximum of 6.5%. In the next eight years, began to show a decline in the economy and unemployment rate reached values of around 8%. In 2007, unemployment has started to fall, but just two years later significantly increased due to the crisis. In terms of the structure of unemployment by regions shows that are beginning the differences between individual regions slowly blurring. From the three levels of education observed in the research the largest part of the unemployed mainly consists of young graduates aged 15-19.

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**Internet resources:**

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2. Eurostat. <http://epp.eurostat.ec.europa.eu/>

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## Appendix I: Unemployment in the Czech Republic

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
Unemployment	4,3	4,3	4	3,9	4,8	6,5	8,7	8,8	8,1

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Unemployment	7,3	7,8	8,3	7,9	7,1	5,3	4,4	6,7	7,3

Source: Own processing, data source: CSO

## Appendix II: Structure of unemployment by regions in the Czech Republic

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Prague	3,73	4,02	4,24	3,25	2,72	2,16	2,14	3,66	4,07
Central Bohemia Region	7,21	7,43	7,47	6,25	5,32	4,25	4,47	7,01	7,73
South Bohemian Region	6,65	6,96	7,24	6,69	5,68	4,47	4,83	7,78	8,50
Plzen Region	7,06	7,60	7,41	6,45	5,60	4,43	5,03	8,16	8,25
Karlovy Vary Region	10,07	10,62	11,60	10,28	9,20	7,32	7,62	11,07	11,39
The Usti Region	17,13	17,94	16,93	15,41	13,77	10,96	10,26	13,61	13,90
Liberec Region	8,68	9,48	9,06	7,73	7,04	6,05	6,95	11,24	10,54
Hradec Kralove Region	7,30	7,89	8,28	7,33	6,32	4,70	4,81	7,97	8,37
The Pardubice Region	8,66	9,42	9,62	8,35	6,91	5,43	5,95	9,58	9,87
The Vysocina Region	8,32	9,20	9,38	8,23	7,10	5,63	6,27	10,25	10,73
South Moravian Region	11,20	11,45	11,56	10,21	8,82	6,92	6,83	10,59	10,87
The Olomouc Region	12,20	12,48	12,53	10,65	8,97	6,73	6,87	12,19	12,48
Zlin Region	10,22	10,61	10,56	9,27	7,75	6,02	6,13	10,83	10,74
Moravian-Silesian Region	15,89	16,84	16,85	14,23	12,58	9,62	8,49	12,14	12,36

Source: Own processing, data source: CSO

### Appendix III: Structure of unemployment by age in the Czech Republic

	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>15 to 19 years</b>	36,4	38,4	41,9	43,6	38,6	26,9	24,4	34,5	39,2
<b>20 to 24 years</b>	13,7	14,8	17,6	15,8	14,5	8,8	8	14,3	15,9
<b>25 to 29 years</b>	8	8,1	8,9	8,5	6,6	5,2	4,1	8,2	9,4
<b>30 to 34 years</b>	7,1	7,5	7,2	7	7	5,2	4,7	6,6	6,2
<b>35 to 39 years</b>	6,9	6,2	7,1	6,7	5,9	4,8	3,7	5,1	5,5
<b>40 to 44 years</b>	6	5,8	6,8	6,4	5,7	4,5	3,2	4,9	5,6
<b>45 to 49 years</b>	5,8	6,9	6,3	6,5	6,2	4,5	4,2	5,1	5,9
<b>50 to 54 years</b>	7	4,9	7,4	7,6	6,6	5,3	3,9	5,6	6,6
<b>55 to 59 years</b>	4	2,8	6	5,8	6	5,4	4,4	6,2	7,4
<b>60 to 64 years</b>	4	3,7	3	3	3	2,5	2,3	4	4
<b>65 and more</b>	3,9	7,8	2,4	3	2,5	1,1	0,8	0,6	1,5

Source: Own processing, data source: CSO

### Appendix IV: Structure of unemployment by education level in the Czech Republic

	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>elementary education</b>	20,9	22,5	26,1	26,7	24,5	20,1	19	24,1	25
<b>secondary education</b>	5,1	5,6	5,3	5,1	4,9	3,3	2,8	4,7	5,3
<b>higher education</b>	2,2	2,2	2,3	2,3	2,4	1,7	1,6	2,4	2,8

