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Youth Unemployment in Selected EU Countries

Regression Analysis of Macroeconomic Factors Influencing Youth Unemployment

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Youth Unemployment*



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Lyon 2013

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Declaration

I declare that the submitted thesis is original and I have written the diploma thesis of Youth Unemployment in Selected EU Countries solely by myself under the supervision of Haned Naciba, DSc. I declare that I have listed and mentioned all quotations and resources I used in the thesis.

Lyon, August 30th

Bc. Marie KOLAROVA

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Abstract

The current financial and economic crisis has resulted in the worst global recession since World War II having repercussion on soaring sky-high levels of youth unemployment across the world. Well after economies begun to recover, the youth unemployment rates continue to rise and stay stubbornly high. The impact of the economic downturn, driven by a range of factors, has been particularly hard on the youth.

This thesis aims to describe the relations between the youth unemployment rate (as an endogenous variable) and economic factors (exogenous variables entering the research) including unemployment, GDP, government financial liabilities, international trade, labour market policies, consumer price index (/inflation), household saving rate, compensations per employee and public expenditures on research and development. The thesis is divided into two main parts; at first the project presents a brief introduction and an exhaustive literature and empirical review which thematically backs up the importance of the research topic and monitors the current events in the European Union relating to the youth unemployment problem. Secondly, one-equation linear regression model is constructed; through the regression analysis, the most important predictors for understanding economic variables are identified. Furthermore, the proposal presents economical, statistical, and simple econometrical interpretation, followed by the essential application of the regression model.

The main objective of this thesis was to analyse the importance of selected predictors, determine the magnitude and relevance of their influence on the youth unemployment rate, and identify their adequacy for future decisions and labour market developments in the EU.

Keywords: Youth unemployment, European Union, labour market policies, regression analysis, OLS.

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1 Introduction

The phenomenon of youth unemployment has quickly spread around Europe after the world financial and economic crisis hit the European Union resulting in the on-going *Great Recession* – the worst global recession since World War II. As a consequence, the economic downturn led many European countries in worsened economic and social situations – national economies stagnate, government debts rise, international trade balances gets in red numbers, GDPs fall, and unemployment rates soar.

The impact of the present crisis has been particularly severe on the labour market. Millions of workers have been laid off, many have experienced cuts in working hours, lowered wages or decreased benefits as a consequence of economic downturn due to the enterprises' attempts to reduce labour costs and maintain profitability. And it is the destruction of current jobs and duration of unemployment of particular demographic groups that will cause unemployment rates to continue to rise and stay high even after the economy has begun to recover.

And it is in particular the youth unemployment that represents one of the Europe's gravest problems. Youth as a segment of population (as defined by age includes young people between 16 and 24) by its characteristic traits render individuals more vulnerable to recessions and economic downturns. By its nature, when entering the labour market, they face barriers and marginalization; lacking skills, work experience, job search effectiveness abilities and the financial resources to find employment (United Nations 2003, ILO 2006).

Consequently, young people are more likely than other demographic groups to be unemployed or trapped in precarious contracts. Thereunto, during crisis it is increasingly difficult for them to acquire relevant skills on the job market from a position of a new entrant since they remain unemployed; when the hiring freezes, they are very likely to be laid off over the elder workers with experience and skills (Verick, 2009). Furthermore, skill-based technical change increased demand for highly qualified workers over the less-skilled (- firms destroy existing jobs faster; and for newly created positions there are higher proportions of vacancies for the highly-qualified workers). Overall, young people happen to be greatly sensitive to the business cycle; labour market segmentation blocks youth in integration and leads to polarisation and high turnover. Young people are condemned to a vicious circle of uncertainty and insufficient opportunities for specific training and employment.

The unemployment reality in the European Union dated to the June 2013 was 26.4 million people, of whom 19.3 million were in the Euro zone (EU-17). The unemployment has started

increasing staggeringly ever since the financial and economic crisis hit Europe in 2008. The youth unemployment rate was roughly twice as high as the unemployment rate until 2008; however after 2008 youth unemployment soared so that by the end of 2012 the youth unemployment rate was 2.6 times the total rate. According to Eurostat (2012) the youth unemployment rate in the EU-27 in 2012 was at 22.8%; the worst situation reaching highest levels was in Greece 55.4%, Spain 53.2%, Portugal 37.7%, Italy 35.3%, Slovakia 34.0% and Ireland 30.4% (European Commission, 2013).

The impact of the present crisis on the labour market though has varied considerably across the EU countries according to economies' structure, existing policies and responding bodies and institutions. This means that there have been a couple of countries quite remarkably resistant to the economic recession, respectively the unemployment 'crises'. Among the member states, the lowest youth unemployment rate was in Germany 8.1%, Austria 8.7% and the Netherlands 9.5% (the only EU member countries where youth unemployment rate was below 10% in 2012) (European Commission, 2012).

