Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Bachelor Thesis

Correlation between the Unemployment of University Bachelor Graduates and their University's Culture

Kristýna Novotná

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Kristýna Novotná

Business Administration

Thesis title

Correlation between the Unemployment of University Bachelor Graduates and their University's Culture

---

Objectives of thesis

The objective of this paper is to try and find a correlation between unemployment of university graduates and what their University had to offer to them throughout their studies. This will be compared to the changes in minimum salary which will be used as a macro-economic factor.

Methodology

To fulfill the objective of this work there will be data collected from the chosen universities and will be compared to changes in unemployment of bachelor graduates to find correlations. The unemployment will also be compared to the changes in the minimum salary. The data will be worked through Microsoft Excel and its regression.

The proposed extent of the thesis

40 pages

Keywords

Unemployment, University, Bachelor graduates, Minimum salary, University culture

---

Recommended information sources

Diamond, P. (2013). Cyclical Unemployment, Structural Unemployment. IMF Economic Review, 61(3), pp.410-455.

Moffitt, R. (2014). Unemployment benefits and unemployment. IZAWOL.

Švarcová, J. and Horáková, M. (2015). The Macroeconomic View Of The Unemployment Of University Graduates In The Czech Republic. International Journal of Business and Management, Vol. III,(No. 1), pp.106-118.

Wilkinson, R. G. (1986). Class and health: research and longitudinal data. London: Tavistock Publications.

Expected date of thesis defence

2015/16 SS – FEM

The Bachelor Thesis Supervisor

Ing. Petr Procházka, Ph.D., MSc

Supervising department

Department of Economics

Electronic approval: 3. 3. 2016

prof. Ing. Miroslav Svatoš, CSc.

Head of department

Electronic approval: 3. 3. 2016

Ing. Martin Pelikán, Ph.D.

Dean

Prague on 03. 03. 2016

Declaration

I declare that I have worked on my bachelor thesis titled "Correlation between the Unemployment of University Bachelor Graduates and their University's Culture " by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any other person.

In Prague on date of submission _____

Acknowledgement

I would like to thank Ing. Petr Procházka, MSc, Ph.D. for his guidance and motivation during my work on this thesis.

Korelace mezi nezaměstnaností vystudovaných bakalářů a kulturou jejich university

Souhrn

Tato teze shrne co je nezaměstnanost, minimální mzda a bude definovat co tvoří univerzitní kulturu. Určité faktory, které tvoří univerzitní kulturu budou porovnávány s nezaměstnaností vystudovaných bakalářů. K tomu byly vybrány tři hlavní univerzity s ekonomickými obory – Karlova Univezita, Vysoká škola ekonomická v Praze a Česká zemědělská univerzita.

Dále byli vybrány faktory, které reprezentují kultůru univerzit – počet profesorů, docentů, cizinců a českých studentů, kteří se účastní ERASMUS programu. Tyto faktory budou pomocí regresivní analýzy v Microsoft Excel porovnány s nezaměstnaností korespondující univerzity. Nezaměstnanost jednotlivých univerzit bude dále porovnána s minimální mzdou.

Klíčová slova: Nezaměstnonost, Bakalářské studium, Kultura univerzit, Minimální mzda, Univerzita, Profesoři, Docenti, Cizinci, Erasmus

Correlation between the Unemployment of University Bachelor Graduates and their University's Culture

Summary

In the thesis we will summarise what is unemployment, minimum salary and define what makes up the university culture. Certain factors that will make up the changes in culture will be compared to the unemployment of graduates. These factors are: number of professors, associate professors, foreigners attending the university and Czech students participating in the ERASMUS programme.

I have chosen three major universities with economic programmes – Charles University, University of Economics, Prague and last but not least my home university the Czech University of Life Sciences. Afterwards I have compared the unemployment of bachelor graduates from each university to the changes in the minimum salary and tried to find a correlation between them.

Keywords: Bachelor graduates, University culture, Unemployment, Minimum salary, Professors, Associate professors, Foreigners, Erasmus

Table of content

List of Figures

List of Tables

Abstract

This paper is going to observe the unemployment of university graduates and the rest of the Czech population and try to find a correlation to their University's offer like number of professors, opportunities to study abroad and the number of graduates. This will be done through author-made graphs created from data collected from official sources. Theory explaining the data will be acquired from classes, scientific articles and books.

Objective

The objective of this paper is to try and find a correlation between unemployment of university graduates and what their University had to offer to them throughout their studies. This will be compared to the changes in minimum salary which will be used as a macro-economic factor.

Methodology

To fulfil the objective of this work there will be data collected from the chosen universities and will be compared to changes in unemployment of bachelor graduates to find correlations. The unemployment will also be compared to the changes in the minimum salary. The data will be worked through Microsoft Excel and its regression function.

1. Introduction

The focus of this paper will be on the unemployment of university bachelor graduates. The aim will be to try to find and estimate the correlation between the growth of the minimum salary and unemployment of university graduates.

Why try to find the reason behind unemployment? Mainly because high unemployment is a real problem for economies as it is a drainage of resources and there is a large amount of unutilised work force. This leads to the slowing down of the economy, higher pressure on the employed population in the means of taxes and national budgetary cuts and adverse effects on the health of the population (Wilkinson, R. G., 1986).

Unemployment negatively affects individuals – they can become depressed, lose contact with their social circles and have anxiety which leads to other health problems. People that have been unemployed for a longer period of time have a harder time to get into and back to the work process because of the (usually) lacking discipline needed for everyday employment.

The way a university prepares its pupils will, for sure, also affect their rate of success at job hunting. For this reason I have decided to track the universities' cultures by the changes in chosen factors – number of professors, associate professors, researchers, foreigners and Czech students traveling abroad to study in the Erasmus program.

That is why this thesis will try to evaluate a certain culture that three universities in the Czech republic have, quantify it and try to reach a conclusion if changes in the culture affect the unemployment rate.

The chosen universities are Charles University, University of Economics in Prague and Czech University of Life Sciences. The cultural signs that will be observed will be from the economics department that these universities have and the data are going to be taken from official documents published by these universities.

Minimum salary is state decreed and is meant to set a standard that protects the least educated, employees and employers. It protects (possible) employees from being taken advantage of and it is the state's way of making sure the person will be able to take care of themselves, work and not take social benefits. The salary has to be set so it would be more profitable to the citizen to actually work and not take benefits.

The fact that minimum salary affects unemployment has captured my attention. At first glance there is no correlation between these two economic phenomena but after some consideration it starts to make sense. The higher the minimum salary is, the more people want to work (they might have calculated that they get more money than they would get on social benefits). But what it means for the employer is that they must pay more money for the same amount of work and hence might decide that hiring a new employee or even keeping a current employee is not worth the expense. After all the employer pays 34% of the employees "superwage" to the government through various taxations.

We live in a world where automatization is not so far-fetched in many fields and so an actual human contact could be considered a luxury.

2. Literature Review

2.1 Unemployment

2.1.1 Unemployment in general

The term unemployment is understood as a phenomena where a person is not an employee and is actively looking for employment. This person is over 15 years old and is willing and able to start working within a fortnight.

There is more than one type of unemployment – long term unemployment, cyclical, frictional and structural unemployment.

A very problematic economical issue is long term unemployment (which is in a time frame of over 1 year), where it is not only very hard for the person to get back to the work process but is also a burden on the state economy. The term "unemployment" does not include those who have given up on looking for work, which comprises a large part of the nonworking population. These people have stopped looking for a job because of differing reasons – they are demotivated by the lack of opportunities, they cannot get out of the routine caused by the lack of responsibilities and habits linked to the work process or they found out it is actually easier to stay at home and live off of social benefits.

