University of Life Science, Prague

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Diploma Thesis

Comparison of Czech and German Higher education

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Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

Bc. Mikuláš Regéczy, BSc

Economics and Management

Thesis title

Comparison of Czech and German Higher Education

Objectives of thesis

The main objective of this Diploma Thesis is to identify whether any relationship exists between investment by the State into Higher Education, and the rate of youth unemployment in both the Czech Republic and in Germany. Additionally from this research, similarities and differences between the systems of Higher Education in these two countries will be identified

Methodology

The review of current literature will begin with an overview of the systems of higher education in Germany and the Czech Republic. This will be followed by a descriptive and comparative analysis of sources of funding for higher education, and issues of youth unemployment in these two countries. Using these as a starting point, a hypothesis will be proposed and tested using data collected from official government sources, and supported by other data from reliable sources. Analysis will be conducted by means of statistical analysis and econometric modelling

The proposed extent of the thesis

Approx 60 pages

Keywords

GDP per capita, the rate of unemployment, Higher education, education system, fees, financing of Higher education, Share of GDP

Recommended information sources

Baldacci E, Clements B, Gupta S and Cui Q (2008) "Social Spending, Human Capital, and Growth in Developing Countries," World Development, 36, 1317-1341.

European Commission: Education and Training Monitor 2017 United Kingdom [online]. Luxembourg: Publications Office of the European Union, 2017 [cit. 2018-06-18]. ISBN 978-92-79-70061-3. Available at: https://ec.europa.eu/education/sites/education/files/monitor2017-uk _ en.pdf

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Declaration:

I acknowledge that I have written my Diploma Thesis on the topic “Comparison of Czech and German higher education” by myself and I have only used sources that are written at the end of the diploma thesis.

In Prague on _____

Acknowledgement

I am greatly indebted to my academic supervisor Ing. Richard Selby Ph.D., who supported my proposal for the topic of this diploma thesis.

Comparison of Czech and German Higher education

Abstract

The diploma thesis deals with comparing education systems of the Czech Republic and Germany. Above all, the diploma thesis illustrates what difficulties regarding the education both countries must overcome

It concentrates on mapping current education systems in the theoretical part. GDP, unemployment and the impact of education on the economic growth are included in the literature review. Nevertheless, the theoretical part also contains historical development of education of both countries and their financing. The funding programs in Germany and their development of fees are included in this part as well.

The practical part demonstrates whether there is a connection between the expenditure into the education and the youth unemployment rate. The OLS models and the observation data between 2008 and 2016 serve for investigating.

Germany spent more on the education than the Czech Republic. Above all, Germany demonstrates better economic indicators than the Czech Republic, such as GDP per capita or share of GDP on education. At any rate, the result was only statistically significant for Germany.

Keywords: GDP per capita, the rate of youth unemployment, higher education, education system, fees, financing of higher education, share of GDP

Srovnání českého a německého terciárního vzdělávání

Abstrakt

Diplomová práce se zaměřuje na srovnávání vzdělavacích systémů České republiky a Německa a demonstruje, jaké problémy týkající se vzdělávání, musí obě země překonat.

Zmapovává současný systém výuky v teoretické části. HDP, nezaměstnanost a vliv vzdělání na ekonomický růst jsou zahrnuty v přehledu literatury. Teoretická část zahrnuje historický vývoj obou statů a jejich financování. Financování programů v Německu a vývoje poplatků jsou v teoretické části.

Praktická část ilustruje, zda existuje vztah mezi financováním vzdělání a nezaměstnaností. OLS modely a data mezi rokem 2008 a 2016 jsou použity pro analýzu.

Německo financovalo vzdělání z větších míry nez Česká republika. Německo má také lepší ekonomicke výsledky nez Česká republika, například HDP na hlavu a podíl HDP na vzdělání. Výsledek ekometrickeho modelu byl statisticky významný jen pro Německo.

Klíčová slova: HDP na hlavu, míra nezaměstnanosti, vysokoškolské vzdělání, vzdělávácí systém, poplatky, financování vysokoškolského vzdělávání, podíl HDP na vzdělávání.

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GDP	Gross Domestic Product
ISCED	The International Standard Classification of Education
OECD	Organization for Economic Co- Operation and Development
K- 12 system	from kindergarten to the 12th grade
HE Institution	Higher Education Institution
GWK	Joint Science Conference
BMBF	Federal Ministry of Education and Research
DFG	German Research Foundation
OLS	ordinary least squares method

1. Introduction

Education is essential for fruitful and useful life. It enhances people´s value and prime education prevents poverty. Self-confidence increases with a useful education and the education makes people be more independent and more responsible for their lives. Having a degree from a university enhances people´s chances for a successful life. Due to the degree, the people are offered diverse opportunities in their lives. What is more, according to the disparate research, the education is one of the best weapons against myriad diseases.

As for the literacy rate, the literacy rate is 99% in the Czech Republic as well as in Germany. Nevertheless, the illeterate people deal with diverse difficulties that include writing, reading and counting. Owing to that it makes their life crucially difficult. Nowadays, the people are provided by education courses in the education center. They are demostrated how to face the health and hygienic issues.

Consequently, the obligatory school attendance lasts 9 years in both countries. As a matter of fact, Germans regard the school attendance as a crusially important period of people´s life for becoming a useful citizen of Germany. Education systems of both countries undoubtadly differ from each other. On the one hand, a German education system is somewhat more complicated by the effort to distinquish prime students from poor students. On the other hand, the Czech education system is simplier. It does not have remarkebly many types of schools. The German granding system is more elaborated. It not only awards clever students, it financially helps students who are in financial dificulties. Whereas the granding system is not profoundly developed in the Czech Republic.

Admittedly, Germany is one of the richest countries in the EU and it financially supports diverse education systems. Besides, Germany is one of the countries with the lowest youth unemployment rate in the EU.

As a matter of fact, the diploma thesis is focused on presenting two education systems.

Futhermore, the diploma thesis investigates wheter the youth unemployment rate can be enfluenced by the finacial expenditure into the education system.

2. Objectives and methodology

2.1 Objectives

The aim of this diploma thesis is to compare education systems of Germany and the Czech Republic with a focus on demonstrating the higher education system of both countries. What is more, several difficulties that both countries are challenged with are illustrated in the practical part.

Another goal of this diploma thesis is to examine whether there is a dependency of the unemployment rate on financing of the education.

2.2 Methodology

Methodology consists of two parts, theoretical and practical. Topics related to education systems are involved in the theoretical part. The secondary data is extracted from the scientific sources, such as research reports, books and web pages that regard to the education. Above all, the theoretical part demonstrates the whole concept of the diploma thesis.

The practical part is divided into two parts. GDP per capita, expenditure on education and share of GDP on education are depicted in the first part. The economic indicators are illustrated by figures. The youth unemployment rate is revealed in the second part of the practical part. It is demonstrated by the figure as well. It is examined in the practical part whether there is a connection between expenditure on education and youth unemployment rate. OLS method serves for this purpose. The data is obtained from Statista and Datenportal. Data is analyzed between 2008- 2016. The contemporary

difficulties that both countries must face are described by the descriptive analysis. The worries are reported by bmbf reports.

2.3 Research Question

For the purpose of this diploma thesis, the diploma thesis investigates the reply for the research question.

„What effect does the expenditure have on the youth unemployment rate?“

2.4. Research

Despite the education systems are profoundly complex, the econometric model does not include a great number of indicators for obtaining a prime result. What is more, the diploma thesis only deals with the observation data between 2008 and 2016. Futhermore, it commonly occurs that the dataset is not complete in specific cases. On the whole, the basic statistical methods serve for the research.

3. Literature review

3.1. Gross Domestic Product (GDP)

"Gross domestic product (GDP) is defined as a value of all goods and services that were produced in a country during a particular time. GDP is frequently calculated on an annually basis, but it can be calculated on a quarterly basis too." "GDP consists of all private and public consumption, government outlays, investments, private inventories, paid-in construction costs and the foreign balance of trade (exports are added and imports are subtracted). GDP is a broad measurement of a nation's overall economic activity". (Investopedia, 2018)

As far as GDP is concerned, it can be divided into GDP nominal and GDP real. Each of them is evaluated differently. "Nominal GDP measures all final goods and services´ value produced by a country. Real GDP measures changes of the price level during a year. It provides an accurate growth condition of the economy. It enables a country to obtain a precise picture of economy´s purchasing power and how much their economy is growing. As a matter of fact, GDP is calculated by three ways:

1) by the Expenditure

It considers the whole amount that is spent by citizens, businesses and the government. This spending is made domestically. This method does not pay attention who owns it. It commonly considers the expenditure. Whatever the case, it collects country´s nominal GDP in the private sector.

2) by the Production

It can be called value added. It assembles gross value added of all sectors. Beginning with the topic, the output must be determined. Subsequently, the goods and services are subtracted. Furthermore, they are depleted during the process to create the output. The

depleted goods and services are called as intermediate consumption. Gross value added is a difference between the output and the intermediate consumption.

3) by the Income

It calculates everything that was gained by the household and the company during a year. All obtained, such as salaries, income from the rent, interest income and revenues are counted as the costs on final products and services. Consequently, the GDP is determined by calculating all salaries, incomes from renting, revenues and interest income (Dornbusch, Fischer 1994).

3.2 The impact of Education on Economic Growth

The influence of education on economic growth has been a subject of bountiful research. The role of education for promoting economic growth is influenced by the role of educational quality. The improvement of growth rates seems to be profoundly large due to benefits of education. The research was reported by Hanushek, Wößmann (2008)

The length of compulsory education has a causal impact on regional labor mobility, which was examined by Growth Barro (1991).

Lee and Barro (2001) explored the positive influence of the education on economic expansion. Moreover, they demonstrated the effect of government expenditure on economic growth, which was largely indirect through its impact on improved education quality.

Economically stronger countries have it easier to eradicate poverty. The result of it was analyzed by Barro (1991). Positive influence of education on economic growth was evaluated by Temple (2001).

The normal extend of the school curriculum was reported by Krueger A and Lindahl M (2001). The research about “How many adults are educated” was analyzed by Romer (1990), Education Expenditure was examined by (Baldacci et al.).