There is an observed diversity within the EU context. Countries like Greece, Spain or Italy have soaring unemployment rates (over 50% for young people), graving government debts; they are sinking deeper into economic recession. Whereas the North-European area has been markedly much more recession-proof with countries like Germany, Austria and the Netherlands keeping their youth unemployment rate persistently around 8%. This discrepancy resulted in developing the notion about 'two-speed' or 'multiple-speed' Europe – the economy structure of individual member states substantially varies and therefore the impact of individual economic factors caused by the *Great Recession* is uneven. European countries geographically in the North have been handling the crisis with more ease, stability and prosperity than countries which are geographically situated in the South.

Such dispersion then negatively affects European stability and sustainability, future European structural development projects. It is therefore important to analyse this topic, determine the factors that influence youth unemployment, look for solutions and adequate measures. The close attention to the topic and efforts to comprehend it should be paid especially by governmental bodies, legislators, academic community as well as the private sector and civil society initiatives, because high unemployment represents not only a threat for the European economy engine (direct economic costs) but furthermore for the social cohesion of the EU (increased crime, mental health problems, violence, drug taking and social exclusion), risking loss of its stability.

To investigate the phenomenon of youth unemployment, the recent labour market developments, government-driven interventions as well as private sector efforts to decrease the youth unemployment rates in particular countries, the research question for the dissertation has been derived: i.e. is youth unemployment in selected EU countries linked to particular macroeconomic factors (predictors)? Precisely, is the unemployment rate, GDP, government debt, consumer price index, compensation per employee, labour market policies expenditures, household saving rate, public expenditure on research and development, and international trade balance enhancing or decreasing the youth unemployment rate in France, Germany, Spain, Poland and the UK?

The hypotheses, based on macroeconomic reality, claim following facts: there is a positive correlation between the unemployment rate and the youth unemployment rate; there is a negative correlation between the change in real GDP and the youth unemployment rate; the government debt influences positively the youth unemployment rate; the household saving rate influences negatively the youth unemployment rate; a correlation between the consumer price index and the youth unemployment rate is negative; the labour market policies negatively influences the youth unemployment rate; there is a positive correlation between the compensation per employee and the youth unemployment rate; the public expenditures on research and development influences the youth unemployment rate negatively; there is a negative correlation between the international trade balance and the youth unemployment rate.

The research question proves its importance not only regarding Europe's future prospects as an aspiring equivalent to an economic power that can successfully compete with rapidly developing regions (e.g. China, India, Latin America, Russia) in today's more and more globalized world. If Europe wants to stay competitive and the European Union wants to attain its position as the most important import market in the world, then solutions on youth unemployment in individual affected countries must be found.

The thesis is divided into four parts: first two sections contains a literature review that is introduced to thematically explain the notion of unemployment as an economic indicator; different types of unemployment are discussed to help understand specifics of the unemployment problem in current economic circumstances; youth unemployment specifics then back up the importance of the research topic. To follow-up, the empirical part of the review monitors the current events in the EU (the impact of both previous and current

financial crises and the subsequent economic contractions) attempting to merge them with already conducted empirical studies on youth unemployment and related economic issues.

Secondly, the research itself is carried out. The empirical analysis uses 10 predictors (macroeconomic factors): unemployment rate, real change in GDP, government financial liabilities, compensation per employee, household saving rate, consumer price index/inflation, labour market policies, public expenditures on R&D, and international trade balance. The main source of the data used for the research is OECD's statistical databases and economic outlook statistics (these were chosen over Eurostat data for its proven reliability and accuracy). The research takes into account economic and labour market developments in 5 selected EU countries: France, Germany, Spain, Poland and the UK. France and Germany represent the core however often polarised EU powers; Spain is an outlier from South European area having the highest rate of youth unemployment; Poland stands in as the 2004 EU-newcomer; and the UK representing 'stable' non-euro economy. Before the econometrical analysis is conducted, statistical approach is applied to present a detailed description of individual variables in each country. Furthermore, the process of gathering and processing data is also provided throughout the paper. The methodology chosen for the research is the regression analysis, using the ordinary last squared method. After evaluating each of the factors, the proposal presents economical, statistical, and simple econometrical interpretation, followed by essentials of application of the regression model. Lastly, cross-examination of the results is conducted in the thesis' analysis of the results, conclusions are drawn.

The main objective of this thesis is to review the trends found in the youth unemployment rates hit by the current financial and economic crisis. Throughout the dissertation, there will be an explanation of what the notion of unemployment refers to and what its implications are. There is a cyclical way in which unemployment rates and levels move, however other factors such as governmentally-driven labour market policies or demographic development have a significant influence on the recent developments on EU labour markets. As derived by research question, the objective is to identify the significance, magnitude and applicability of the influence of particular macroeconomic factors entering the regression analysis on the youth unemployment rates in selected EU member countries.