The minimum salary and social benefits (both monetary and the rules to obtain them) should both be observed carefully so the number of citizens that decide to stay at home and not work is minimal.

The main problem with long-term unemployment is that these worker lose their skills and abilities and so there is a loss of human capital which will have to be retrained or taught again from the start. Modern technologies change so fast that it could be quite costly and time consuming to retrain a person which could pose a problem for the citizen in being employed again.

Problems that are linked to high unemployment are many – it encourages xenophobia and patriotism as workers fear that foreigners steal their jobs. If people have less money to spend it could lead to crime which negatively affects society and economy at the place. It has also been found that unemployment causes premature death by 63% which is not a small number (LiveScience.com, 2016). This means that there will be less work-able citizens and we can assume that these citizens were in need of more attention health-wise than employed people and so they are even more of a drain of the economy.

Cyclical unemployment is caused repetitively, the best example could be seasonal jobs like builders or foresters, people that are unable to do their jobs because of seasonal changes. These people will either have to live off of what they earn during the rest of the year or pursue another line of work.

Structural unemployment is caused by the mismatch between the skillset that employers seek and the skillset that employees seeking work have.

If people were to accept the first job opportunity that is presented to them the economy will not work efficiently as the employee might work at a level which might be below his actual possibility of production.

There is a natural unemployment caused by other things than bad economy. This is the lowest unemployment rate that the economy can sustain and at which the inflation rate stays the same and is also called economy at full employment. This is caused by people changing jobs, entering the market or moving to a different location (frictional unemployment).

Some measure of unemployment is needed to keep a healthy level of competitiveness, generally accepted as a rate of about 3-6%. Any more than that causes a strain on the economy – a dead weight loss.

2.1.2   Dead weight loss

The dead weight loss (in this scenario in the consumer surplus area) means that the demand is somehow stuck higher than the supply curve which causes an ineffectiveness where resources are used in a less efficient way (Investopedia, 2003). Because the loss is in the consumer surplus, the burden of this inefficiency is on the consumers' shoulders. This means that they will consume less, which leads to less production which leads to more layoffs until an equilibrium is found.

2.1.3   Unemployment calculation

This paper will measure unemployment as the unemployment rate which it is a better way to calculate it. This way we will adjust the data to the fluctuations in population numbers which might otherwise cause us to think the problem is better or worse than it actually is.

It is calculated as

$$\text{Unemployment rate (\%)} = \frac{\text{Unemployed workers}}{\text{Total labour force}} * 100$$

Where the unemployed workers are people that are able to start working within a fortnight and showed that they are willing to do so at least in the last 4 weeks.

Total labour force is the number that represents citizens that are able to work. Both people that do not and those that do work are counted.

But even this calculation is not a perfect representation of reality as it does not account for people that are working in prisons, people that have been discouraged from work, people that are self-employed or are seeking self-employment.

2.1.4 Factors affecting unemployment of university graduates

The factors that will affect the employment of graduates is going to belong to the frictional and structural types of unemployment.

By the term (university) graduate we mean a person that has completed his or her studies in the last two years. Unemployed graduate is a person that has been actively seeking work, is able to work but was unable to find it.

The underemployment of university graduates could be defined as the difference between the aspiration of graduates and the employment opportunities which are offered. This number declines with time, as students find jobs that are related to their chosen profession and as they gain experience they are able to find employment easier than before.

The young take the brunt of economic crisis as the employers would rather have experienced workers than inexperienced ones that need to be supervised and trained. The employer also prefers workers that have certain work habits which students that did not work during their studies do not have. It is quite common that fresh graduates are dealt with as a person with minimal education – both with their payment and the way they are talked with.

A graduate that is looking for a job after his graduation is also at a disadvantage to a colleague that started to look during the school year. This kind of a person has a limited number of options and the best one would be to get a job through his social connections as that is the only thing (except his degree) that he can utilise.

Overall if graduates do not have experience in the field it is very hard for them to find employment and they often choose to work in a field that is different to their degree as they need money to support their new households.

2.1.5 Do multicultural learning opportunities help fight unemployment?

A multicultural atmosphere teaches students to accept people with different habits, thought processes which make them better at cooperation with differing people and work around differences which could create an environment negatively affecting productivity. These people are also more aware of possible faux-pas which could occur (or they have already occurred) and so they are better able to prevent them from happening.

2.2 Possible factors responsible for universities' cultures

2.2.1 Professors

Being a professor is the highest possible academic rank at universities and is a great privilege in the Czech Republic. These people are very often in a position where they decide the study plans of their department or they can even be found at managerial positions in the universities' schemes. They conduct their own research or work as consultants and teach under-graduate, graduate and professional courses in their field of expertise. They also get in contact with students as their supervisors during the students' work on dissertations or thesis or even as a guide through their academic path.

One becomes a professor by being nominated by their academic peers and then decorated by the president of the Czech Republic. Therefore the number of employees with the professor status reflects on the academic status of a university.

As these people seem to be the pride of the university then they must be an essential part of its culture, therefore one of the questions of this thesis will be – does the number of professors under the University's employment affect the unemployment of its graduates?

2.2.2 Associate professors

These people have the right to teach or lecture and this position is below the full professorship one and is equivalent or above the "associate professor" which is used in Western European countries. These people are also able to independently do a research or publish in scientific/academic publications.

These people get into contact with students during lectures, seminars and also influence them through assignments. They are included in the analysis as they are on the path to become a professor and are quite influential with their dealing with students.

2.2.3 Researchers

These people do work on research led by either professors or associate professors by assisting them with different tasks starting from collection of data, administration to making sure everything is on time. These people can also come into contact with students but only if they want to or are asked to by their boss. They help create academic and scientific research that helps elevate the academic standing in the world. Researchers can be also students at the same time so they gather experience while studying and have the opportunity to work at the university after they finish their studies.

2.2.4 Graduates

The number of graduates is affected by many factors – location of university, prestige, reputation and history, study programs offered and difficulty of studies. It is also affected by the growth of population. In this thesis we will concentrate on studies of economics and related subjects from the Czech University of Life Sciences, Charles University and University of Economics in Prague.

2.2.5 Foreigners

The mixing of cultures should positively prepare people how to deal with unexpected situations will less stress as you can step away from a situation and think about it from different points of view than is your mind-set that has been created by the culture you grew up in. Consulting a foreigner also offers a new perspective on issues.

2.2.6 Czech students engaging in ERASMUS program

These students create multi-cultural bonds and they learn how to deal with unexpected situations that they have to deal with mostly on their own. This makes them more competitive and attractive to employers as their participation shows a level of independence other candidates that didn't live abroad have. Living abroad also usually means this person has a certain level of communicational skills which is essential in most workplaces, the knowledge of a foreign language is also a bonus.

2.3 Minimum Salary

The minimum salary is the minimum amount of money the employer is obliged to pay to the employee for the work done. This is under control of the government and its legal provision can be found in the Labour Code. It is meant to protect both the employee and the employer with a written contract from foul play. It is meant to help the least educated and workers to maintain a certain standard of living which would minimalize their need to rely on benefits.

Ideally, the limit would be set at the equilibrium but that is not possible as this point is unreachable in reality and also constantly changing. Even though one would think the reason for implementation is to eradicate poverty it is not completely so. The effect on poverty is not big enough to manage that. The actual reason is to help support people so they do not have to lean so heavily on benefits.

In the USA the raise of the minimum wage from $7.25 to $10.10 per hour would help from poverty only around 900,000 citizens which is a relatively low number from the 16.5 million under the poverty line (Halvorson, C., 2014) This is because most people that work for the minimum salary usually have more than one job (Pettinger, T., 2016).