However, several studies crucially contradict benefits of education. One of them was analyzed by Pritchett (2001). How the quality of the education influences economic growth was researched by Hanushek E and Kimko D (2000). The work of Hanushek E and Kimko D discovered a method how to measure the labor force quality. Mathematics and science serve for measuring their cognitive skills.

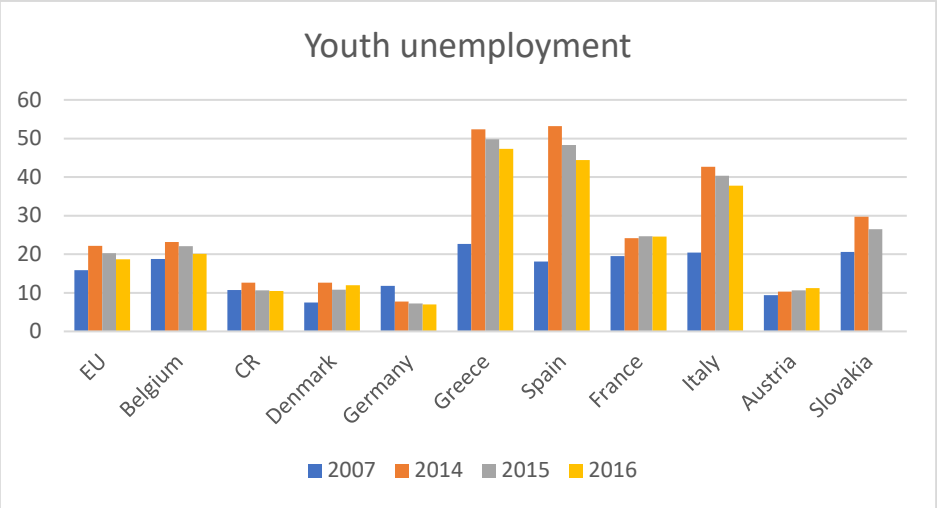
3.3 Unemployment

Unemployment occurs when a person who is actively searching for employment is unable to find work. Unemployment frequently serves as a measure of the health of the economy. One of the ideal measures of unemployment is the unemployment rate, which is the number of unemployed people divided by the number of people in the labor force. (Investopedia, 2018)

The high youth unemployment rate is a crucial topic in several European countries. Provided the balance is realized between investment into the education and the unemployment rate, then it may be possible to identify how to positively impact the labor market. Consequently, it helps its optimization. As a result, the negative impacts on the labor market are profoundly noticeable in bontiful European countries. (Urbánek,2005).

Several countries had a considerably high unemployment rate. Beginning with the topic, Spain´s unemployment rate was at 24% for a long period of time. Besides, the youth unemployment rate was 55.7% in Spain in 2014. Nevertheless, the situation was improving somewhat following years. Spain is only mentioned to reveal that the situation was slowly improving on the market. There might have been several factors why it was occurring. One of them might have been a process of optimization of the labor market. Similarly, France had a large worries with an unemployment rate of young people as well. The rate of unemployment of people under 25 years was over 25 percentage points in 2014.

Figure 1 Youth unemployment in %



Source: European Commission, 2018 own work

The unemployment rate increased in several European countries in 2016. It mainly occurred in Spain, Italy and Greece. The youth unemployment rate decreased to 45% in Greece in 2016. Thus the unemployment rate decreased somewhat in comparison with a year 2014 as it is illustrated in Figure 1.

As a matter of fact, the unemployment rate of the European Union was at 8,9 % in 2018. Namely, the unemployment rate of Spain was at 35 % in 2018. Thus the youth unemployment rate decreased over 20 % over last 4 years. The youth unemployment rate in Italy was at 31,7 % in 2018 and the unemployment rate in France was at 21,5 % in 2018. However, the youth unemployment in Greece was still one of the largest in Europe, which was at 42,3 % in 2018 (Statista, 2018).

For the purpose of decreasing the youth unemployment rate and maintaining the rate of unemployment in balance, three regulatory mechanisms were considered in this case (Vaisey,2006):

- introduction of tuition fees
- self-financing study

Consequently, both these regulatory mechanisms faced disparate criticism either from political interests or by public and students. The third approach did not act as a single theory. It was a mixture of both previous approaches. It was a detailed analysis of the impact of investment on the unemployment rate of young people. That analysis focused on the young people who were affected by expenditure allocated to the tertiary education. Furthermore, the analysis examined the direct impact of those expenditures on the unemployment rate of the young people. (Urbánek,2005*)*.

3.4 Higher education and its forms

To date there have been several alternatives how tertiary education can be defined. According to the Eurydice studies, it is a network providing information and analysis about European education systems and policies (EURYDICE, 2014). However, it is simply defined as studying at the university according to Merriam-Webster, which can lead to the accomplishment of the higher education.

ISCED is formulated as The International Standard Classification of Education. A key aspect of establishing the ISCED was with intention of being able to compare the education systems of countries in the OECD. It was established in 1975 (Unesco,1997). It presented indicators and statistics of countries´ education that were compared in the same way. It demonstrated concepts, definitions and classifications.

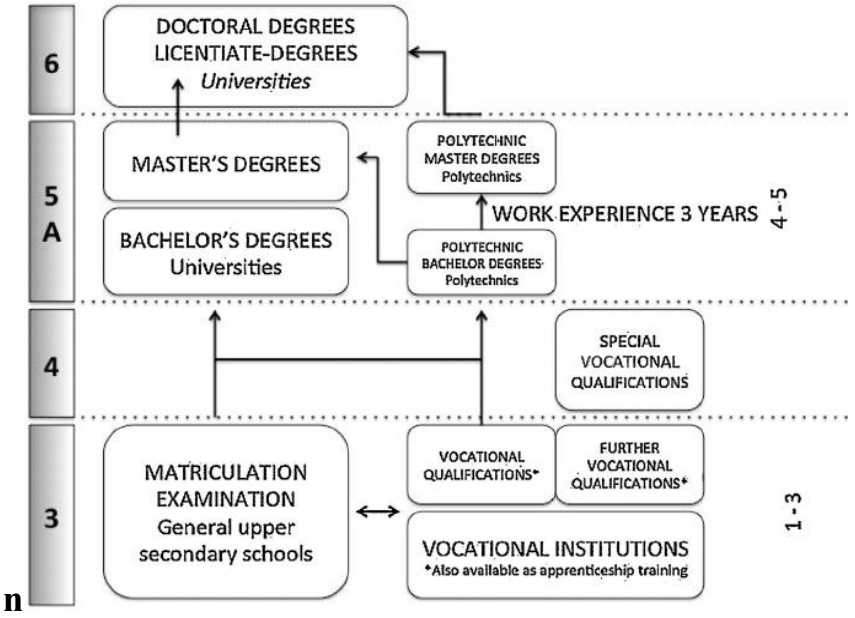
The methodology was updated in 2011 (Unesco,2017). Consequently, the programs of education (ISCED-P) were changed and a classification of educational levels based on qualifications (ISCED-A) was introduced for the first time. Moreover, the last update was finalized in 2013 and it is regarded as (ISCED-F) of Fields of Education and Training.

- ISCED5-Short Tertiary Education,
- ISCED 6 - Bachelor or equivalent,

- ISCED 7 - Master or equivalent,
- ISCED 8 - Doctorate or equivalent.

They were gradually implemented in all participating countries regarding the new form of categories and the inclusion of individual levels. However, the data obtained in a new form were only publicly available in 2014. Until then, the captured data of the methodology had still been published in the basic form of the ISCED 97 methodology.

Table 1 Tertiary education in ISCED levels



Source: ResearchGate, 2018

4. Comparison of German and Czech higher education

4.1 Historical development of education in Germany

First university appeared in 14th century in current Germany. It was established in 1386 in Heidelberg followed by a university in Koln (1388) and in Erfurt (1392)[1]. Beginning of 19th century is regarded as an undoubtably important period of German tertiary sector called times of Wilhelm Humboldt (Oxford University Press, 2017). The government continued to be financially responsible for universities, but they gained inner autonomy and two basic principles: freedom for education and cooperation of studying and research.

Provincial and local management of education were reversed, and the control of education was centralized during Nazism. Consequently, universities lost their independence. After the war all principles were reenacted, and the tertiary sector was reestablished in Germany in 1953 because of the introduction of new reforms in every German state. New shops for students and new vocational techniques were developed in 60s due to the increase in the number of students. With this intention, they eliminated social and regional inequalities.

Expansion of tertiary sector caused a steep increase in financial expanses of a single German state. As a result of that development, a law was changed in 1969 (BPB, 2004). Establishment of universities became a common interest for the government and *Länder*. Above all, a Land obtained a bigger authority in the case of tertiary sector. A new reform was introduced (Hochschulrahmengesetzes) in December 1970 *(Brian Holmes*, 1971) by the Council of Education which was founded in 1957.

Hochschulrahmengesetz was first law that was valid for all *Länder*. Subsequently, the demand for studying at German universities was increasing. A number of students increased from 510000 in 1970 to 17000000 in 2005 in west Germany. A number of students increased from 133000 in 1990 to more than 285000 in 2005 in east Germany.

[1] *Economics in Germany* [online]. HET [cit. 2017-09-25]. Available at: http://www.hetwebsite.net/het/schools/germanuniv.htm

Bountiful universities were not able to sustain such a number of students. Thus Fachhochschulen were established as an independent type of university in 1970.

The establishment of Berufsakademien continued in 1974. They were oriented for a future profession. Consequently, it contributed to another different offer of education in the tertiary sector. Other new types of universities were established such as Gesamthochschulen, Fernuniversitäten and Hochschulen der Bundeswehr. New universities were established in several more important cities, including Konstanz (1966), Passau (1978), Bielefeld (1969) *(*Tertiary education, 2009*).*

Exzellenzinitiative was approved to support science and research at German universities in 2005. The aim was to support research on the top level and to increase significance of a tertiary and scientific area for the purpose of continuing improvement of international competitiveness in tertiary and scientific areas.

Föderalismusreform, which was the largest change of constitution in German history, entered into the force in 2006. It mainly modified relations between the government and *Länder.* Consequently*,* it changed a sector of education. Since then education policy was an issue of a Land. Universities were not regulated by the government and they had more autonomy. Consequently, the establishment of universities was not financially supported by the government. Even more, the students had to pay studying fees at several universities from 2006 to 2014 *(Föderalismusreform,2009)*.