2 Literature Review

2.1 Unemployment in Economics

2.1.1 Definition and Related Terms

Initial indicator for unemployment is the unemployment rate which indicates the number of unemployed people computed into a percentage of available labour force (European Commission, 2013). The unemployment rate represents an important determining indicator as for economic and social dimension – economic one in terms of unused labour capacity, and social one referring to governments spending more on social security transfers and benefits and also tax revenue being reduced.

The unemployment rate is one of the best-know indicators of labour market. It is an important indicator to measure labour market performance and commonly used to examine shape of an economy. The unemployment rate is regarded as a measure to indicate (in)ability of an economy to generate employment for the labour force – those who are not employed, but are available to work and actively seeking one (International Labour Office, 2011). By International Labour Organisation (ILO), an ‘unemployed’ is defined as *“someone aged 15 to 74 without work during the reference week who is available to start work within the next two weeks and who has actively sought employment at some time during the last four weeks”* (European Commission, 2013).

2.1.2 Types of Unemployment

Economists divide unemployment into different types and categories. Dividing unemployment into particular types helps to shed a light onto the reasons standing behind its occurrence and determine the remedy that can be implemented.

Most commonly, there are distinguished three primary types of unemployment: Structural; Frictional; and Cyclical.

Structural unemployment exists when there is a mismatch of workers' skills and employers' needs on the labour market. Structural unemployment by its long-term tendencies and a need of retraining workers tends to be a significant problem in an economy that needs to be paid a diligent attention to (Economics, 2010) (International Labour Office, 2011).

Frictional unemployment occurs due to temporary transitions of workers (it is a process after a worker quits his or her job and right before he or she enters a new one). The causes may be: imperfect information, failing firms, poor job performance, and obsolete skills (Economics, 2010) (International Labour Office, 2011).

Cyclical unemployment is associated with the business cycle in the economy – cyclical unemployment occurs in recession and depression times and the economic downturn when the demand for goods and services declines. The response of companies usually results in cutting down production and laying off workers, which leads to rise of unemployment (Economics, 2010) (International Labour Office, 2011).

The reality of the unemployment market however is sometimes not easy to be classified and included into one of the three former official definitions. This is a case, when some additional explanatory factors (usually of a qualitative nature) influence unemployment but are not accounted by the International Labour Office.

The economists define so called 'long-term unemployment'. In 'An Analysis of Long-Term Unemployment' Rand Ghayad and Bill Dickens conducted a research showing the relationship between job vacancies and unemployment "*...more jobs becoming available in the recovery has lowered the unemployment rate for people who have only been out of work a little while but not for the long-term unemployed. This suggests that workers who have been out of work for a while are being viewed with a degree of scepticism*" (Ghayad & Dickens, 2013). In other words, the long-term unemployment represents a trap lacking the job-switching that would bring people back to employment.

2.2 Unemployment & Youth

2.2.1 Youth Unemployment

Almost 8 million of young Europeans are not in employment, education or training; the ratio of a young person lacking a job is one in seven in Europe, in Italy and Spain it is one in five, and in Greece even one in four is jobless (The Economist, 2013).

The main reason youth unemployment has soared in particular EU countries is the deep recession these countries are undergoing. The situation has been worsening since 2008 – when the *Great Recession* hit Europe. But the business cycle bringing the economic downturn is not the only reason for the dramatic rise of youth unemployment. The problem gets much broader – and structural. Education plays a crucial role; many young people graduate without gaining the necessary skills to apply at the job market (partly due to their own choices). The whole generation of today's youth is therefore not acquiring skills; young people are not awarded the chance to get any experience on the job market, no working experience. The younger generation has endured more economic hardships than the older generations.

Although policy makers have moved to stabilize the crisis (that hit Europe most severely in years 2008 and 2009) and restore the confidence in markets. EU member states' leaders recognize the need to spur the growth on the markets and pledged in July 2012 120 billion euros spending on infrastructure and employment programmes.

2.2.2 Figures

In the European Union the youth unemployment has reached a historic high with 23.2% of rate in the fourth quarter of 2012 (the Euro area average EU-17 at 23.7%), with about 8 million people affected, this practically mean that almost one in four young people is not employed but available to work. Especially young people that have only completed secondary education represent the most endangered group. The EU average youth unemployment rate in 2012 was 22.8%, but reached 30.3% for low-skilled youth. Although the low-skilled are at the highest risk of unemployment, the highly skilled have suffered the biggest decline (European Commission, 2012).

According to the World Bank (2013), the world has the largest population of youth today than ever before in history, overreaching 1.2 billion young people between 15 and 24 years old. European Union's share on the youth population is 10 per cent (World Bank, 2013)

2.2.3 Specifics of Youth Unemployment

Young people are always those who suffer in recessions. It is them who are no longer hired by employers, and it is them who get laid off because it is easier to do so with new recruits – they are relatively inexperienced, low-skilled, and easily fireable than their elders (The Economist, 2013). Other principle reasons, why youth unemployment tends to be higher than general unemployment is related to the so called ‘job queues’ – graduates entering the labour market find themselves at the end of the queue for employment opportunities (United Nations, 2013). However, it would be incorrect interpretation to think, that gained older people’s jobs are lost for younger ones; young and old people are by and large not substitutes in the workplace. Not only based on the age people gravitate to different industries (e.g. younger people to technology based companies), also the abilities and competencies of an older employee are incomparable to those of a fresh graduate.