FIGURE 1. Minimum salary

Source: Author's own figure

19
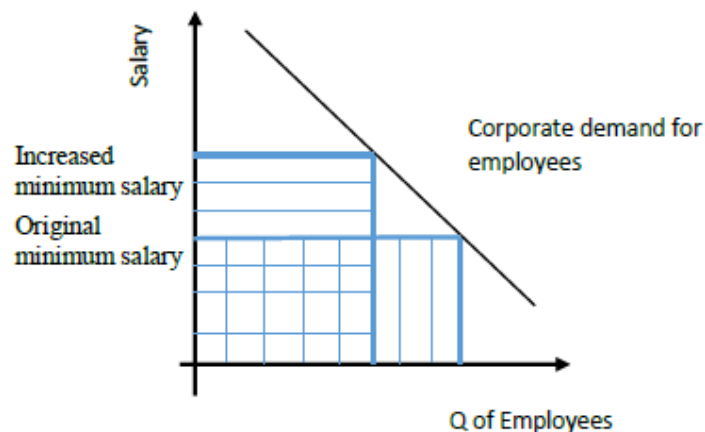
2.3.1 History

The reason for the existence is actually completely opposite of what it is now. The first thought behind this is in the Ordinance of Labourers (from the 1349) where King Edward III. set a maximum wage. The reason behind it was the black plague which decimated the population and working hands were hard to find and come by.

In history the raising of the minimum wage has been used as an undercutting method – pricing out competition and ensure employment positions for white people, pricing out less educated black people in the process. This has happened in African colonies and USA both and while the intention might not be the same the fact that untrained and unexperienced workers will be the most affected.

2.3.2 Reason for implementation

The minimum salary is meant to motivate people to get employed, stop receiving social benefits and therefore stop burdening the state's budget. Not only does the state have to pay for social and health insurance but the fact that the citizen is not working means that there is potential loss in the economy.

The employee is protected because he cannot legally get less money for the work done regardless of prejudice. It sets a minimum living standard and creates a sort of a safety net which leads to a better mood in general. Another advantage would be that it so helps against undercutting which means that the price is artificially lowered to eliminate competition and thus creating a type of a monopole.

If someone says that having the same limit in different time periods is not smart and that this rigidness could lead to even more trouble they would be right but this problem could be prevented by regular and frequent re-evaluations.

As the minimum worker has more money to spend, he will. This will cause the economy to be more alive. This minimum raise will cause a ripple effect through the money multiplier, business will produce more, earn more, and hire more.

2.3.3   Reason why not to implement

As with everything we have two points of view. The first group is saying that to set a minimum wage is good, that is helps against poverty, crime. The second one says that it is not a good idea and that it actually harms the economy.

The less productive workers get paid the same as a productive worker (at the minimum salary position) and hence the employer of these people has a certain loss which could have been prevented by individual adjustments of minimal payments. In addition, employers may hire fewer employees for the same amount of work because of the increased salary expense with a minimum wage. This can create both decreased productivity as well as increased stress and responsibilities for the employees.

The employer will look more at the age, skill sets, experiences or even social connections of workers which could lead to an automatically worsening position to people that have newly entered the labour market. Nobel laureate Gary Becker argues that "a higher minimum [wage] will further reduce the employment opportunities of workers with few skills."

Because the costs of production for employers rises, they will move this burden to customers through prices of the product which could lead to a Cost-Push Inflation or it could cause for the black market to rise. The black market situation would mean that the state will lose the money from taxations and would probably have to still pay for the social and health security which would be a double loss.

2.3.4   Raising of the minimum wage

Artificially modifying the price for labour will lead to reduced demand for unskilled employees while increasing the number of unskilled unemployed citizens at the same time.

It has been found in 64 studies from the USA that an increase in the minimum wage will decrease the turn-over rate of employees (Waldrop, S. (2015) which could positively affect their mind-set as humans like stability. This could cause the efficiency of the system to increase.

In theory, the rising of a salary will increase the happiness of workers and thus boosting their productivity but we must think about the employees that have started with the previous minimum salary and entered this place of employment before them. So in practice the first employee starts from a position that pays $5/hour, he gets a raise to $6 for his year of productivity. At the same time he gets the promotion (which could have included some extension to his responsibilities) there enters the second worker but because the minimum has now been set at $6 he gets the same amount of money as the first employee. This will cause the first employee to be demotivated, his efficiency and productivity fall. It might even cause animosity at the workplace. Therefore we would have to raise the salary of other employees with this in mind.

2.3.5   Inflation

Inflation is a devaluation of currency, the purchasing power of a currency is smaller than before in case of a rise of inflation. It is as old as there were coins to dilute and money to be created. Old kingdoms melted the (usually golden) coins down, diluted the gold with other metals (silver, copper) and put them back in the market at the same value even though the actual value of the coins fell down.

Inflation is ever present and at a slow rate is not actually such a big problem. If it is correctly predicted it can be dealt with by interest rates or rising of salaries. The real question that should concern us when talking about inflation is – is it rising faster than our salary does?

Problems arise when one of these situations occurs – 'inflation of our home country is higher than that of other countries' means that our domestic product will not be as able to compete on the international market, people with fixed incomes will have their lifestyle standard devaluated, if people cannot predict the future behaviour of inflation they might be less likely to borrow money, which would lead to less investments and the economy would suffer.

It is also possible that if the inflation rate is lower than a creditor believed it would be the borrower will pay less money for his debt.

There is not a universally agreed upon theory behind the cause of inflation as it is a combination of multiple causes but there are two main theories that concern the topic of this paper.

The Demand-Pull Inflation theory which says that the cause is too much money in the market that are trying to buy too few goods. Speaking in economic terms the demand is rising while the supply is staggered which leads to rising prices. This phenomena can be observed in growing economies. The first notable case of this is in the Habsburg Spain from the end of the 15th century to the middle of the 17th century where the prices rose up to 6 times the original price due to the precious metals imported from the New World.

Cost-Push Inflation theory that explains that when companies' costs go up, they need to increase prices to maintain their profit margins. Increased costs can include things like wages, taxes, or increased costs of imports. This theory is going to be more discussed in relation to the Phillips curve.

2.3.6 Minimum salary and Dead Weight Loss graph

FIGURE 2. Dead Weight Loss
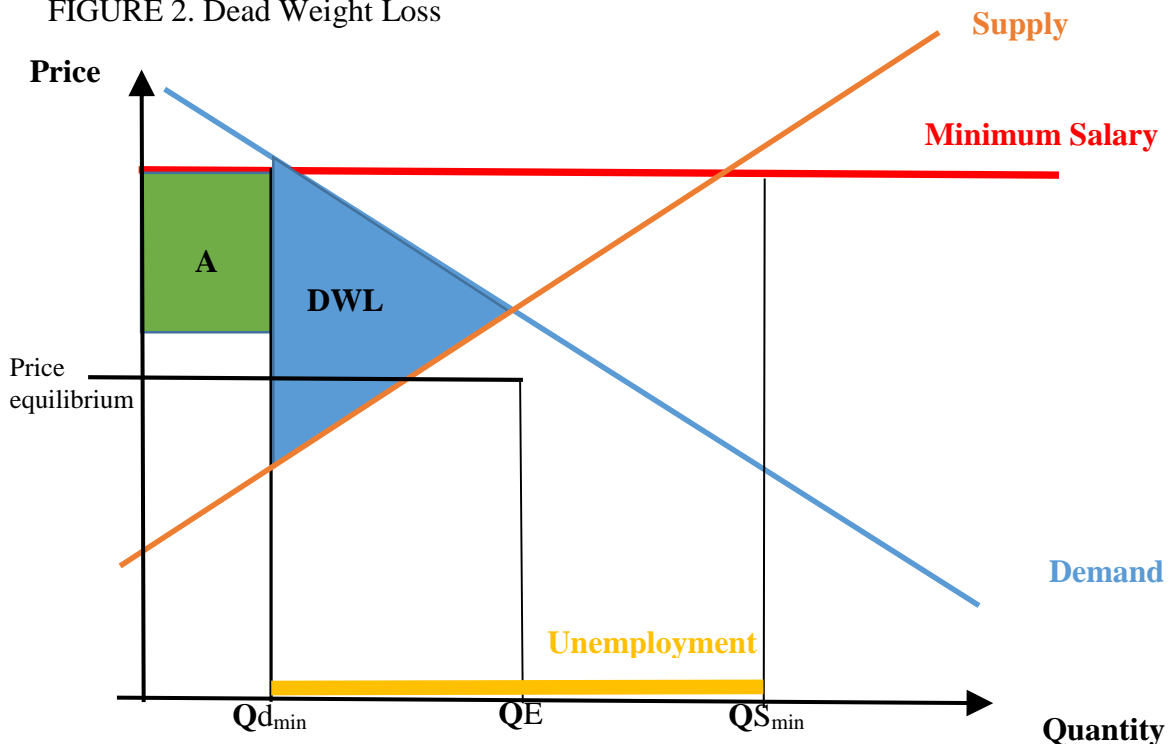
Source: Author's own figure