A development of tertiary sector in NDR was based on communistic rules and it fully followed communistic ideology. The number of universities did not increase. Their goal was to offer more opportunities for children of the labor force and distance studies were accessible for working people.

There were a myriad of changes owing to reforms in tertiary sector after 1989. New established *Länder* were responsibile for a tertiary sector. They reestablished their autonomy and freedom of science. Above all, they opened the universities for general public.

For the frame of new reforms, a great number of universities were closed or united.

New faculties of law, economics and social science were established. Fachhochschulen were founded as a new type of university.

4.1.1 Education System in Germany

Germany has a K- 12 system and the Länder are responsible for the education system. The national conference of state education ministers (Kultusministerkonference, KMK) unites educational practices at the national level. Despite that, the Länder differ from each other as a result of the government´s insignificant role in the education system.

Germany has a rather complicated system of primary and secondary schools with 5 different types of secondary schools. The students have 5 diverse possibilities for reaching the higher academic education, technical training or a trade. Germans are convinced that public education is an important factor for contributing into the educated citizenry. So that the education is obligatory from the age of 6 to the age of 15. The whole educational system is a 3- class system that separate students into three groups:

-*Gymnasium* is determined for clever students whose aim is to study at university

-*Realschule* is for children who are good for average or better white- collar jobs

-*Hauptschule* is for children who aim at trade or blue- collar jobs

Every child is obligatorily recommended one of these class systems by the age of 10. However, it has become easier to change them. For reforming the 3- class system several attempts have not been successful so far.

4.1.2 German Higher Education System

The *Länder* are responsible for education and culture. They have cultural sovereignty (Kulturhoheit) in Germany. However, the German Federal Constitution(*Grundgesetz*) guarantees equal opportunities and living conditions at the national level. For the purpose of the employment-related and private mobility, a significant degree of the cooperation is required among the *Länder* (Kehm, 1999). Public HE institutions are supervised by

the respective ministry of the *Land*, which is responsible for HE education. Every *Land* has its own HE regulations. However, HE institutions have bountiful freedom for their academic affairs. It involves research and teaching (Kehm, 1999). It is a combination of political guidance and self- regulation (Kaulisch and Huisman, 2007). As a matter of fact the *Länder* decide on issues concerning "the organizational allocation of posts, the appointment of professors, the establishment or elimination of departments, and the internal decision-making procedures" (Kaulisch & Huisman, 2007, p. 48). Whereas the academics (professors) decide on one of the best academic issues. HE institutions are governed by a rector/president or a rectorate/presidium (Blümel, 2013).

Every Land is regulated on its own, but HE is necessary to be coordinated and cooperated. KMK is a political body to make sure that cooperation and coordination exists among the Länder. KMK was established in 1948 and it is funded by the Länder. It is "the assembly of the Ministers of Education, Cultural Affairs and Science. In the *KMK*, the ministers (in the "city-states" Berlin, Hamburg and Bremen called senators) decide on common positions on various aspects of education, cultural issues and science. The agenda of the *KMK* addresses "(…) educational, higher education, research and cultural policy issues of supra-regional significance with the aim of forming a joint view and intention of providing representation for common objectives" (KMK, 2016). Decisions made by the KMK are not law- binding for the Länder because decisions must be first transferred into the state law.

Beside the *KMK* as the joint institution of the *Länder*, there exists the Joint Science Conference (GWK). The *Länder* and the Federal Ministry of Education and Research (BMBF) deal "with questions of research funding, science and research policy strategies and the science system. They jointly affect the Federal Government and the *Länder*" (GWK, 2016).

BMBF does not directly influence policies of education. Competences of government are limited, and everything is on a basis of licensing of lawyers. However, BMBF´s influence has increased remarkably over last few years due to funding programs

including the Excelence initiative.

Hochschulrektorenkonferenz (HRK) organizes diverse HE institutions. It is a voluntary organization in Germany and it can be considered as a political and public voice of HE institutions (HRK). HE institutions are divided into three different types of institutions, namely universities, universities of applied science (Fachhochschulen) and colleges of art/music. HE institutions are either private or public. Private HE institutions are mainly run by churches, foundations or companies. Universities of applied science are mostly private universities recognized by the Land (HRK).

4.1.2.1 Universities

Universities are more research-oriented and have the right to award doctoral degrees. They provide bountiful different studies, although a great number of them are specialized in specific research fields, for instance medicine or technology.

There are copious traditional universities in Germany, which mainly concentrate on basic research. The technical universities (Technische Hochschulen) are several of them, whose main focus is on natural and technical sciences. Hence, they become more theoretically focused in later stages of the study and they are more concentrated on the research.

4.1.2.2 Public universities

Public universities are mainly public corporations. However, at the same time they are state institutions of *Länder*, which follow their own rules. With this intention, their activities are watched by the ministry for education and by the senator of science and art.

Up to 97 percent of all students attend public universities, which are monitored and governed by *Länder*. What is more, federal states fund public universities in Germany. Studies are offered to everybody who has a graduation certificate. As a matter of fact, it

is an authorisation for studying at university. Studying at university have been for free since 2014. Nevertheless, non- EU students have had to be paying for studies since 2017[2].

A semester fee (Semesterbeitrag) must be paid by all enrolled students. It consists of an administrative fee for the university, which is only charged in several *Länder*. Students must pay for Studentenwerk, which is for a statutory student affairs organization. Furthermore, they also pay a fee for the university's Allgemeiner Studentenausschuss and Studentenschaft. Public transportation must be paid at manifold universities as well. Moreover, more fees have to be paid depending on the university's students' parliament. Overall, they pay between €85 and €295 per semester[3].

University-sponsored scholarships do not exist in Germany. Even though, there are a great number of private and public institutions, which provide grants. They are projected into covering the living costs and books. Another option is Bafög, which is a study loan program funded by the government.

4.1.2.3 Private universities

A private university is defined as a university in private ownership, which is certified to provide academic degrees. First private university was established in Witten in 1982. Fachhochschulen and Kunsthochschulen can be private as well. Universities that are in ownership of church are called christen universities. Admittedly, every university must be approved by the government. Besides, the legal framework is ascribed in Hochschulrahmengesetz HRG §70 and university laws of states. Nonstate universities are certified by Wissenschaftsrat.

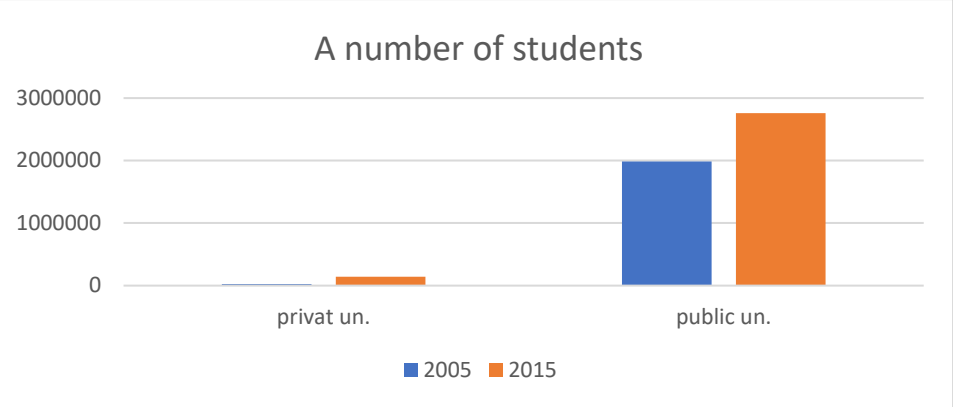
Considerable tuition fees must be paid by students for attending a private college. Students pay 20000 Euro a year for studying at a German private university. However,

[2] *German universities introduce tuition for non-EU students: R.Pells* [online]. Independent, 2016 [cit. 2017-09-19]. Available at: http://www.independent.co.uk/student/study-abroad/german-universities-reintroduce-tuition-fees-international-non-eu-students-erasmus-baden-wurttemberg-a7453666.html

[3] Studiengebühren in Deutschland und der Welt: Studienfinanzierung. *Mystipendium* [online]. Available at: [cit. 2017-09-19]. http://www.mystipendium.de/studienfinanzierung/studiengebuehren

the popularity of private universities was increasing. (Cheap, Private Universities in Germany, 2018).

Figure 2 Privat and public university



Source: DeStatis, 2018 own work

95% of all universities in Germany are regarded as public. The attendance of public universities is free of charge. However, private universities were increasing in popularity due to smaller sizes of classes. What is more, they were more globally oriented. 140,000 students[4] were excepted in private universities in Germany in 2015[5]. In comparison with a year 2005, the interest in studying at private university increased 10 times over 10 years, which is illustrated in Figure 2.

4.1.2.4 Universities of applied science and colleges of art/music

Universities of applied science (Fachhochschulen) and colleges of art/music art are universities that are concentrated on architecture, visual communication, acting or film. They are officially recognized by the state (HRK). These universities offer natural, social,

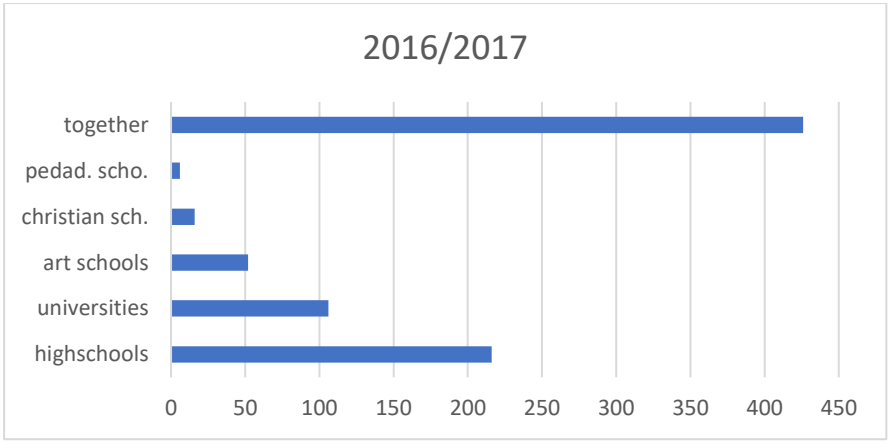
[4] *Very high quality at all universities* [online]. Land of ideas [cit. 2017-09-23]. https://www.study-in.de/en/plan-your-studies/types-of-universities_26607.php

[5] Hochschulkompass: Der stimme der hochschulen [online]. HRK[cit.2016-10-28] <http://www.hochschulkompass.de/kompass/xml/download/hs_liste.txt>

economic, technical and artistic subjects. It is the reason why these schools are called as universities of applied sciences (Hochschulen für angewandte Wissenschaften) in Germany. They differ from traditional universities from the way how they are practically oriented. Not only the students must do one semester of practices but the teachers at these universities have required working experience.