Young graduates are very often trapped in numerous internships and endless probationary periods. When they get a job, it is usually part-time or temporary. They may also be over-qualified for the positions they pursue. In many countries, the pre-established payment rates on age categories puts youth workers into even more difficulty – being young means earn less.

Hence there is a growing group of unemployed young people who are becoming less and less attractive for a job market. According to the OECD Employment Outlook (2012) *“...a significant and growing proportion of youth, even among those who would have found jobs in good times, are at risk of prolonged unemployment or inactivity, with potentially long-term negative consequences for their careers, or so-called ‘scarring effects’. These risks include long-term difficulty finding employment and persistent pay differential with their peers”* (Sander, 2012). And it gets very expensive for society; long-term unemployment of an individual lowers his or hers future income level, skills validity and future employability. On top of that, happiness rapidly drops and health level worsens. Individuals suffer. Often high unemployment rates leads to rising crime, depressions, decreased birth rates, increased emigration; *“...the heavy austerity measures imposed on the country are leaving no space for development: rising taxation and wages cuts are making the country less and less productive or competitive. Young people seem to find no hope in their county, and are forced to immigrate in search of a better future. Another big part of them have taken the streets to voice their anger and frustration, and demanding with ascending urge a change”* (Sander, 2012).

The fact is that current generation of youth will be paying for the welfare system and the pensions current elders are benefiting from in the future. Notwithstanding, if they do not start their adult lives with secured and relatively well-paid jobs, they cannot start paying into the welfare scheme (in form of taxes), neither they can spur demand for consumption necessary for the economic growth and recovery.

The European Commission stresses issues of youth unemployment with imperative and tries to put forward actions; the body realises the importance of young European individuals to establish their careers and the future social positing. If they do not catch the early opportunity, not only will their future development be threatened, but the whole country can face upcoming social unrests.

2.3 Youth Unemployment in the EU

In most EU member countries (17 out of 27), the youth unemployment rate reaches above 20%, the situation is even more alarming in five of these countries, where numbers go over 30% - Greece, Spain, Italy, Portugal and Ireland (European Commission, 2012).

2.3.1 Eurostat Indicators

There are three major indicators to summarize the youth situation in the labour market:

- *“Youth **unemployment rate** for those aged 15-24 varied from 7.6% (the Netherlands) to 46.4% (Spain) in 2011. Monthly figures (seasonally adjusted) in 2012 show a worsened situation, with rates ranging from 8% (Germany) to 57% (Greece) in September and July respectively.*
- *The **unemployment ratio**, i.e. the share of unemployed among the population aged 15-24 — instead of its labour force — varied between 4.2% (Luxembourg) and 19% (Spain) in 2011, the EU average standing at 9.1%.*
- *The third statistic is the population aged 15-24 **not in employment, education or training (NEET)**. The EU average in 2011 was 12.9% and this varied between 3.8% (the Netherlands) and 22.6% (Bulgaria)”* (European Commission, 2012).

The EU average of young people not in employment and not in any education and training (NEET rate) reached to 13.2 per cent in 2012 (Eurostat, 2013).

As European Commission study on youth unemployment shows: *“Labour markets are segmented in a way that young people are overrepresented in temporary jobs: in 2012, 42% of young employees are working on a temporary contract (four times as much as adults and accounting for nearly 30% of those in temporary employment) and 32% work part-time (nearly twice the adults' rate – 25-64). There are fewer and fewer permanent jobs for young people, a trend that has persisted since 2008. Long-term youth unemployment is on the rise: on average, 30.1% of the young unemployed have been jobless for more than 12 months. The long-term unemployment rate increased by 3.7 percentage points (to 7.3% of the young labour force) between 2008 and 2012, compared with a 1.8 point increase for adults (to 4.3%). Eurofound estimates that in 2011, the cost of young people's unemployment or inactivity (i.e. the costs of young people being considered to be NEET) was the equivalent of 1.21% of GDP, i.e. an annual loss of €153 billion for the EU. The re-integration into employment of just 10% of these young people would create a yearly gain of more than € 15 billion”* (European Commission, 2012).

2.3.2 Figures for EU-27

According to the Eurostat, 22.8% of young people were unemployed in Europe in 2012.