2.3.7 Minimum salary and Dead Weight Loss graph explanation

As we can see the state's interference by issuing a minimum salary caused the system to be inefficient which is represented by the DWL (Dead Weight Loss) triangle.

The green area A represents the potential loss due to job hunting which is higher after the minimum salary policy implementation.

The area between Qd_{min} and QS_{min} represents unemployment where the workforce offered by potential employees is higher than the jobs offered by the employers.

If the minimum salary line is moved up, the amount of unemployed people will rise and the deadweight loss will grow. The optimal place for the minimum salary would be at the price/quantity equilibrium which is, however, only theoretical and so is unattainable.

2.3.8   The Phillips curve

In 1958 Williams Phillips wrote a paper named *The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957* which describes a relationship between unemployment and changes in salary. On grounds of this it was observed that the relation between unemployment and inflation is inverse – when unemployment is high, inflation was low and the other way around.

The theory behind this curve is based on the aggregate supply and demand model and is a trade-off between unemployment and inflation. As the demand for workforce rises, so do the demands of the workers for a rise in their salary. But it does not always work.

The theory can be best observed in reality when the unemployment rate gets lower than the natural unemployment rate.

2.3.9   The university culture

The culture that is prevalent on academic ground shapes its future graduates whether they are aware of it or not. It is created by the employees, students, location and projects that are available to both the students and employees or even by student clubs. For the author of this thesis the culture was the deciding factor when choosing which university to attend.

2.4   Graphs

2.4.1   Graduates unemployment

This graph has been created from the data available from the schools themselves.

FIGURE 3: Graduates Unemployment
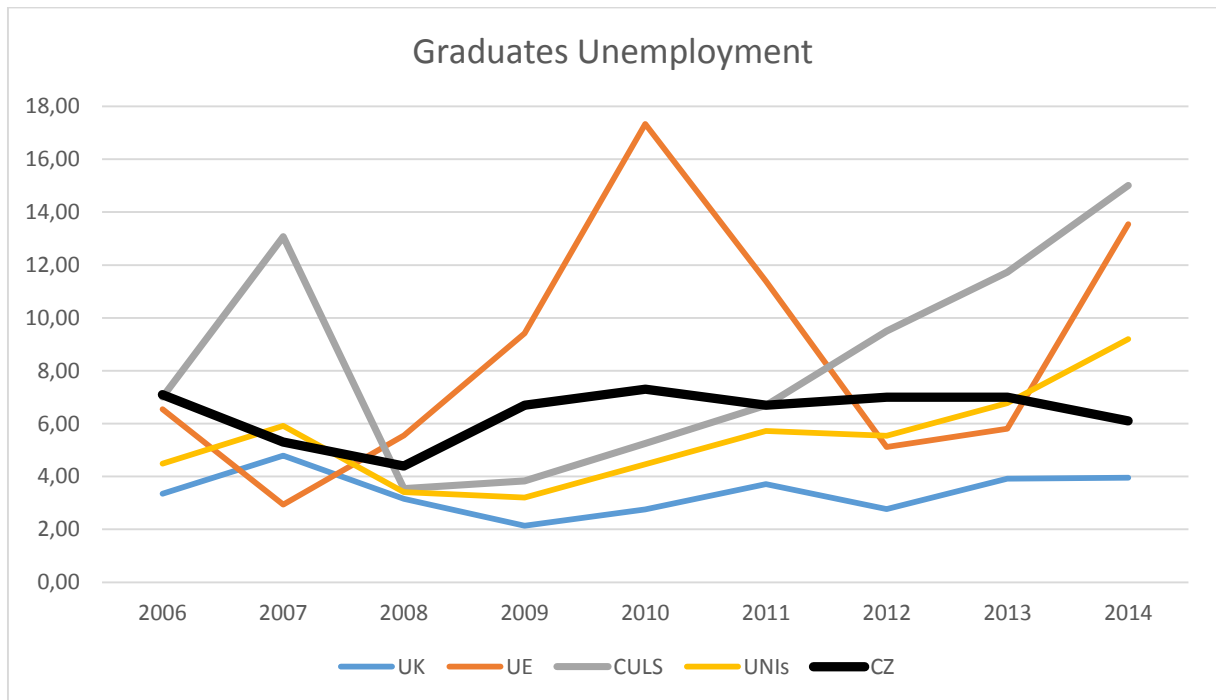
Source: Author's own figure

2.4.2 Minimum salary

This is the representation of the development of the minimal salary for the Czech Republic. It is quite steady and changes only occasionally as the politicians usually do not have the time to change it as often as the free market changes its situation.

To set it correctly a thorough analysis of the market as a whole is needed, as well as a prediction of inflation and unemployment.

FIGURE 4: Minimum Salary Growth

Source: Author's own figure

2.5 Interpretation of the graphs

2.5.1 Unemployment

The figure 3 represents the unemployment of bachelor graduates from the Charles University (UK), bachelor graduates of University of Economics, Prague (UE) and bachelor graduates of Czech University of Life Sciences (CULS). The graph also shows data representing the average unemployment from all universities in the Czech Republic combined (UNIs) and the unemployment of all citizens in the Czech Republic (CZ) from the year 2006 to 2014 (as up to date as is the data available).

We can see that the economic crisis of 2009 has affected all employment rates but all in different measure.

2.5.2 Graduates unemployment

As we can see from the figure 3, the unemployment of bachelor graduates is actually lower than the average unemployment with the exception of the years 2002 to 2004. From the year 2005 and onwards the line keeps at least 2% under the average unemployment in the Czech Republic.

This means that graduate students are more successfully finding and keeping a job then the rest of the population or that the employment opportunities for graduates are more closely linked with the graduates' expectations then with the expectations of the rest of the population in the Czech Republic.

The rise of unemployment from the year 2009 can be attributed to the economic crisis that hit the Czech Republic.

2.5.3 Overall rates of unemployment

The rate for all universities is smaller than the rate for all citizens in the Czech Republic except the year 2007 (5.92% for all universities and 5.30% for CZ) and from 2013 on where the university average overcame the CZ at 7% and rose to 9.19% in the year 2014. We can say that from the year 2013 on the university degree lost the overall edge held over people without a diploma at the job market.

2.5.4 Charles University

The UK unemployment rate stays under the state average throughout all shown years.

The unemployment of bachelors from (UK) is the less volatile one from my choice of universities. The maximum rate is 4.79% while the minimum is 2.14%. The maximum rate is in the year 2007 and copies the spike in overall rate for all universities combined.