Studies are organised either in a small group or individually. They include practically focused studying branches and also theoretically scientific subjects. They involve subjects of history of art, musical science, history of music and art of sciences. Overall, all subjects connected with art are taught at the university of art[6].

Figure 3 A number of higher education facilities in Germany

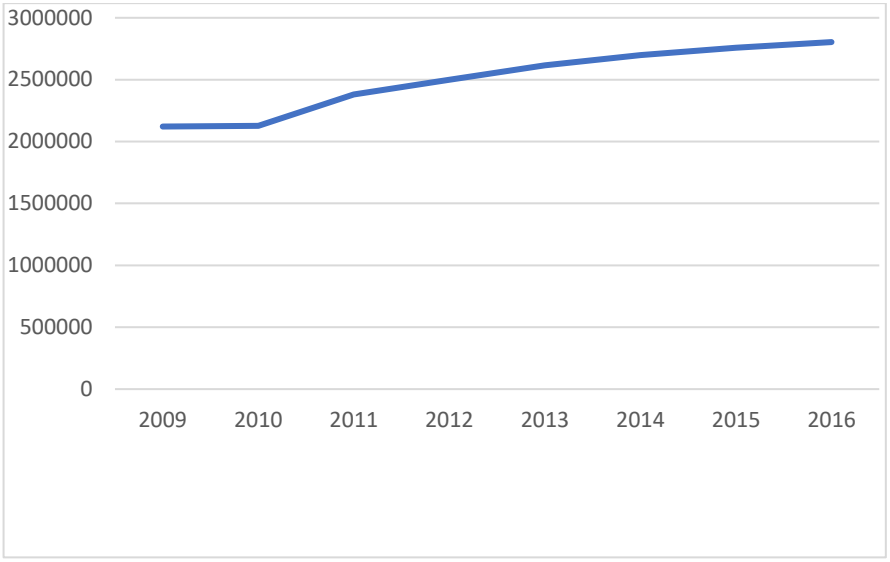


Source: DeStatista, 2018 own work

There were 428 institutions of higher education in 2017 in Germany. The number of institutions consisted of 106 universities, 217 high schools, 53 art schools and 16 Christian schools as it is demonstrated in Figure 3.

[6] *Very high quality at all university, ref4, page24*

Figure 4 A number of students at German universities 2009- 2016

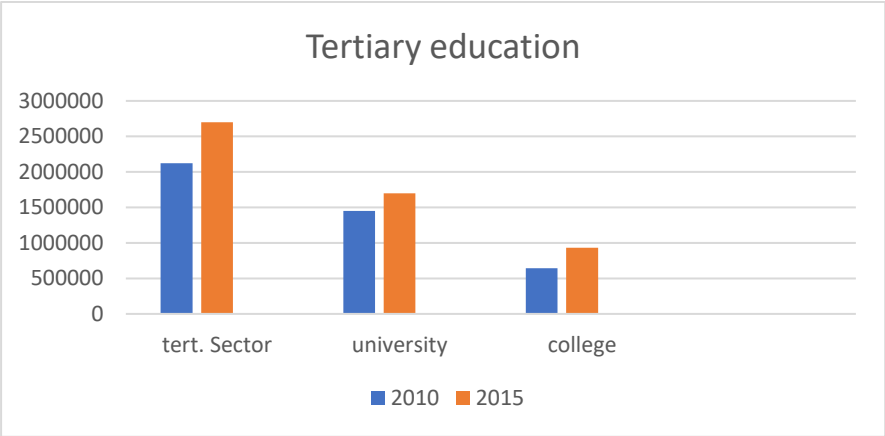


Sources: DeStatista, 2018 own work

A number of students at the university was steadily increasing over 8 years. Less than 2000000 students were studying at the university from 2009 to 2016. The predictions from the past that there would be studying more than 2500000 students at the German university in 2016 did come true as it is illustrated in Figure 4. There were 240 state universities and 100 private universities in Germany in 2016. Science, research, education and providing degrees are the main purpose of universities. Universities were divided into faculties that connected related scientific branches. Studying at the university was governed by a Land. They received money from its budget[7].

[7] *Current area: Prepare your studies: Studying in Germany* [online]. Deutsches Studentenwerk, 2017 [cit. 2017-09-25]. Available at: http://www.internationale-studierende.de/en/prepare_your_studies/studying_in_germany/

Figure 5 A number of students



Sources:1. DE Statista, 2018

2.Federal Ministry of Education and Research, 2018

3. datenportal, 2018

A development of a number of students at tertiary education was increasing between 2010 and 2015. There studied 1985765 students at tertiary sector in 2005. At that time less than 1.5 million of students studied at the university and more than 560000 students studied at the college. Besides, the number of students considerably increased in 2015. A number of students increased by 800000 up to 2757799. Hence 1.7 mil. students studied at the university and 965811 students studied at the college as it is demonstrated in Figure 5.

Yet the number of students changed somewhat between 2015 and 2018. There studied 1754802 students at the university and 978826 students at the university of applied science in 2018 (Statista, 2018).

4.1.3 Financing of higher education

The higher education is not financed manifold from several reasons, such as how education is considered from a political point of view, budget limitations, the question of translation or how universities are operated. Consequently, it is financed from public and private resources.

There must be several issues that have an impact on the factors that are mentioned. Hence, these factors make diverse economic theories about it. Financing and impacts that influence the education is explained by bountifold scientists. According to Joseph E. Stiglitz (STIGLITZ, 1997), there is a large inconsistency between economic theories regarding the financing of education. These theories divide economists into two groups.

The first group reports that it is advantageous to study at th euniversity to improve opportunities on the market. They suppose that it brings profit in the end. However, according to the other group, investment relates to costs as well. As a result, it generates what is not only for the individual but for the whole society too. Above all, improvement of knowledge is associated with it. It helps innovate and obtains better understanding of culture. Consequently, other non-economic sectors are bettered by more prolific economy and improvements.

4.1.3.1 Financing of the tertiary sector in Germany

(A process of financing of the tertiary sector)

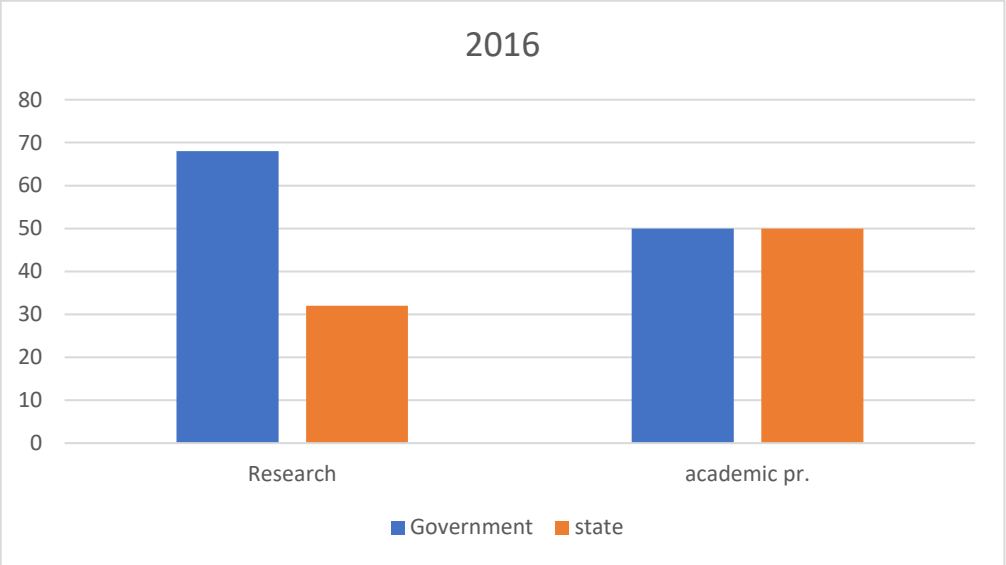
Copious changes have occured as for the financing of the higher education in Germany since 1990s. Consequently, it was influenced by the inflation and by the growing number of students. The government was financing the higher education more and the role of the *Länder* was diminishing. In addition to it, universities were able to be funded from different resources. However, the highest proportion of costs was financed by public funding. Nevertheless, the introduction of fees failed. The basic funding was reduced. The public funding started occurring on a monthly contracts basis and incentive-financing was increasing. Whatever the case, the research and the excellent universities became veritably important. As for the trendy public financing, the dangers and positives were related to it. As a result of it, it was controversial.

Even more, the Government stressed the importance of the higher education, research and high technology. Hence, they developed several methods how to promote it. The Initiative and the Strategy were two of them. The Strategy followed the Initiative. The Government and the *Länder* participated on financing of programs for Research and

Education. The government took the more sizable part in the research projects than the educational financing though. The educational financing was executed equally by the *Länder* and the government in 2016.

Almost one third of spending on research and development in Germany was provided by federal and state governments. The Government was thus the main sponsor of research in Germany alongside its industry as it is illustrated in Figure 6.

Figure 6 Funding cooperation between government and state in %



Source: Federal Ministry of Education and Research, 2018 own work

The Länder were responsible for funding about 240 of public higher institutions, which had the absolute autonomy in cultural and educational issues that are set in the law. Not only the government and the Länder worked together for supporting scientific, educational and research projects but they funded supranational projects together as well. (*Government Funding, 2016)*.

Table 2: Financing of the tertiary sector in Germany.

	2008	2009	2010	2012	2013	2014	2015
Budget in bil Euro	153,9	164,6	172,3	181,4	186,5	192,1	195,1
Share of GPP in %	4,4	4,9	4,9	4,9	4,9	4,9	

Source:datenportal, 2018 own work

In Germany, 192.1 billion Euro was spent on tertiary sector in 2014. What is more, the expenditure on education increased up to 200 billion in 2017[8]. The share of GDP was 4,9 in 2014 as it is illustrated in table 2.