Table 1: The Youth Unemployment Rate; Source: (Eurostat, 2013)

GEO/TIME	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
EU-27	18,5	19,0	18,8	17,5	15,7	15,8	20,1	21,1	21,4	22,8
Euro area (17)	17,3	18,2	18,3	17,0	15,5	16,0	20,3	20,9	20,8	23,1
Belgium	21,8	21,2	21,5	20,5	18,8	18,0	21,9	22,4	18,7	19,8
Bulgaria	26,6	24,3	21,0	18,3	14,1	11,9	15,1	21,8	25,0	28,1
Czech Republic	17,6	20,4	19,3	17,5	10,7	9,9	16,6	18,3	18,1	19,5
Denmark	9,2	8,2	8,6	7,7	7,5	8,0	11,8	14,0	14,2	14,1
Germany	11,6	13,8	15,6	13,8	11,9	10,6	11,2	9,9	8,6	8,1
Estonia	20,8	21,6	16,1	11,9	10,1	12,1	27,5	32,9	22,3	20,9
Ireland	8,7	8,7	8,6	8,7	9,1	13,3	24,0	27,6	29,1	30,4
Greece	26,8	26,9	26,0	25,2	22,9	22,1	25,8	32,9	44,4	55,3
Spain	22,6	22,0	19,7	17,9	18,2	24,6	37,8	41,6	46,4	53,2
France	19,1	20,8	21,3	22,4	19,8	19,3	24,0	23,6	22,8	24,6
Italy	23,6	23,5	24,0	21,6	20,3	21,3	25,4	27,8	29,1	35,3
Cyprus	8,8	10,2	13,9	10,0	10,2	9,0	13,8	16,6	22,4	27,8
Latvia	19,9	20,0	15,0	13,5	11,9	14,5	36,2	37,2	31,0	28,4
Lithuania	24,7	22,1	14,9	8,6	6,8	12,2	29,0	35,3	32,2	26,4
Luxembourg	11,2	16,4	14,6	15,5	15,6	17,3	16,5	15,8	16,4	18,0
Hungary	13,2	15,5	19,4	19,1	18,1	19,9	26,5	26,6	26,1	28,1
Malta	17,4	16,6	16,8	15,9	13,9	12,2	14,4	13,1	13,8	14,2
Netherlands	7,3	9,0	9,4	7,5	7,0	6,3	7,7	8,7	7,6	9,5
Austria	8,1	9,7	10,3	9,1	8,7	8,0	10,0	8,8	8,3	8,7
Poland	41,9	39,6	36,9	29,8	21,6	17,2	20,6	23,7	25,8	26,5
Portugal	17,8	18,9	19,8	20,1	20,4	20,2	24,8	27,7	30,1	37,7
Romania	19,5	21,0	19,7	21,0	20,1	18,6	20,8	22,1	23,7	22,7
Slovenia	17,3	16,1	15,9	13,9	10,1	10,4	13,6	14,7	15,7	20,6
Slovakia	33,8	33,4	30,4	27,0	20,6	19,3	27,6	33,9	33,7	34,0
Finland	21,8	20,7	20,1	18,7	16,5	16,5	21,5	21,4	20,1	19,0
Sweden	17,4	20,4	22,6	21,5	19,2	20,2	25,0	24,8	22,8	23,7
United Kingdom	12,2	12,1	12,8	14,0	14,3	15,0	19,1	19,6	21,1	21,0
Norway	11,2	11,2	11,4	8,8	7,2	7,3	9,2	9,2	8,7	8,6
Croatia	34,7	32,8	31,9	28,8	24,0	21,9	25,1	32,6	36,1	43,0

The situation is very severe in majority of EU member states; however there are few apparent differences between the member states. In particular, the situation in Germany, Netherlands, Austria and Norway is nothing like the rest of the EU area.

2.3.3 Existing Policies

There has been a developed notion that high unemployment among young people arose as a result of countries' welfare policies in social security. Also, a rather protectionist behaviour on labour markets contributed to certain extent. Another reason behind stubbornly high levels of youth unemployment might be that government policymaking processes lack participation of youth representatives themselves.

When governments are overly focused on building social welfare, the incentive for employment reduces. Meaning states pay up on social security transfers such large amounts, that unemployed feel convenient and to a certain measure secured staying unemployed.

Another dissuasive criteria determining the situation is immoderately stringent laws (that protects workers and therefore ensure job security) makes companies not want to hire labour. They rather prefer to outsource the labour to other countries, use machinery or hire only temporary workers or even illegal immigrants. Narrowly, these policies are a reasoning force behind high youth unemployment levels being more than twice as high as the average in particular for some European countries.

What is unfortunately the case for many European governments is the fact that the barriers created during the legislative processes put strains on companies which are for them often too high to be overcome and therefore are making it either difficult or rather unpleasant for hiring new workers. Sometimes it is, as a matter of fact, not as difficult to hire a worker as to fire him – many governments require companies to declare why they are firing someone (the reason behind the legislation is to protect the rights of the citizens since they are considered to be the weaker partner during negotiating processes with corporate employers), however this create the barrier for firms which makes them likely to employ less people.

Moreover, governments sometimes require companies to provide fired employees with extremely generous so called severance packages. All the reasons mentioned above, make together the companies very reluctant to hire entry level applicants and therefore actively participate in a labour market. The costs the company have to pay either when firing a person or putting temporarily aside employees for whom they do not have at a time enough work since the demand has persistently dropped, are too high.