While the rest of the university graduates had a bit more trouble finding employment during the economic crisis of 2009, the bachelors from (UK) were actually more successful than the previous 2 years. This has changed though and the trend went to a steady rise of the unemployment with a slight dip.

2.5.5 University of Economics, Prague

This curve is the most volatile. While the rate decreased from 2006 to 2007 (2.94%) it started to rise sharply until 2010 (17.33%) where it once again rapidly fell till 2012 (2.77%). It is prudent to mention that in the year 2007 these university graduates had the best employment rate, even bigger than the average of all university graduate and the average employment rate in the Czech Republic

This data seems to be out of the ordinary and seem false because of the big change in the rate. If this data is true than it could mean that this university does not prepare its pupils well enough to be on the same level of competitiveness as the rest of the universities. These people are less likely to find a job and even more so during a recession/crisis. The big spikes show that these people's competences could be useful only during certain periods of time that repeat themselves.

2.5.6 Czech University of Life Sciences

There is quite a big spike the years 2006 (7.01%) to 2007 (13.7%) and back down in 2008 (3.54%). From this year on the unemployment rate is steadily rising by around 1.5-2% a year where the last observed year 2014 showed a rate of 15.01%. This means that the competitiveness of these graduates in the job market is steadily falling.

2.5.7   Unemployment and minimum salary

When we compare these two graphs (Figure 3 and 4) there appears to be a slight correlation between them.

The rise of the minimum salary from year 2006 to 2007 could correspond to the slight increase in unemployment shown in UK, CULS, and UE though it seems to affect neither the UNIs rate nor the average CZ.

Until the year 2012 the minimum salary is unchanged but there is slight accelerated increase of unemployment with the exception of UE where the rate went through a big spike.

Another increase in the salary was from the year 2012 to 2013 where, once again, there is an increase (this time a bigger one) of the unemployment rate for all chosen universities except the UK which remained constant. The unemployment in the Czech Republic decreased a bit.

3. Practical Part

3.1 Regression analysis

The regression analysis is a statistical tool to judge the effect a relationship between several different factors. It is also used as a method for forecasting and prediction of a phenomena. The relationship needs variables and a dependable.

More accurately the regression analysis shows how much of a variable has an effect on the changes of a fixed dependable. The relevant factor can be found out thought the P-value which has to be smaller than 0.025 (in the case of a 95% confidence level) to be statistically relevant.

In this regression analysis we will have the formula as follows:

$$U = W + X + Y + Z$$

Where **U** represents unemployment
W represents the expected value of the intercept, if all variables were set to 0
X, Y, Z are the variables that differ for each scenario.

3.2 Analysis of relevant factors through the regression function

The analysis has been done through the function regression in Microsoft Excel 2007 which is a statistical tool for estimating relationships between variable. The y variable has been set as the unemployment rate for the given university while the x variables were the relevant factors from the corresponding university. The confidence level has been set at 95%.

A problem that had to be faced is that the result varies depending on the variables chosen. As an example – if there were just 3 factors chosen: number of professors, foreigners and outgoing students for the Erasmus program then the results shows that the number of professors has a very significant impact on the unemployment of bachelor graduates.

But if we chose to focus on the number of professors, associate professors and foreigners then the analysis shows a significant impact from the number of foreigners attending the university. This changes the results quite significantly and so the factors will have to be chosen very carefully.

For this reason we will have two different regression analyses for each university and later we will compare the changes occurring because of the different grouping of the factors.

This first scenario will be the number of professors, associate professors and foreigners. The number of professors and associate professors as a representation of the academic achievements of the university (reputation) and the number of foreigners as a representation of international reputation.

The second scenario will be the number of professors, foreigners and outgoing students for the Erasmus program. This could show how much students get influenced by their peers from different cultures or abroad.

The factor 'Erasmus Programs' is focusing on the number of students that study in the Czech Republic that decided to take part in the ERASMUS program abroad. The reason for choosing the outgoing students is that these students will be the ones that are trying to find employment in the Czech Republic.

To make the understanding of the results easier here is a little instrument for better understanding. When we talk about a negative effect that means that the unemployment rate is decreasing so it is a mathematical negative rather than an economical one. Similarly when we walk about a positive effect that means that the unemployment rate is rising so it is, once again, a mathematical positive.

3.1.1 Charles University

Comparison of UK unemployment and changes in Minimum salary (Δ)

On this graphical representation we can compare the changes in minimum salary dictated by the political decisions and the unemployment rate of bachelor graduates of the Charles University.

In 2007 there has been quite a big change but following it we have a decrease in the unemployment rate. When the Δ are 0% the unemployment rate is changing and so it is not the only variable connected to this phenomenon. When there is the last recorded Δ from the year 2013 the unemployment rate is only slightly increasing and looks very steady.

Overall we can say that the minimum salary does not really affect the unemployment rate of the bachelor graduates from this university as the trends do not seem to be connected and almost looks like they could be doing the opposite. Why the opposite? Because we would anticipate an increase in unemployment when there is an increase in the minimum salary but the opposite seems to be true in 2 out of 3 increases that we can see on this graph.

FIGURE 5: Unemployment and Changes in Minimum Salary Charles University
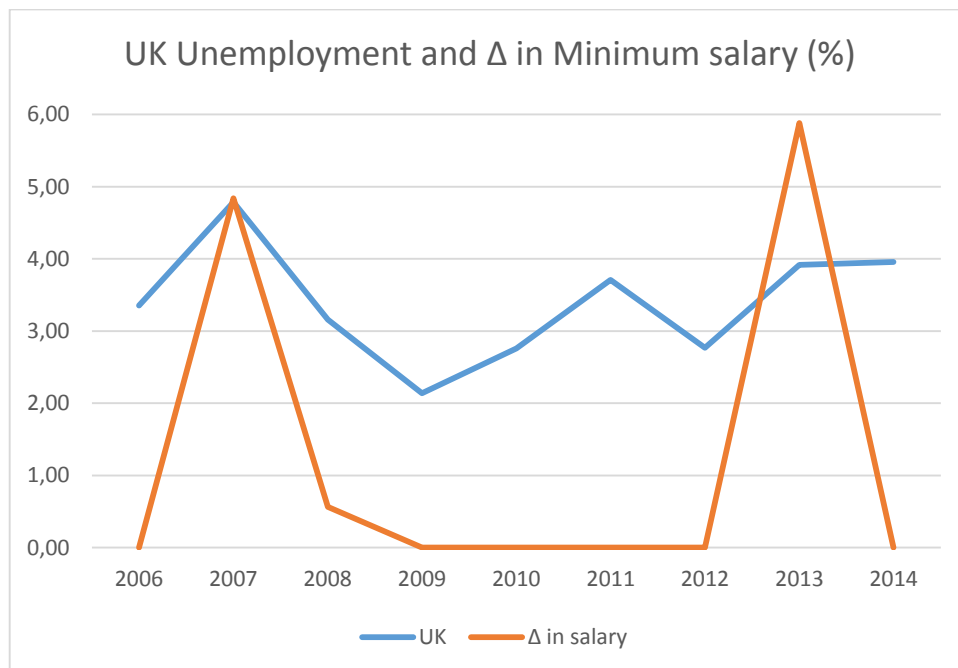
Source: Author's own figure

First Scenario

No factor had the P-value at a lower level than 0.025 and so we can say that there is no significant effect of either of the factors professors, associate professors or foreigners. The lowest value has been the one for the number of foreigner at 0.04949 followed by the number of associate professors at 0.1363. For the sake of the work we can at least look at how the factors affect the unemployment rate – look at their position and the influence they have on the culture of the university.

If the values were at a significant level we could say that from these three factors the number of foreigners affects the unemployment rate of graduates the most.