The Budget of the Federal Ministry of Education and Research for 2017

The budget of the Federal Ministry of Education and Research continued to rise. Above all, it demonstrated what high priority Education and Research had. The German Parliament and the Bundestag adopted the Federal Government's 2017 budget by increasing the financial resources. It became available from 1,2 billion Euros to about 17,6 billion Euros for the Federal Ministry of Education and Research. As a matter of fact, it increased by 7.6 percent compared to the one year before to further strengthen education and research *(*bmbf.de*,* 2017*)*.

[8] *The Budget of the Federal Ministry of Education and Research: Ministry* [online]. bmbf.de [cit. 2017-09-21].

4.1.3.2 Funding Programs

- **Individual Grants Programs**

Researchers who completed their academic training were eligible to submit project proposals with a defined thematic focus and project duration.

- „**Exzellenz**“for support of top science (6,5 million of Euro every year)

The Excellence Initiative aimed to promote a top-level research. They were determined to improve the quality of German universities and research institutions in order to make Germany a more attractive research location. In addition, to make it more internationally competitive. In this respect, they focused the attention on the one of the

best achievements of German universities and the German scientific community. After the Excellence Initiative was passed by the German federal and state governments, the DFG was provided responsibility for running the initiative together with the German Science Council.

- **Coordinated Programs**

Coordinated programs promoted cooperation and structural innovation by encouraging national and international collaboration in areas of current relevance. The Coordinated Programs concentrated on the scientific potential at the university.

- **Research Infrastructure**

The DFG offered to build the centrally-coordinated funding. They decided to improve scientific infrastructure with: Scientific Library Services and Information Systems, Scientific Instrumentation and Information Technology and Central Research Facilities.

- **Scientific Prizes**

The DFG awarded the prizes to the scientists and academics for recognition of their

outstanding research achievements (Deutsche Forschungsgemeinschaft, 2014).

- **International Programs**

Second Exzellenzinitiative was between 2012-2017. Another 5 universities were awarded as a symbol of the elite university. Chosen universities received 2,7 billion euros (DZHW, 2016). Several universities had to cede their privileged position, for example Karlsruhe university, which had a prime research project cooperation with other universities. 11 universities were members of this elite group including 5 new members: die Humboldt-Universität Berlin, Bremen, die TU Dresden, Köln und Tübigen. Universities received 2 billion Euros by 2007 for research. 75 percent were paid by the

government and 25 percent were paid by *Länder*. There were recommendations about how to maintain research at the top level. For this purpose, they were determined to execute Exzellenzinitiative for the third time at last.

4.1.3.4 Bafög (a law supporting education in Germany)

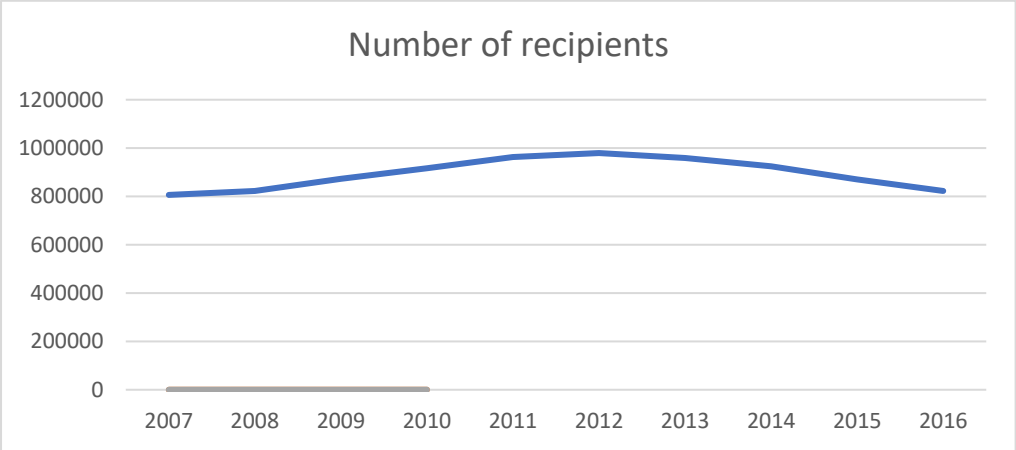
Bafög was established on the 26th of august 1971. The government declared a support for education of the pupils and students. The main aim was to increase equal opportunities for people and enable financially poor inhabitants to receive education. Besides, 67 percent of students did a part- time job to be able to cover their studies and other expenses. (Bundesministerium fur Billdung und Forschung,2016)

Amount of financial support depended on the own salary, property of the student and income of their parents. What is more, they were financially supported during their whole studies. As a matter of fact, they received half of the support as an unreturnable contribution and the other part as an interest- free- credit. Debt was partially condoned to brilliant students. Redeeming of the debt depended on how large they had a salary. It was redeemed four times a year. Above all, it was possible to stop redeeming the debt when they did not have a sufficient income.

A volume of Bafög as an expense from the government was increasing from 2000 (1300000 Euros) to 2012 (3277975 Euros). Nevertheless, a number of recipients was

degreasing from 2012. It degreased during 5 years by 100000 recipients. It dropped further to 823000 recipients in 2016 (DeStatis, 2017) as it is demonstrated in Figure 7 below.

Figure 7 Number of BAföG recipients



Source:datenportal, 2018 own work

Table 3: BAföG (a law supporting education in Germany) in Euro

	2007	2008	2009	2010	2011	2012	2013	2014	2015
recipient	806085	822323	873082	916295	962834	979347	958743	924770	870455
fin. expense	2188055	2331918	2702569	2873055	3180046	3277975	3240623	3142077	2971636

Source: .datenportal,2018 own work

4.1.3.5 Development of Tuition fees

Students had to start paying fees for studying at the university in several *Länder* in Germany in 2005. The Germany's constitutional court did not approve a ban on tuition fees. They argued that it limited the powers of regional governments. Nevertheless,

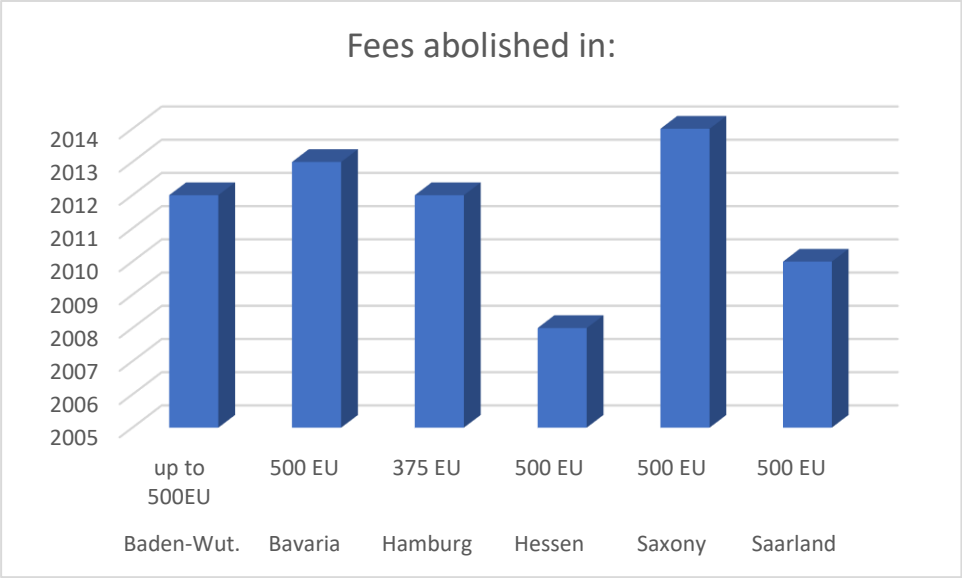
several universities started charging €1,000 a year. They awaited a more dynamic internal market. Consequently, there were intensive discussions about paying fees for studying at the university. There was a myriad of protests by students. Besides, public was involved, as well (The Observer, 2016).

There was a great number of universities where studying fees had to be paid in 2013. Students in Bavaria had to pay 500 Euros per semester in 2013. However, studying fees were cancelled from a year 2014, which is demonstrated in figure 8[9]. Students had to pay 50 Euro per semester in Bremen. Even so, they had to pay 500 Euro from 15th semester. Students in Niedersachsen had to pay 500 Euro when they exceeded 6th semester of their studies. When they exceeded 7th semester of their studies, they had to pay 700 Euro. When they exceeded 9th semester of their studies, they had to pay 800 Euro. Those fees were reduced from 600 Euro to 400 of Euro for students in Saarland when they exceeded 4th semester of their studies. Students in Sachsen paid 500 Euro when they exceeded 4th semester of their studies. Students in Sachsen-Anhalt paid 500 Euro when they exceeded 4th semester of their studies. Students in Thüringen paid 500 Euro when they exceeded 4th semester of their studies (Einschtieg, 2014). Hence, since 2014, all students no matter of where they were from did not have to pay at the German university.

However, the fees were reintroduced for non- EU students in Baden- Wurttemberg in autumn 2017. Students from non-EU countries had to start paying between €3,000 (£3,660) per year. Nevertheless, it was reduced to €1,300 (£1,600) for students who were attempting for a second degree.