The Dutch Economist Harald Sander in his research suggests that based on the most recent economic developments, labour market institutions are becoming more significant than in previous recession and their direct policy response to the crisis play a crucial role. *“In particular, Germany’s short term work schemes allowed (and financed) the reduction of working hours instead of dismissing workers has been considered to be very successful in both, keeping unemployment rates in check and stabilizing domestic demand and thus the economy. Moreover, and contrary to conventional wisdom, it is shown that more liberal labour markets are not a beacon to reduce the impact of recessions on employment. ...stricter employment protection legislation has been helpful to mitigate the impact of the greater recession on the unemployment”* (Sander, 2012), based on author’s calculations of data reproduced from the OECD statistics.

On the other hand, free-market economists see a solution in clearing away the government-imposed obstacles preventing hiring people. According to them, the government is to be blame for high minimum wages that discourage companies from hiring perspective young people because the fresh graduates had not had the chance to acquire tangible knowledge through job experience to justify being paid government-decided minimum wage. According to the Bloomberg Businessweek (2012) the evidence is that high minimum wages exclude some young people, while benefiting others for the rise of their salaries (Bloomberg Businessweek, 2012). This argument of free-market economists suggesting negative effects of workers protections did not however convince countries like Germany or Austria that maintain their long-time established employment regulation with successful results and yet ‘healthier’ job markets than other countries with fewer legislative regulations.

Economy policymakers have been really challenged by the task to solve the most recent European unemployment crisis. The question to be addressed at the first place is whether Europe should develop a coordinated strategy to reduce unemployment or whether individual governments of all EU-27 member states should be those in charge to make adequate policy decisions both micro- and macro-oriented.

2.3.4 The EU Policies in Place

One of the main concerns of policymakers in the European Union is the long-term unemployment. The reason behind this is that not only it has financial and social effects on the people's lives, there is also a risk of clashes in already very delicate social cohesion. Furthermore, by high levels of unemployment the economic growth is being hindered.

European Employment Strategy

The European Commission department profiled in Employment, Social Affairs & Inclusion has developed the so called 'European Employment Strategy' to help respond to the labour market crisis that has been economically speeding down Europe since its boom in 2008. A partial reason why Europe has been hit so hard by the recent crisis might be that it had not really coordinated its efforts. European governmental economic and fiscal policies had not responded, neither promptly nor co-ordinately, therefore the European Commission is putting forth the effort and has elaborated the 'European Employment Strategy'.

The strategy seeks to create more jobs within the EU area, as well as better attainment of job opportunities. The measures to reach the set goals by 2020 are as follows:

- *“75% of people aged 20-64 in work;*
- *school drop-out rates below 10%,
and at least 40% of 30-34-year-olds completing third level education;*
- *at least 20 million fewer people in or at risk of poverty and social exclusion”*
(European Commission, 2011).

To meet these targets, European Commission has introduced actions to be carried out in a so called 'Agenda' for new skills and jobs:

- *“Promote better anticipation of future skills needs;*
- *Develop better matching between skills and labour market needs;*
- *Bridge the gap between the worlds of education and work”*
(European Commission, 2011).

The measures that are designed to help workers comprise of: life-cycle approach to work promotion, lifelong learning process encouragement and adaptation of training systems. There is a particular appeal on actions that would increase female participation and reduce existing gender gap. Introduction of the easily accessible and financially affordable childcare is widely encouraged as well.

All the efforts mentioned above are not entirely new; however all that Europe had managed to achieve since the previous strategy in 2000 was severely damaged by the economic crisis. Therefore the efforts must be mobilized again in various projects and proactive policies aiming at education and training, creation of easy working environment and higher labour productivity. The process is a long run; diligent monitoring and reporting must be put in place, and most importantly the coordination which has been lacking markedly when the EU area was hit the economic crisis.

The ‘European Employment Strategy’ provides a framework EU member states. It serves as a platform to share information as well as to discuss different approaches and positions concerning employment policies with the final goal to coordinate and find a feasible solution.

Youth Opportunities Initiatives

European Union has implied the imperative to focus on young people. The ‘Youth Opportunities Initiatives’ is an approach that includes measures for the 2012-2013 in order to drive down youth unemployment. It is a partial branch of the globally promoted EU’s ‘Youth on the Move’ initiative – that has complex focus on education and employment.

The aims of the ‘Youth Opportunities Initiatives’ are to help young people who has just finished formal education and attained their diplomas to gain their first work experience; help youngsters that did not finish the school to get an appropriate vocational training – that would make them competitive on the labour market and enabled them to get the in-demand skills.

The ‘Youth Opportunities Initiative’ was introduced as a pilot project in 8 EU countries with the highest youth unemployment rates: Spain, Italy, Greece, Portugal, Ireland, Latvia, Lithuania and Slovakia. The European Commission “*claimed in May 2011 that the move would benefit at least 460,000 young people and 56,000 small businesses*” (Europa.eu, 2012).