But as the coefficient is positive, it actually affects it positively (in an opposite way than it was previously speculated in this thesis) – with each foreigner the unemployment rate would rise by 0.0028%. This is quite a small number – out of 35 000 graduates only 1 is negatively affected by the number of foreigners at the university and so it is no cause for worrying.

If one thoughts about this it would start to make sense – foreigners are registered as regular students hence they will graduate as such. But they will seek employment in their home country, increasing the unemployment rate here.

The unemployment rate of bachelor graduates for this university has the following formula in this (first scenario) system:

$$U = -0.480997 - 0.041558X + 0.0901947Y + 0.0028353Z$$

Overall there is no factor which would significantly change the unemployment rate and two out of 3 chosen factors actually raise the rate.

TABLE 1: Charles University, Scenario 1

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.480997	1.0690586	-0.449926028	0.671598995
Professors	-0.041558	0.05742977	-0.723636869	0.50171542
Associate professors	0.0901947	0.05085461	1.773578624	0.136317754
Foreigners	0.0028353	0.00109939	2.579026203	0.049490496*

Source: Author's own figure

Second Scenario

At the second scenario we have better results - the number of professors has a P-value of 0.0268 followed by the foreigners at 0.1649. This means that the number of professors affects the unemployment rate of their former students in this chosen system.

But as the coefficient is positive, this would mean that an increase in the number of professors will increase the unemployment rate. Hence it would be prudent not to employ more professors or if the aim is to decrease unemployment to have them more focus on the path needed for their graduates to get employed instead of focusing on academic research.

The coefficient for professors has changed from the coefficient in the first scenario – this could signify that when the professors are included in the academic culture, they have a negative influence on the unemployment rate while when they are introduced in the student sphere then they have a positive influence on the unemployment rate.

The number of foreigners and Erasmus students also affect the unemployment rate in a negative way. This could mean that the Czech students that decided to study through the Erasmus programme have decided that they will seek employment abroad or they have a longer study period with the end of it at an inconvenient time in which it is harder to find employment.

The unemployment rate of bachelor graduates for this university has the following formula in this (second scenario) system:

$$U = -1.01007 + 0.065309X - 0.001921Y + 0.0013541Z$$

Overall there is no factor which would significantly change the unemployment rate and all of the three chosen factors actually raise the rate. The coefficient is usually so small that it would not be given a big priority even if it were statistically significant.

TABLE 2: Charles University, Scenario 2

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-1.01007	1.436765496	-0.70301	0.513422
Professors	0.065309	0.021065547	3.100271	0.026845*
Foreigners	0.001921	0.00118177	1.625837	0.164913
Erasmus	0.001354	0.000918426	1.474423	0.200375

Source: Author's own figure

Conclusion

The change in the significance of the professors is quite big – from 0.5017 to 0.026. It also changes from a negative coefficient to a positive one. And so from a negative output it changes to a positive one – it is the most significant factor which increases the unemployment rate. This could mean that the added value that these professors bring to the university actually matters and makes an impact on their students when grouped with factors that have no impact on academic reputation.

It changes it in a way that would actually increase the unemployment rate so we could say that the economic verification is not valid. Or that the professors are more focused on their academic work and not on the future value their students could bring to the work market if they are properly prepared. With more conclusive results we could even say that the hiring a new professor would be an unnecessary expenditure as they would lower the chances of their students to be employed and they would cost the university more money.

We could say that the reputation that the employees create for the university makes a difference to employers and that it could, potentially, make a difference when there is a choice between two candidates with the same skills.

3.1.2 University of Economics, Prague

Comparison of UE unemployment and changes in Minimum salary (Δ)

On this graphical representation we can compare the changes in minimum salary dictated by the political decisions and the unemployment rate of bachelor graduates of the University of Economics, Prague.

In 2007 there has been quite a big change and following it we have an increase in the unemployment rate which is quite significant. When the Δ are 0% the unemployment rate is changing rapidly and it is increasing until the year 2010. After this year it is rapidly falling down again. When there is the last recorded Δ from the year 2013 the unemployment rate is once again rapidly increasing.

Overall we could say that the minimum salary does affect the unemployment rate of the bachelor graduates from this university as the trends seem to be quite significant. The unemployment rate increases after all changes in the minimum salary and we cannot say that it is steady as the only year that the change in the unemployment rate does not rise over 1% is from the year 2012 to 2013.

FIGURE 6: Unemployment and Changes in Minimum Salary UE
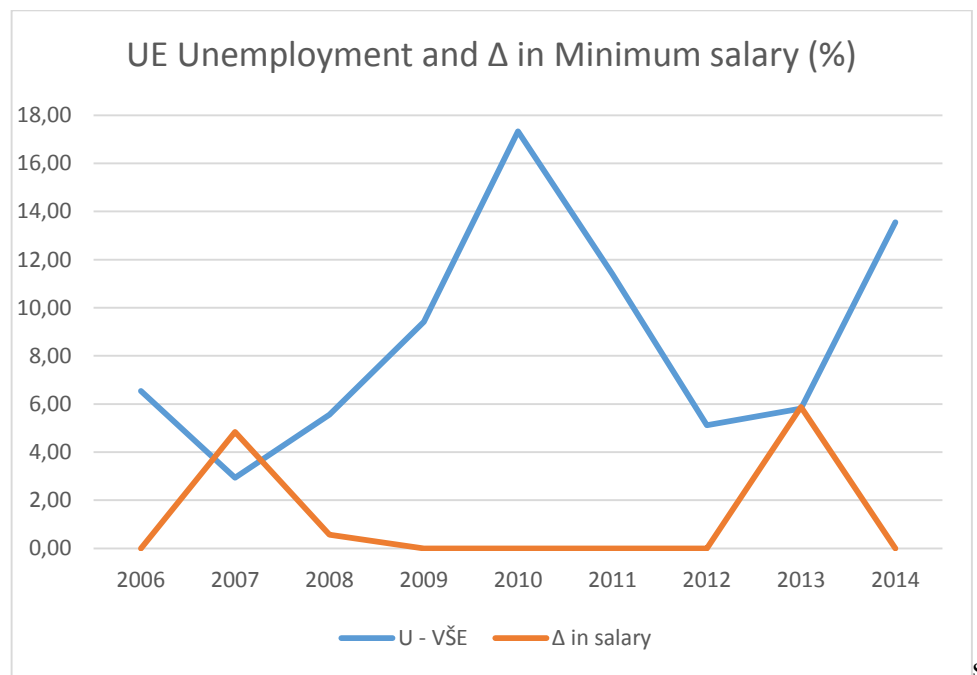
Source: Author's own figure

First Scenario

No factor had the P-value at a lower level than 0.025 and so we can say that there is no significant effect of either of the factors - professors, associate professors or foreigners but the factor with the lowest score is 'Professors' with the value of 0.5154. What is interesting though is the fact that with an increase in professors we have an increase in the unemployment rate as the coefficient is positive.

This could be caused because they would be more focused on their academic work than on teaching their students and preparing them for the job market.

In this scenario it would not be prudent to accept anymore professors as it increases the unemployment rate which in turn would decrease the reputation of the school, lead to lesser interest from future students and possible partners.

The only negative coefficient belongs to the factor associate professors, but its P-value is the highest. The coefficient is also quite small, which means that the effect an increase in associate professors would be quite small.

The unemployment rate of bachelor graduates for this university has the following formula in this (first scenario) system:

$$U= -28.1612 + 0.304882X – 0.03661Y + 0.00951Z$$

Overall there is no factor which would significantly change the unemployment rate and two out of 3 chosen factors actually raise the rate.