Source: Own processing, data source: CSO

### Appendix V: Structure of unemployment by gender in the Czech Republic

	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>men</b>	5,9	6,1	7	6,5	5,8	4,2	3,5	5,8	6,4
<b>women</b>	9	9,9	9,9	9,8	8,8	6,7	5,6	7,7	8,5

Source: Own processing, data source: CSO

## Appendix VI: Unemployment rate in other countries.

GEO/TIME	2002	2003	2004	2005	2006	2007	2008	2009	2010
European Union (28 countries)	9,0	9,2	9,3	9,1	8,3	7,2	7,1	9,0	9,7
Euro area (18 countries)	8,5	9,1	9,3	9,2	8,5	7,6	7,6	9,6	10,2
Belgium	7,5	8,2	8,4	8,5	8,3	7,5	7,0	7,9	8,3
Bulgaria	18,2	13,7	12,1	10,1	9,0	6,9	5,6	6,8	10,3
Czech Republic	7,3	7,8	8,3	7,9	7,1	5,3	4,4	6,7	7,3
Denmark	4,6	5,4	5,5	4,8	3,9	3,8	3,5	6,0	7,5
Germany (until 1990 former territory of the FRG)	8,7	9,8	10,5	11,3	10,3	8,7	7,5	7,8	7,1
Estonia	10,3	10,1	9,7	7,9	5,9	4,6	5,5	13,8	16,9
Ireland	4,5	4,6	4,5	4,4	4,5	4,7	6,4	12,0	13,9
Greece	10,3	9,7	10,5	9,9	8,9	8,3	7,7	9,5	12,6
Spain	11,4	11,4	10,9	9,2	8,5	8,3	11,3	18,0	20,1
France	8,3	8,9	9,3	9,3	9,2	8,4	7,8	9,5	9,7
Croatia	15,1	14,1	13,8	12,8	11,4	9,6	8,4	9,1	11,8
Italy	8,5	8,4	8,0	7,7	6,8	6,1	6,7	7,8	8,4
Cyprus	3,5	4,1	4,6	5,3	4,6	3,9	3,7	5,4	6,3
Latvia	12,5	11,6	11,7	10,0	7,0	6,1	7,7	17,5	19,5
Lithuania	13,9	12,6	11,6	8,5	5,8	4,3	5,8	13,8	17,8
Luxembourg	2,6	3,8	5,0	4,6	4,6	4,2	4,9	5,1	4,6
Hungary	5,6	5,8	6,1	7,2	7,5	7,4	7,8	10,0	11,2
Malta	7,4	7,7	7,2	6,9	6,9	6,5	6,0	6,9	6,9
Netherlands	3,1	4,2	5,1	5,3	4,4	3,6	3,1	3,7	4,5
Austria	4,2	4,3	4,9	5,2	4,8	4,4	3,8	4,8	4,4
Poland	20,0	19,8	19,1	17,9	13,9	9,6	7,1	8,1	9,7
Portugal	5,7	7,1	7,5	8,6	8,6	8,9	8,5	10,6	12,0
Romania	7,5	6,8	8,0	7,2	7,3	6,4	5,8	6,9	7,3
Slovenia	6,3	6,7	6,3	6,5	6,0	4,9	4,4	5,9	7,3
Slovakia	18,8	17,7	18,4	16,4	13,5	11,2	9,6	12,1	14,5
Finland	9,1	9,0	8,8	8,4	7,7	6,9	6,4	8,2	8,4
Sweden	6,0	6,6	7,4	7,7	7,1	6,1	6,2	8,3	8,6
United Kingdom	5,1	5,0	4,7	4,8	5,4	5,3	5,6	7,6	7,8
Iceland	:	3,3	3,1	2,6	2,9	2,3	3,0	7,2	7,6
Norway	3,7	4,2	4,3	4,5	3,4	2,5	2,5	3,2	3,6