The ‘Youth Opportunity Initiative’ is financing following moves:

- *“Using €4m to help Member States set up 'youth guarantee' schemes to ensure young people are either in employment, education or training within four months of leaving school.*
- *Dedicating € 1.3 million to support the setting up of apprenticeships through the European Social Fund. An increase of 10% by the end of 2013 would add a total of 370,000 new apprenticeships.*

- *Using €3m of the European Social Fund Technical Assistance to support Member States in the setting up of support schemes for young business starters and social entrepreneurs;*
- *Gearing funds as much as possible towards placements in enterprises and targeting at least 130,000 placements in 2012 under ERASMUS and Leonardo da Vinci;*
- *Providing financial assistance in 2012-2013 to 5,000 young people to find a job in another Member State through the 'Your first EURES job' initiative*
- *Reinforcing the budget allocation for the European Voluntary Service in order to provide at least 10,000 volunteering opportunities in 2012;*
- *Presenting in 2012 a framework for high quality traineeships in the EU;*
- *Ensuring around 600 further exchanges under Erasmus for entrepreneurs in 2012”* (Europa.eu, 2012).

To achieve the above mentioned set of goals, the program must be facilitated through stronger partnership between governmental authorities and the private sphere – such as business and trade unions; the supranational EU institutions and national governmental bodies must cooperate on regional and local levels. European Union provides guidance and assistance on how to conduct these policies. The European Commission is assessing each participating member state on its national reforms.

Youth on the Move

‘Youth on the Move’ is a global package of education and employment policies that targets young people across Europe. The main goal is to improve the employability of young people as well as to reduce the current unemployment that is worrying Europe. The officially stated goal is pronounced to: *“increase the youth employment rate – in line with the wider EU target of achieving a 75% employment rate for the working-age population (20-64 years) – by:*

- *making education and training more relevant to young people's needs;*
- *encouraging more of them to take advantage of EU grants to study or train in another country;*
- *encouraging EU countries to take measures simplifying the transition from education to work”* (European Commission, 2010).

3 Empirical Review

The following chapter attempts to merge experiments on youth unemployment and recent development on the EU labour market depicted in research studies and scientific journals with current happenings in the EU related to the youth unemployment and its recent developments. Issues discussed range from the effectiveness of European labour market programmes, to the impact of education on unemployment, consequences of graduating from college in a bad economy, work search effectiveness etc.

3.1 Current Events Regarding Youth Unemployment

Around the globe, unemployed youths are taking into the streets: in Tunisia they are named *hittistes* (they helped bring down the dictator), in Egypt the youth unemployed are *shabab atileen*. But not only ‘Arab Spring’ countries (that made themselves to be heard around globe) experience recent youth movements; caught into an unsaved situation of their generations they are urged to take into the streets and to be heard. In Britain, they are referred to as *NEETs* – ‘not in education, employment, or training’. In Japan, they call them *freeters*. In Spain, they became *mileuristas* (standing for they earn monthly no more than 1,000 euros). In the U.S.A., they became ‘*boomerang*’ kids – meaning they move back home after college because there is no work for them to be found. It is a case even in fast-growing China, ‘*ant tribe*’ are recent college graduates who live together in big cities in cheap flats, because they cannot find a work that is well-paid (Bloomberg Businessweek, 2012).

World’s most important economies are facing a common problem – ‘the youth unemployment bomb’ – these economies are unable to generate enough jobs that would be able to absorb young people eager to work, college graduates, new generation of workers.

In Britain, college and university students are outraged at the proposal of yet another tuition increase. What fills British students with indignation is the fact, that college education is no more guarantee of prosperity. The students’ demonstrations have not been anything new across other parts of Europe in recent years. The common problem behind dissatisfaction of European youths is ‘failure’, failure of older generations to create conditions for their children to find their ‘use’, build their career, and find a place in society. Former Italian Prime Minister Giuliano Amato described the situation by saying: “*The older generations have eaten the future of the younger ones*” (Bloomberg Businessweek, 2012). British Minister of Education addresses the situation as a ‘ticking bomb’. Why is across the political and

especially scientific community increasing worrisome concerning youth unemployment? Jack A. Goldstone, a sociologist at George Mason University School of Public Policy, described the issue as follows: *"Educated youth have been in the vanguard of rebellions against authority certainly since the French Revolution and in some cases even earlier"; "In December the French government released a report on the Nation's Sensitive Urban Zones, also known as banlieues, which said that the young men in the neighbourhoods find it 'extremely difficult' to integrate into the economic mainstream. The heavily Muslim banlieues exploded into rioting in 2005; last year a series of violent attacks there brought police face to face with youths brandishing"* (Bloomberg Businessweek, 2012).