TABLE 3: University of Economics, Scenario 1

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-28.1612	106.3549	-0.264785326	0,801744
Professors	0.304882	0.435844	0.699519404	0.515425*
Associate professors	-0.03661	0.74515	-0.049135048	0.962714
Foreigners	0.00951	0.016351	0.581584242	0.586079

Source: Author's own figure

Second Scenario

The values for the second scenario do not come close to being at a significant level either but the factor with the lowest number is, once again, 'professors' with the value of 0.5103 which is still too high to be statistically relevant.

Once again the coefficient is positive, which means that as the number of professors increases, so does the unemployment rate. The increase would be by 0.33% which is slightly more than in the first scenario and as an effect that a single person has it is a big influence.

All the factors have a positive coefficient. If the values were significant than the most change would be done by the factor 'professors', the rest of them have a very small coefficient and as such would not be important enough to deal with if the school decided to do something about the unemployment rate.

The unemployment rate of bachelor graduates for this university has the following formula in this (second scenario) system:

$$U = -31.62139705 + 0.33456084X + 0.006374064Y + 0.002934596Z$$

Overall there is no factor which would significantly change the unemployment rate and all chosen factors actually raise the rate, though two out of these in a neglectable way that would not be a cause for worry even if they were statistically significant.

TABLE 4: University of Economics, Scenario 2

	Coefficients	Standard Error	t Stat	P-value
Intercept	-31.62139705	32.10654	-0.98489	0.369907
Professors	0.33456084	0.472285	0.708387	0.510354*
Foreigners	0.006374064	0.023609	0.269987	0.797959
Erasmus	0.002934596	0.017453	0.168143	0.87306

Source: Author's own figure

Conclusion

In both scenarios the lowest value belongs to the number of professors and so we could say that the academic output and the reputation the professors create is more important to employers than the possible cultural knowledge and awareness foreign experiences might bring.

As the coefficient is positive in both scenarios, it actually seems as if the employers took the academic output which had the best result as a detrimental sign rather than a positive one as with each increase in the number of professors there is a corresponding increase in the unemployment rate.

Except for one factor all the coefficients were positive – the rest of the chosen factors actually raise the unemployment rate which is an interesting and surprising fact that goes against the theory of this bachelor thesis.

But because the probability value is quite above the significance level, none of these observed factors actually matter statistically-wise. None of the factors have an effect on the employment levels of graduates in this scenario according to the data collected and analysed.

3.1.3 Czech University of Life Sciences

Comparison of UE unemployment and changes in Minimum salary (Δ)

On this graphical representation we can compare the changes in minimum salary dictated by the political decisions and the unemployment rate of bachelor graduates of the Czech University of Life Sciences.

In 2007 there has been quite a big change and following it we have a decrease in the unemployment rate which is quite significant – around 9%. But a decrease of unemployment actually goes against this thesis thought. When the Δ are 0% the unemployment rate is steadily increasing throughout all recorded years and each year this rate in increasing. The increasing change does not seem to be affected by the minimum salary as the change in unemployment rate does not seem to be significantly affected after the change in 2013.

Overall we could say that the minimum salary does affect the unemployment rate of the bachelor graduates from this university as the trends seem to be quite significant. The unemployment rate increases after all changes in the minimum salary and we cannot say that it is steady as the only year that the change in the unemployment rate does not rise over 1% is from the year 2012 to 2013.

FIGURE 7: Unemployment and Changes in Minimum Salary CULS
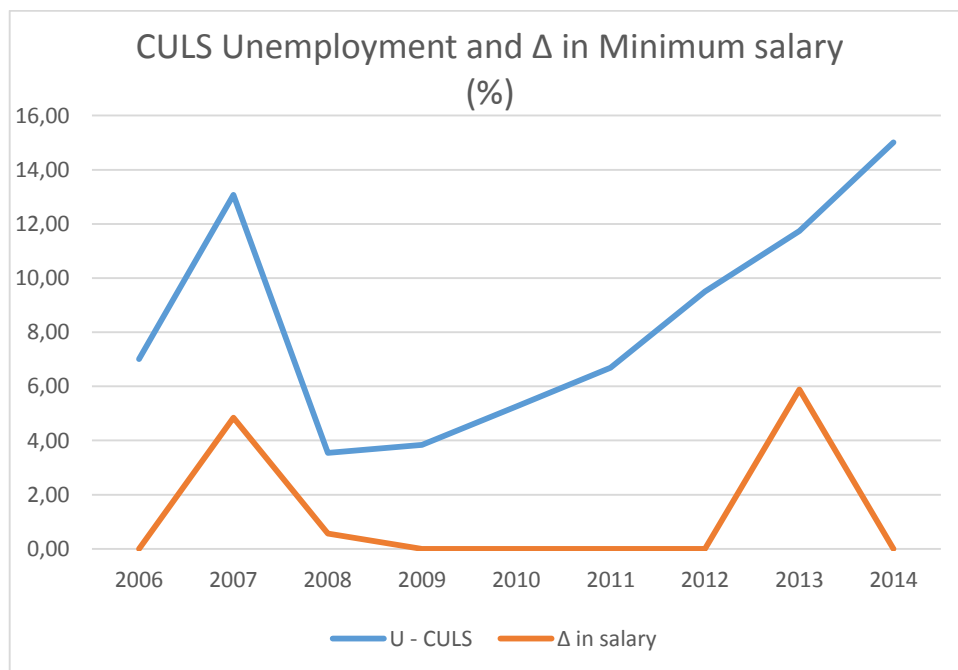
Source: Author's own figure

First Scenario

In this scenario we can see that a relevant value can be found connected with the number of associate professors at the university – P- value of 0.0215. This is the only time the number of associate professors had a bigger impact on the employment levels than the number of professors. This could be interpreted as the fact that the associate professors in CULS have a bigger impact on their students than in the other universities.

From the regression analysis it seems that with every increase of associate professors at the university, the unemployment decreases by 0.31%. This seems like a big and significant effect that a single person has on the employment success rate – if we had 1 000 bachelor graduates then 3.1 out of these would be successful in gaining employment just because there has been a single associate professor teaching them.

The rest of the factors have a positive coefficient which is, once again, surprising and goes against the initial theory that the number of professors and foreigners would have a negative relationship and hence would decrease it. The opposite seems to be the scenario, even though both of them are not even close to being at a significant level.

The unemployment rate of bachelor graduates for this university has the following formula in this (first scenario) system:

$$U= 7.48448 + 0.424432X - 0.31098Y + 0.012625Z$$

Overall there is one factor which would significantly change the unemployment rate and it also decreases it at the same time. The rest of the factors have a positive coefficient.

TABLE 5: CULS, Scenario 1

	Coefficients	Standard Error	t Stat	P-value
Intercept	7.48448	30.9983963	0.24145	0.818797749
Professors	0.424432	0.38841934	1.09272	0.324348139
Associate professors	-0.31098	0.09427694	-3.2986	0.021509828*
Foreigners	0.012625	0.00481961	2.61956	0.047123021

Source: Author's own figure

Second Scenario

There is no factor which has a value within the desired levels but the one with the lowest value is the 'Foreigners' one with the P-value of 0.1824. This means that the foreigners that come study at the CULS have a bigger impact on the employment levels than Czech students studying abroad or the reputation created by the professors. But because the coefficient is positive, this would mean that they have a negative influence on the unemployment rate – with each foreigner, the unemployment rate rises by 0.018%.

This goes against a theory previously mentioned – that any experience with a foreigner would increase the changes of successfully gaining a job. This could be caused by the fact that these foreigners are registered as regular students, they will graduate the same as our Czech students but they will go look for a job back in their home country hence increasing the number of unemployed graduates.

The other factors (Professors, Erasmus) have negative coefficients which is more according to the predictions made though it does not truly matter as the P-value is 0.3438 (for the lowest of them) which is not within the relevant area.