[9] *Did Tuition Fees in Germany Constrain Students' Budgets? New Evidence from a Natural Experiment* [online]. Bonn: IZA, 2014 [cit. 2017-09-25]. Available at: http://ftp.iza.org/dp8623.pdf

Figure 8 Overview of Tuition Fees in Germany



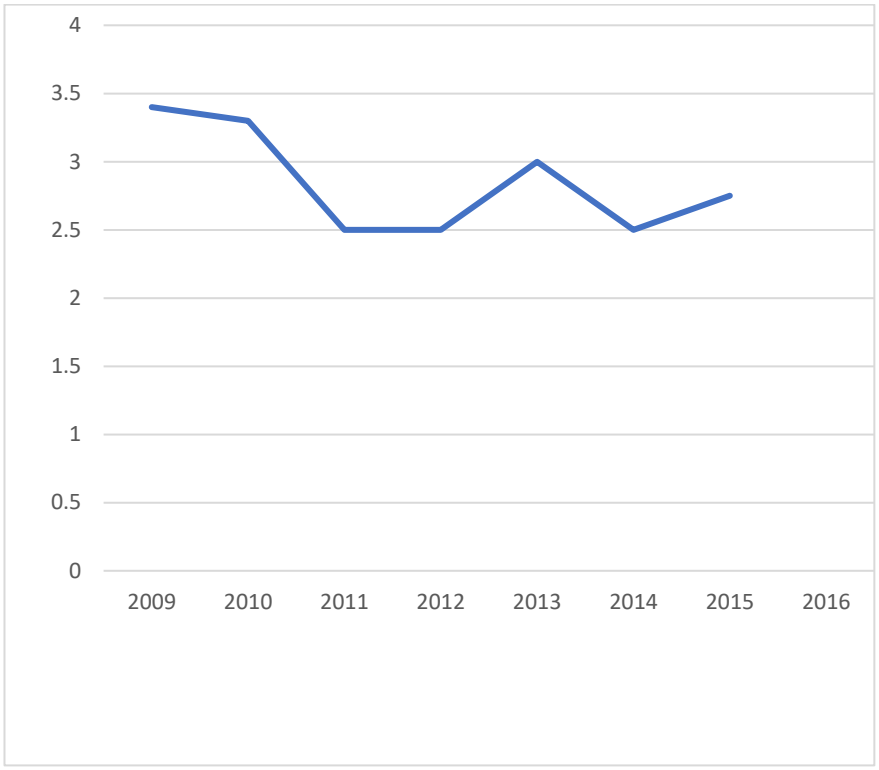
Sources: Iza, 2018 own word

In Lower - Saxony and North Rhine -Westphalia the first-year students had to pay tuition fees from the winter term 2006/2007. Consequently, older students had to pay from the summer term 2007. No tuition fees were charged in Berlin, Brandenburg, and Bremen.

Even so, the students had to pay in several *Länder* during the winter term 2006/2007 illustrated in Figure 8. As for the students who did not have their main residence in Germany. Furthermore, it also included students who overreached 15th semester in their studies. The same payment was executed in the same way in Mecklenburg-Western Pomerania, Rhineland-Palatinate, Saxony-Anhalt, Schleswig-Holstein and Thuringia.

4.1.4 Unemployment rate 2009- 2016

Figure 9 Unemployment rate of graduates in % 2009- 2016



Source: bpb, 2018 own work

The unemployment rate of university graduates fell from 2009 to 2,5 % in 2011. It increased in 3 % in 2013 illustrated in Figure 9. Whatever the case, the data for the rate of unemployment for 2014 and 2015 were not available. Hence, it was elaborated as an average of previous years. Overall, the rate was not significantly high at that time. It was again at 2,5 % in 2016.

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4.2 Historical development of education in the Czech Republic

The first schools are reported from the old Slavic settlements from the times of the Great Moravia, in the course of Christianization of the population by Constantin and Methodius. The first school was founded in Budec. Children of the nobility were educated in religious studies. Writing and reading were in Latin (Somr,1987). St. Vitus´s church school was founded in 973 in Prague and it became one of the most distinctive schools. Besides, Benedictine monasteries mainly established schools at the end of 10th century.

A new type of schools was founded in the middle age. They were created by towns. As a matter of fact, they were flourishing due to the quick development of trade and craft. The schools were not different from those, which had been founded by monasteries. The children of rich parents were taught by priests. The same type of schools was established in all towns in Bohemian kingdom in the 12th and 13th centuries.

As a result of the end of the crusades in the 12th and 13th centuries new universities were established. They did not depend on the church and rulers. Above all, they were international from the beginning. The students were able to change the university without further consequences. The studying was done in Latin.

Charles university was established in 1348 by Charles IV. The church had the existential worries in the 14th century. German teachers left the university for Leipzig and Jan Hus was announced as the rector of the university. He was burned to the death in 1415 because of his proreform activities for reforming the church. Poor people had a possibility to study at the Charles university in the 14th and 16th century. Furthermore, the second university was founded in Olomouc in 1576 to counter weight of the influence of Protestants. Subsequently, they controlled the Charles University. The Czech education was influenced by Jesuits and they gained their own university in 1622.

Johann Amos Comenius is regarded as one of the most considerable personalities of the Czech education. He lived in the 17th century. He made the first education system. The obligatory education was established by law in 1774. As a matter of fact, it was established for 6 years. Consequently, it was prolonged up to 8 years in 1869.

The Czech history was for a large part of its history connected with the Austrian-Hungarian Empire. Hence, the education system of the Czech lands was similar to the Austrian- Hungarian Empire. The 20s and 30s of the 20-century meant a fast development of education. There were attempts to reform it. Czechoslovakia belonged to one of the top ten most developed countries in Europe with a strong network of universities and schools. Consequently, several new universities were established, for example University of Masaryk in Brno.

The Czech education was in a poor condition during the Nazism. The universities were closed, and German was obligatorily taught at schools. New schools were founded to teach Nazi ideology. The education system was not in a prime condition after the end of the war. There were few teachers and there was a necessity to build new universities. Nevertheless, the studies at the university started to be provided in 1945.

All schools became state- centered and the church lost its influence in 1948. After the Velvet Revolution in 1989, basic principles changed from communism to democracy-based. The school system was unified, compulsory and nature science work were oriented (Nedorost, Větrovec, 1998, p. 252).

4.2.1 Education System in the Czech Republic

Education is free of charge and school attendance is obligatory for children from the age of 6 to the age of 15. After pre- school education, children start attending elementary school at the age of 6- 7 and it lasts for 9 years. Most children attend state school, but it is possible to attend private or church school. Elementary school is divided into two levels: a primary and a lower secondary level. The children can attend 6 or 8- year gymnasium after 5th and 7th year of elementary education.

From the age of 10 to the age of 13 children attend upper secondary school. It is generally for 4 years. At the age of 15 children have more options for continuing in their education:

Gymnasium prepares children for university study. It lasts 4 years. It offers general or vocational education. The education is ended with a graduation, which consists of two

parts: profile and common part. Students are provided the graduation certificate after passing the graduation exam, which enables them to study at the university. (National Training Fund, o.p.s., 2006).

Special schools are specialized in branches such as building, music and art.

Vocational schools with VET certificate prepare workers for practical job. It lasts 2- 3 years of studying. The studies are finished with a VET exam. The students obtain a VET certificate after passing the exam. After the end of the studies, the student can study 2 more years to receive a graduation certificate, which entitles them to study at the university.

4.2.2 Czech Higher Education System

Higher education is available for people, who successfully graduate from secondary school. The students have two options how to continue in their studies. They can either study at university (*Univerzita*) or at Higher vocational school (*Vyšší odborná škola*). Higher vocational school is more focused on their future profession. They obtain a title called "Certified specialist (DiS.)" after finishing their studies, which are between 3 and 3,5 years.

Second option is to study at university called "vysoka skola". It is one of the highest forms of the Czech education system. It consists of 3 levels: Bachelor´s degree program (ISCED 6) lasts 3- 4 years. It ends with the final state examination. Students must defend their bachelor thesis as a part of the exam. Graduates are awarded the academic title Bachelor (BSc.). Master´s degree program (ISCED 7) lasts 2-3 years. It ends with the final state examination. Students must defend their thesis as a part of the exam. After successfully passing the exam, they are awarded the academic title Master (either Mgr. or Ing). Doctoral degree program (ISCED 8) lasts 3-4 years. It ends with the state doctoral examination and graduates commonly obtain the academic title Doctor (Ph.D).
(Czech Ministry of Education, Youth and Sport, 2012)

4.2.3 Financing of higher education

Higher education institutions obtain financial support from the government for their activities and capital costs. The amount of financial contribution depends on the number of students and graduates, the economic costs of the relevant study program and specific quality and performance indicators. It can be funded through grants. Part of the amount of money is allocated to schools based on the qualitative criteria[10]. There will be a new reform about financing of education from 1st of January 2019.

Studying at the university is for free. Nevertheless, public support does not exist for studying at the university in the Czech Republic. As a result, the students must have their own financial resources for their studies. It is impossible to finance the studies from grands either. Above all, it is not bountiful money, and it is difficult to obtain it.

However, there are some penalties for students who extend their studies. Every additional year costs 15000 CZK. Whatever the case, the parental leave is not included. The students who are attempting for a second degree pay 2700 CZK per year. However, studies in English are profoundly expensive. The price depends on the branch and the program or institution. It can be between 15000 and 400000 CZK a year.

[10] *Czech Ministry of Education, Youth and Sport: The Education System in the Czech Republic* [online]. 2nd edition. Prague: Centrum pro zjišťování výsledků ve vzdělávání (CERMAT), 2012 [cit. 2018-06-21]. ISBN ISBN: 978-80-87601-12-9. Available at: www.msmt.cz/file/27043/download/

5. Practical Part

Manifold researchers have examined a positive effect of the expenditure into the education, such as Hanushek, Wößmann (2008). GDP per capita, % share of GDP and financial expenditure are examined in the practical part. Besides, several controversial details in both countries are reported in this part.

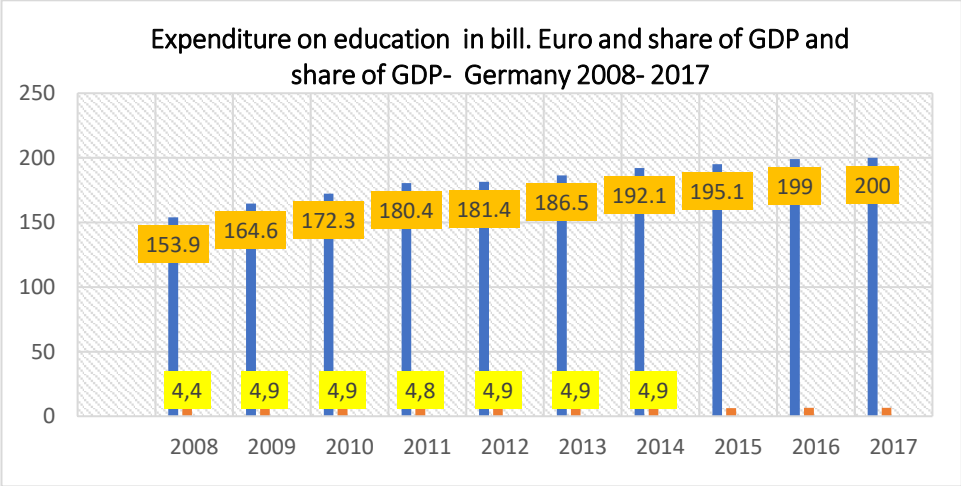
OLS method investigates the dependence of the expenditure on the youth rate of unemployment. For the purpose of the analysis, the data between 2008 and 2016 are considered.