Data source: Eurostat



## Appendix VII: Average inflation in the Czech Republic

	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Inflation</b>	20,8	10	9,1	8,8	8,5	10,7	2,1	3,9	4,7

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Inflation</b>	1,8	0,1	2,8	1,9	2,5	2,8	6,3	1	1,5

Source: Own processing, data source: CSO

### Appendix VIII: Inflation in the European Union

GEO/TIME	2002	2003	2004	2005	2006	2007	2008	2009	2010
European Union (28 countries)	93,58	95,59	97,77	100,00	102,31	104,73	108,56	109,63	111,91
Euro area (18 countries)	93,78	95,76	97,85	100,00	102,21	104,41	107,87	108,20	109,95
Belgium	94,32	95,75	97,53	100,00	102,33	104,19	108,87	108,86	111,40
Bulgaria	86,80	88,84	94,30	100,00	107,42	115,55	129,36	132,56	136,58
Czech Republic	96,1	96,0	98,4	100,0	102,1	105,1	111,7	112,4	113,7
Denmark	95,6	97,5	98,3	100,0	101,8	103,5	107,3	108,4	110,8
Germany (until 1990 former territory of the FRG)	95,4	96,4	98,1	100,0	101,8	104,1	107,0	107,2	108,4
Estonia	91,95	93,22	96,05	100,00	104,45	111,49	123,31	123,56	126,95
Ireland	92,0	95,7	97,9	100,0	102,7	105,6	108,9	107,1	105,4
Greece	90,67	93,79	96,63	100,00	103,31	106,40	110,90	112,40	117,68
Spain	91,04	93,86	96,73	100,00	103,56	106,51	110,91	110,64	112,90
France	93,86	95,89	98,14	100,00	101,91	103,55	106,82	106,93	108,79
Croatia	92,83	95,06	97,09	100,00	103,29	106,04	112,19	114,68	115,93
Italy	93,1	95,7	97,8	100,0	102,2	104,3	108,0	108,8	110,6
Cyprus	92,51	96,18	98,00	100,00	102,25	104,46	109,03	109,22	112,02
Latvia	85,58	88,10	93,55	100,00	106,57	117,32	135,21	139,62	137,91
Lithuania	97,34	96,29	97,41	100,00	103,79	109,83	122,01	127,09	128,60
Luxembourg	91,04	93,36	96,37	100,00	102,96	105,69	110,01	110,02	113,10
Hungary	86,46	90,50	96,63	100,00	104,03	112,28	119,05	123,85	129,70
Malta	93,14	94,95	97,53	100,00	102,58	103,29	108,13	110,12	112,37
Netherlands	95,05	97,18	98,52	100,00	101,65	103,26	105,54	106,57	107,56
Austria	94,83	96,06	97,94	100,00	101,69	103,93	107,28	107,71	109,53
Poland	93,8	94,5	97,9	100,0	101,3	103,9	108,3	112,6	115,6
Portugal	92,51	95,52	97,92	100,00	103,04	105,54	108,34	107,36	108,85
Romania	71,09	81,94	91,68	100,00	106,60	111,84	120,69	127,43	135,17
Slovenia	89,09	94,16	97,60	100,00	102,54	106,39	112,28	113,25	115,62
Slovakia	83,48	90,52	97,28	100,00	104,26	106,23	110,41	111,43	112,21
Finland	97,82	99,10	99,24	100,00	101,28	102,88	106,91	108,66	110,49
Sweden	95,94	98,18	99,18	100,00	101,50	103,20	106,65	108,72	110,80
United Kingdom	95,4	96,7	98,0	100,0	102,3	104,7	108,5	110,8	114,5
Iceland	95,09	96,41	98,64	100,00	104,65	108,45	122,29	142,18	152,79
Norway	96,1	97,9	98,5	100,0	102,5	103,2	106,7	109,2	111,8
Switzerland	:	:	:	100,0	101,0	101,8	104,2	103,4	104,1
Turkey	67,07	84,04	92,48	100,00	109,28	118,85	131,26	139,47	151,43
United States	91,79	93,88	96,43	100,00	103,17	105,88	110,51	109,60	112,26

Data source: Eurostat