The unemployment rate of bachelor graduates for this university has the following formula in this (second scenario) system:

$$U= 41.48759459 – 0.247480094X – 0.0357469Y + 0.018620861Z$$

Overall there is no factor which would significantly change the unemployment rate and it has a positive coefficient at the same time. The rest of the factors have a negative coefficient which is more in tune with the theory of this thesis.

TABLE 6: CULS, Scenario 2

	Coefficients	Standard Error	t Stat	P-value
Intercept	41.48759459	63.02985	0.658221	0.539491
Professors	-0.247480094	0.661309	-0.37423	0.723581
Erasmus	-0.0357469	0.034201	-1.0452	0.343804
Foreigners	0.018620861	0.012033	1.547545	0.182407*

Source: Author's own figure

Conclusions

In the first option we have got a relevant result – the number of associate professors. This means that in the scenario that has been created they are a significant factor that affect the employment levels – and they affect it negatively which means that the unemployment rate decreases with every increase of the number of associate professors.

This could be an interesting fact to the university itself – with each new associate professor their students have a better chance of getting hired and being (presumably) useful in the real world rather than just in the academic world.

In the second one the academic side of the univerity's atmosphere and culture is not as significant and even the foreigners at the university do not seem to affect the unemployment levels. The professors also affect the unemployment rate negatively as did the associate professors in the first scenario. While the Czech students that leave for the Erasmus program affect the rate negatively, the foreigners affect it positively.

This could be caused by the fact that these foreigners are registered as regular students, they will graduate the same as our Czech students but they will go look for a job back in their home country hence increasing the number of unemployed graduates.

4. Conclusion

In conclusion, even though the minimum salary is mostly steady, the unemployment rate of graduates is actually rising. This can be for any number of reasons and though we do not see any correlation it does not mean that there isn't one. The reason we cannot see the connection might be because there exists a bigger issue (or reason) that affects the unemployment rates more than the minimum salary. One of the possible reasons could be that more and more people can achieve the status of a bachelor graduate while the number of jobs for this level of education has not risen at the same tempo.

What we can clearly see is that even though the unemployment rate for all citizens of the Czech Republic is steady and is, in fact, slightly decreasing in the last 4 years, the unemployment rate of bachelor graduates is actually increasing. This rate is quite alarming and shows that the universities do not seem to prepare their pupils well enough to be successful in the real job market.

Another reason could be that more and more people decided to attend university and gain a degree and with the influx of supply of graduates there is not enough job openings to satisfy their needs.

The analysis has, of course, been done on a model system that has been simplified and the results reflect that but it has been educational to work with real world numbers – from collection to analysis and evaluation of results.

In the analysis of the real world number that are made public by the universities themselves we could see that the it was mostly the number of professors that affected the unemployment levels – this could mean that employers have made their decisions based on the reputation of the school created by the professors though this trend of making hiring decisions based on reputation alone seems to be diminishing as the unemployment rate increases.

But even though the effect the professors seem to have on the unemployment rate is usually more significant than the influence of the other factors, it is frequently linked to a positive coefficient, meaning, that with an increase of professors at the university, there is an increase in the unemployment rate. This trend is quite surprising and shows that employers do not care as much about the academic reputation created by the professors.

The best results – meaning that they have been conclusive and more in tune with the thesis than the others - have been from the Czech University of Life Sciences. In the first scenario of the analysis we have a statistically significant result which says that with an increase of associate professors at the university there has been a decrease of unemployment for the graduates.

This could mean that the associate professors at this university are connected to the employment of graduates. They could be inviting employers to the University for a Trade Fair of jobs.

In the second scenario we do not have a statistically significant result but the closest result is that for the factor 'foreigners' which tells us that with every increase of foreigners at the university there has been an increase in the unemployment rate. This trend has also been followed in the other statistics for other universities.

The way that I interpreted this is the following – the foreigners study at the university as regular students and hence they are listed as graduates in the universities' databases. But as foreigners they are more likely to seek employment in their home country or another foreigner country, thus increasing the unemployment rate for the graduates in the Czech Republic.

5. References

Publications

Wilkinson, R. G. (1986). Class and health: research and longitudinal data. London: Tavistock Publications.

Moffitt, R. (2014). Unemployment benefits and unemployment. *IZAWOL*.

Diamond, P. (2013). Cyclical Unemployment, Structural Unemployment. *IMF Economic Review*, 61(3), pp.410-455.

Švarcová, J. and Horáková, M. (2015). The Macroeconomic View Of The Unemployment Of University Graduates In The Czech Republic. *International Journal of Business and Management*, Vol. III,(No. 1), pp.106-118.

Internet sources

Stephen D. Simpson, C. (2011). *The Cost Of Unemployment To The Economy | Investopedia*. [online] Investopedia.
Available at: http://www.investopedia.com/financial-edge/0811/the-cost-of-unemployment-to-the-economy.aspx [Accessed 14 Feb. 2016].

LiveScience.com, (2016). *Unemployment Proves Deadly, Health Study Finds*. [online] Available at: http://www.livescience.com/13578-unemployment-health-mortality.html [Accessed 12 Feb. 2016].

Investopedia, (2003). *Natural Unemployment Definition | Investopedia*. [online] Available at: http://www.investopedia.com/terms/n/naturalunemployment.asp [Accessed 13 Feb. 2016].

Halvorson, C. (2014). *The Pros and Cons of Raising the Minimum Wage*. [online] Wheniwork.com. Available at: http://wheniwork.com/blog/the-pros-and-cons-of-raising-the-minimum-wage/ [Accessed 17 Feb. 2016].

Pettinger, T. (2016). *Disadvantages of Minimum wages | Economics Help*. [online] Economicshelp.org. Available at: http://www.economicshelp.org/labour-markets/disadvantages-minimum-wages/ [Accessed 17 Feb. 2016].

Waldrop, S. (2015). *How Minimum Wage Impacts Unemployment | Investopedia*. [online] Investopedia. Available at: http://www.investopedia.com/articles/personal-finance/013015/how-minimum-wage-impacts-unemployment.asp [Accessed 18 Feb. 2016].

Mises Institute, (2015). *Yes, Minimum Wages Still Increase Unemployment*. [online] Available at: https://mises.org/library/yes-minimum-wages-still-increase-unemployment [Accessed 15 Feb. 2016].

Waldrop, S. (2015). *How Minimum Wage Impacts Unemployment | Investopedia*. [online] Investopedia. Available at: http://www.investopedia.com/articles/personal-finance/013015/how-minimum-wage-impacts-unemployment.asp [Accessed 14 Feb. 2016].

The Economic Times, (2016). *Deadweight Loss Definition | Deadweight Loss Meaning – The Economic Times*. [online] Available at: http://economictimes.indiatimes.com/definition/deadweight-loss [Accessed 15 Feb. 2016].

Dollarsandsense.org, (2016). *What's the relationship between inflation and unemployment? | Dollars & Sense*. [online] Available at: http://www.dollarsandsense.org/archives/2006/0906drdollar.html [Accessed 18 Feb. 2016].

Perry, M. (2013). *Let's review the adverse effects of raising the minimum wage on teenagers when it increased 41% between 2007 and 2009 - AEI*. [online] AEI. Available at: http://www.aei.org/publication/lets-review-the-adverse-effects-of-raising-the-minimum-wage-on-teenagers-when-it-increased-41-between-2007-and-2009/ [Accessed 18 Feb. 2016].

Data collected from websites of these institutes:

Czech Statistical Office
https://www.czso.cz/csu/czso/home [Accessed 28 Jan. 2016]

The Center for the Sducational Politics of the Charles University
http://www.strediskovzdelavacipolitiky.info/   [Accessed 28 Jan. 2016]

Ministry of Labour and Social Affairs
http://www.mpsv.cz/cs/871   [Accessed 28 Jan. 2016]