5.1 Germany

The highest public share of GDP increased to 4,95 % in 2014. The lowest share of GDP was recorded at 4,41 % in 1993. However, share of GDP was relatively stable from 2008 to 2014. What is more, the expenditure on the education was increasing every year through 2008 – 2017. Consequently, the expenditure on education increased by 50 billion of Euro over 10 years demonstrated in Figure 10. Nevertheless, a large portion of data for a % share of GDP was not available from a year 2015 (Statista, 2018).

Because of the economic strength of the country, they are able to spend more money on public and private institutions in comparison with the Czech Republic. (Datenportal, 2017).

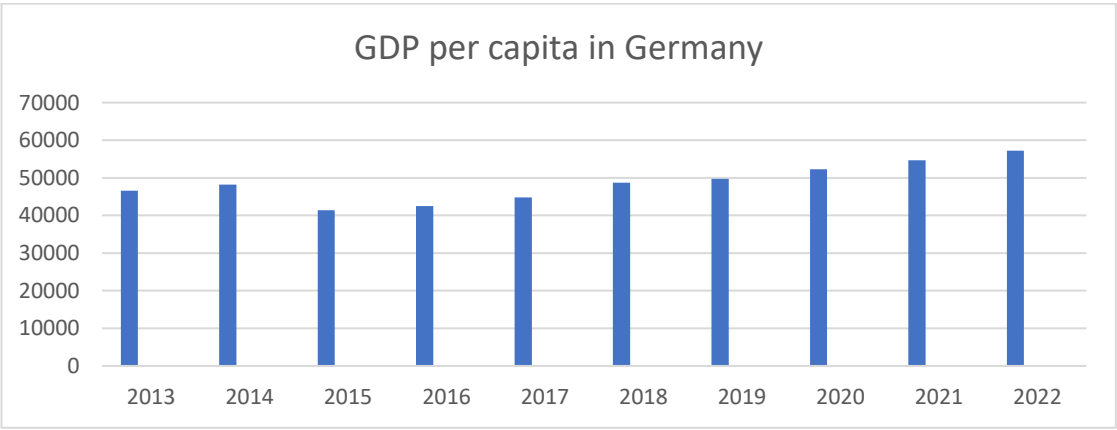
Figure 10 Expenditure on education



Source:datenportal, 2018 own work

As a matter of fact, Germany´s gross domestic product reached 44,549 U.S. dollar per capita in 2017. Consequently, it made Germany as one of the most leading countries in the world as for GDP per capita. Years 2018- 2021 are the projections. Namely, the projections predict that GDP per capita will be rising every year up to a year 2021. Above all, they predict that GDP per capita will be 58,378 U.S. dollar per capita in 2021 illustrated in Figure 11.

Figure 11 GDP per capita U.S. dollar



Source: Statista,2018 own work

Despite these prime economic results, Germany is struggling to successfully integrate refugees. In terms of the refugees, German schools have accepted 130000 new students since 2015. For the purpose of the better integration they have provided them all what is necessary for regular schooling, such as intensive courses, appropriate classes and one-on-one mentoring.

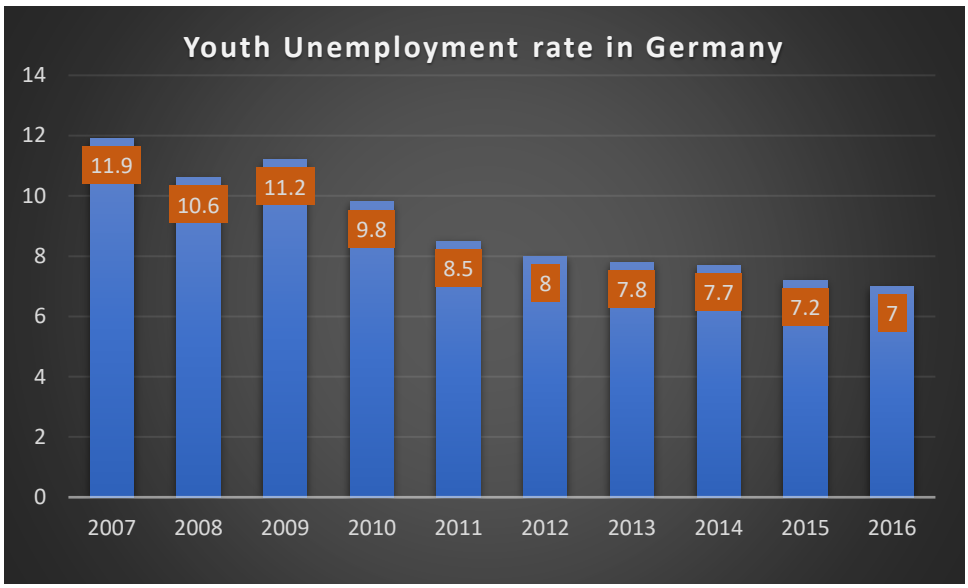
What is more, they frequently lack qualified teachers in deprived areas. Hence, teachers tend to become overburdened. Even after 2- year program, refugees need a specific assistance, such as advanced language courses. Subsequently, teachers typically have culture problems because majority of refugees grew up in a different religious context. Besides the problems with refugees, Germany is struggling with child´s poverty and income inequality[11].

5.1.1 Youth Unemployment and Expenditure in Germany

As a matter of fact, the youth German unemployment was at 7% in 2016. Consequently, it was one of the lowest youth unemployment rates in Europe. Namely, the rate of unemployment refers to people who were between the age of 15 and 24. They were not employed although they were actively looking for work. However, the unemployment rate dropped by 5 % over 10 years illustrated in Figure 12.

[11] *European Commission: Education and Training Monitor 2017 United Kingdom* [online]. Luxembourg: Publications Office of the European Union, 2017 [cit. 2018-06-18]. ISBN 978-92-79-70061-3. Available at: https://ec.europa.eu/education/sites/education/files/monitor2017-uk_en.pdf

Figure 12 Youth unemployment rate in %



Source: statista, 2018 own work

Data was taken from statista.de and bmbf.de. With this intention, all possibilities were analyzed to obtain the ideal model for detecting the strongest links. Analysis have been performed by using Ordinary Least Square method from the period 2008-2016.

Data set (observation 2009- 2016)

	y	x
2008	10,6	153,9
2009	11,2	164,6
2010	9,8	172,3
2011	8,5	180,4
2012	8	181,4
2013	7,8	186,5
2014	7,7	192,1
2015	7,2	195,1
2016	7	200

Resources: bpb, 2018

y= youth unemployment rate in %

x=expenditure in bill. Euro

In the model, R^2= 0,881545= 88%. It reports that dependent variable (unemployment rate) is influenced from 88%. Consequently, the variation in unemployment can be explained from 88%. In addition to it, p- value is 0.0002. Hence, the result is statistically significant.

The equation is:

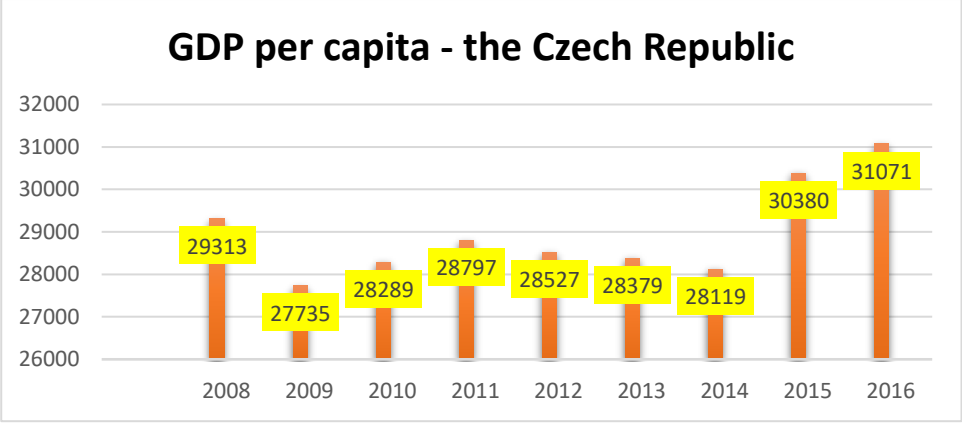
Y_{1t} =2026,61 – 1,69x + u_t

It reports that 1% increase in expenditure on education decreases the youth unemployment rate by 1,69 %.

5.2 The Czech Republic

As a matter of fact, the GDP per capita was last recorded in 2016. However, it amounted to one of the highest points of its history at 31071 U.S. dollar in 2016. Even at its critical point it was somewhat lower in comparison with Germany´s GDP per capita though. GDP per capita recorded one of the lowest points in 1993 at 17573 U.S. dollar. However, GDP per capita was not profoundly stable between 2008 and 2016 as it is illustrated in Figure 13. While it decreased to 27735 in 2009 because of the world crises it was steadily increasing between 2010 and 2011. It was decreasing until a year 2014 and then it steeply increased in 2015. Overall, it continued to rise in 2016 as well.

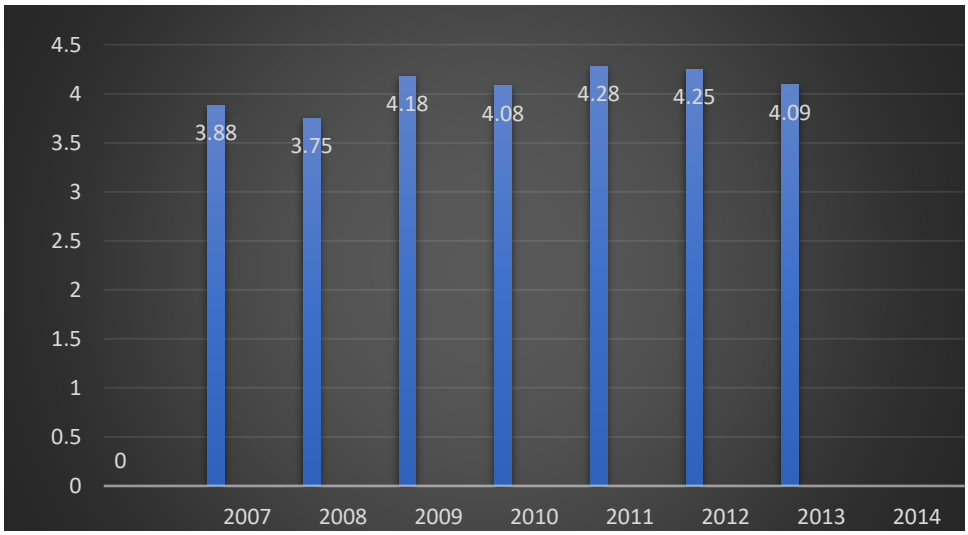
Figure 13 GDP per capita in U.S. dollar



Source: tradingeconomics,2018 own work

In terms of share of GDP on the education in the Czech Republic, it was somewhat lower in comparison with Germany. On one hand, it reached one of the highest points in 1994 at 4.71. On the other hand, one of the lowest points was reached in 1998 at 3.61. Nevertheless, the spending on education was increasing between 2007 and 2014 as it is illustrated in Figure 14. The last time when the share of GDP was recorded, it was at 3,99% in 2014 though.

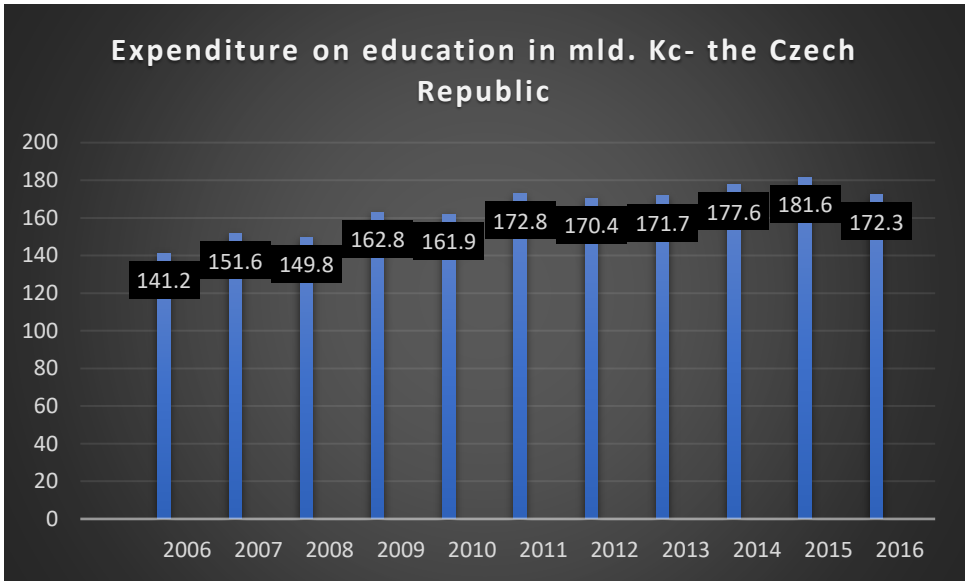
Figure 14 Share of GDP in % on Education



Source: htindexmundi, 2018 own work

While financing of education was increasing from 2006 to 2015, it dropped somewhat in 2016. Subsequently, the budget was recorded at 172,3 billion CZK for a year 2016 as it is illustrated in Figure 15. However, the Czech expenditure on education was profoundly lower than a German expenditure on education. Subsequently, the German expenditure was recorded at 200 billion Euro in 2017 as it is demonstrated in figure 10.

Figure 15 Expenditure on education



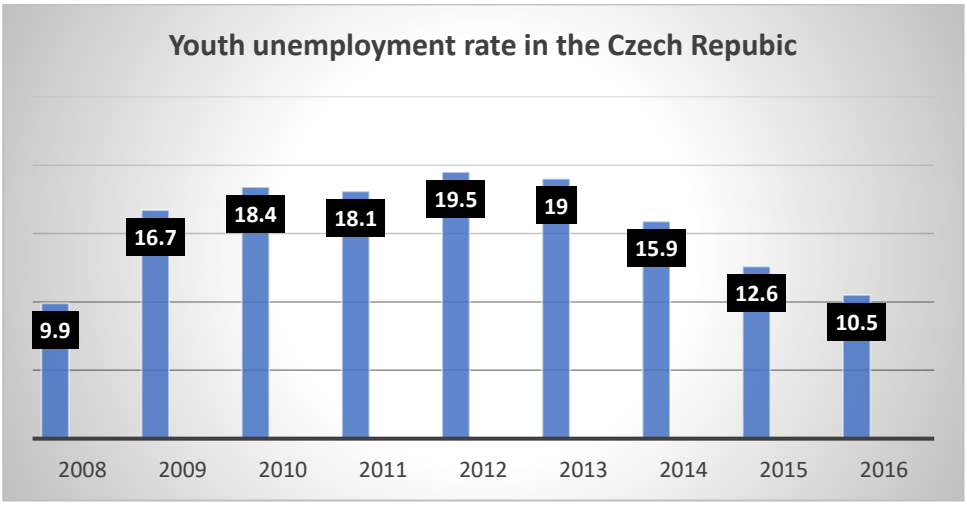
Source: MSMT, 2018 own work

According to OECD´s Education at a Glance, Czech education is not funded sufficiently. Subsequently, the Czech teachers are not paid bountiful. There is somewhat negative attitude towards Roma minority. Due to their wild temperament, they are frequently placed into the special class for children who are somewhat behind other children in their studies. The Czech education system is reported to be one of the best in the EU. As a matter of fact, it is for free including studying at university. Subsequently, children obtain very good writing, reading and arithmetic skills and a general overview of all subjects.

5.2.1 Youth Unemployment and Education Expenditure in the Czech Republic

Youth unemployment started decreasing from 2013. Above all, it was at 9 % in 2017. Subsequently, it was the last time when the youth unemployment was recorded. While the unemployment rate was rising from 2008 to 2012, the 19,5 % youth unemployment rate reached one of its highest points in 2012, though. However, it decreased by 9 % over 4 years illustrated in Figure 15. Overall, the youth unemployment rate in the Czech Republic is somewhat higher than in Germany.

Figure 16 Youth unemployment rate in %



Source: statista, 2018 own work

Data set (observation 2008- 2016)

	y	x
2008	9,9	149,8
2009	16,7	162,8
2010	18,4	161,9
2011	18,1	172,8
2012	19,5	170,4
2013	19	171,7
2014	15,9	177,6
2015	12,6	181,6
2016	10,5	172,3

In the model, R^2= 0,29= 29%. It reports that the dependent variable (unemployment rate) is influenced from 29%. Whatever the case, the variation of the unemployment can be only explained from 29%. In addition, p- value is 0.6570. The result is thus statistically insignificant. The model of the econometric test is in the appendix.

Nevertheless, the outcome of OLS models was partially successful. The theory that unemployment rate can be influenced by providing expenditure into education was confirmed in the case of Germany. Furthermore, the dependence of unemployment rate on expenditure into education was not statistically significant for the Czech Republic.

Y_{1t} =2013,99 – 0,12 + u_t

6 Summary

The Czech Republic as well as Germany have a different education system. However, due to the ISCED classification it is possible to compare both education systems. A German education system is more complex. On ISCED 2 there are 5 types of schools, on ISCED 3 there are 4 types of schools and on ISCED 6 and 7 there are 5 types of schools. What is more, German child´s future is decided at their early age. Subsequently, they are recommended the education track at the age of 10 depending on their results at school and their teacher´s opinion. Nevertheless, they can change the track later in their lives now. Whereas, the Czech education system is not critically complicated, and 3 tracking education system does not exist in the Czech Republic.

Nevertheless, both countries are dealing with specific worries. Germany is trying to integrate a sizable number of immigrants who are culturally different. What is more, they do not know their language. Hence, the teachers are frequently overburden with work and cultural difficulties in the class. Yet, the Czech Republic has been trying to integrate a Roma community into their society for a very long period of time with controversial results.

Germany was spending more on education from 2008 and they spent 200 billion Euro on education in 2017. Above all, the share of GDP and GDP per capita were higher in Germany. Whereas, the Czech Republic were spending less on education than Germany. They spent 172,5 billion CZK on education in 2016. The Czech Republic was growing economically somewhat more than Germany due to the fact that it was still less economically developed. In terms of the youth unemployment, it was somewhat lower in Germany than in the Czech Republic during the observed time.

OLS models have served for examining whether there has been the dependency of the unemployment rate on the expenditure. However, the dependency was only confirmed for Germany. Observation data were between 2008 and 2016.

7 Conclusion

Being educated is essentially important not only for a single person but it helps countries enhance their economic development[12].

Besides, the aim of this diploma thesis was to compare the Czech and German education system and to investigate whether there is the dependency of unemployment rate on the financial expenditure on the education. In terms of the German education system, it is more complex. Above all, Germany spent more money on education than the Czech Republic.

Regarding the main research question, which was to investigate what the effect of the expenditure on education has on the youth unemployment rate, the result of OLS models was only partially successful though. The theory that unemployment rate depends on the expenditure into education was confirmed from 88% in the case of Germany. As a matter of fact, it reports that the financial expenditure has a positive impact on the rate of the unemployment for the reason that it decreases it. Due to the fact that the diploma thesis worked with a limited number of observations, the dependence of unemployment rate on the expenditure into education was not statistically significant for the Czech Republic. At any rate, not only the education makes people healthier but it profoundly decreases illiteracy.

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9. Appendix

Germany: OLS, observations 2008-2016 (T = 9)
Dependent variable: un. rate

	coeficient	*Std. Error*	*t-value*	*p-value*	
const	2026,61	2,05161	987,8154	<0,00001	***
financing	-1,68986	0,23413	-7,2176	0,00017	***

Czech Republic: OLS, observations 2008-2016 (T = 9)
Dependent variable: un. rate

	coeficient	*Std. Error*	t- value	*p-value*	
const	1961,66	104,183	18,8289	<0,00001	***
financing	3,22256	6,66263	0,4837	0,62862	