The mood resembles agony – the young and unemployed are feeling bored and demoralized. Many of them have given up the search for a job – they decided to rather 'sit on coach' but more importantly have stopped developing professionally. So when finally jobs come back, employers might reach not to today's unemployed (who has been losing a track with recent developments in their fields) but to the next fresh graduates. Today's youths therefore will have to bear long-term negative consequences even after the countries come out of the economic recession. A psychological effect of the situation – graduates unsuccessful in job search will tend to think that career success does not depend on effort, but luck. Inevitably, they become less confident in their abilities. Hence being unemployed at a young age has negative and scaring effects, even facing the risk of exclusion, no long-term employment, no career prospects.

What is the cause behind young graduates not finding their way to utilize their diplomas in employment? One of the reasons is that some countries coped with the unemployment problem by expanding college enrolments and now the same countries have produced more college diplomas than it can make use of. This is a typical problem of China, though the economy is growing and labour demand did not decrease, the number of graduates multiplied five times and the economy has not been able to create the demanded jobs for high-skilled labour (Bloomberg Businessweek, 2012). Young people after investing years and not negligible financial means into their education, then naturally reject to accept the work that is below their qualification and desired remuneration (often desperately needed to be able to start paying off the tuition debts).

3.2 The Euro Area

Europe's youth is in most of the EU countries suffering from high and persistent unemployment rates which negatively affect their future career prospects. At the end of 2012, more than 5.5 million young people were out of employment in the 27 EU member states countries. General economic condition is unavailing and raised youth unemployment has affected majority of 27 EU member countries. The exceptions were Austria, Netherlands, and Germany. Specifically Germany, respectively its labour market, has shown incredible resilience to the crisis – youth unemployment remained unaffected.

The youth has been hit particularly hard (from all the other demographic groups) by the economic crisis. The Dutch economist Harald Sander in his research paper for the Youth Conference in the Netherland, September 2012, suggests that the economic downturn's impact in Europe *“has been threefold:*

- (1) by the Great Recession starting 2008 where the negative impact could at least partly been smoothed out by fiscal and monetary stimuli,*
- (2) by the subsequent debt and economic crisis in several Euro-zone countries, and*
- (3) by the still-on-going threat of a break-up of the Euro-zone with the potential of further-deepening and already deep crisis.*

Today youth unemployment rated in Europe are 2.5 times higher than overall unemployment rates with peaks in problem countries like Spain where youth unemployment stands above 50 %” (Sander, 2012).

Another determinant for the EU's rising unemployment to be considered is a structural shift Europe has been undergoing since the past couple of decades. Skill-biased technical change has increased the demand for high-qualified labour and decreased the demand for less-skilled workers. Due to the technological progress enterprises have been destroying existing jobs faster and have been opening new ones with a higher proportion of vacancies for the high-qualified. The average rate for finding employment decreases; the skill upgrading is slow and therefore a mismatch of relevant skills on the job market increases.

Based on the determinants of the unemployment rate stated above, the solutions to the current youth unemployment crisis should be looked for on a macroeconomic level.

The EU leaders declare youth unemployment to be the ‘most pressing problem’; they have promised a ‘Youth Guarantee’ program, under which European youth will get a job, apprenticeship or higher education possibility within four months of becoming unemployed. They have made a pledge of providing 8 billion euros into a fund that will help fight youth unemployment in the worst-affected countries. The European Investment bank is to help small business to take after – employ and train – young graduates. There is also a thought to create a version of EU’s Erasmus program (study abroad program) that will help more people conduct internships and apprenticeships abroad (The Economist, 2013). The question is, whether the proposals will be introduced into practice as fiery as they are proclaimed. Because what has been a signature feature for the EU in the last (times of crises) couple of years was the lack of decisiveness, boldness or endeavour to change the policies and try to copy German’s successful pattern.

However, the apprenticeship program itself does not solve the economic recovery – very much needed for the youth unemployment remedy and most importantly a reason behind the current youth unemployment ‘ticking bomb’.

3.2.1 The EU Labour Markets & Youth Unemployment

O'Higgins (2012) in his researched on youth unemployment in European countries discovered that reactivity between the youth employment and GDP developments has risen dramatically after 2007 – youth were hit particularly hard by the great recession. The magnitude of response to the recession varies between particular countries, though. Bernal-Verdugo et al. (2012) presented in their findings that “...in countries with more flexible labour markets, the impact of financial crisis is sharper but short-lived. Conversely, in countries with more rigid labour markets, the effect of financial crisis appears to be initially more subdued, but highly persistent. The effects are more pronounced for youth unemployment in the short term, perhaps underscoring their higher vulnerability as well as declining labour market participation in the medium term” (Bernal-Verdugo, Furceri, & Guillaume, 2012). O'Higgins suggests a similar thing, attributing the different response to the recession between individual EU countries to the responsiveness of youth unemployment to adult unemployment; adult (or overall) unemployment is according to the O'Higgins rooted in different institutional structures of the youth labour market (O'Higgins, 2010).

There exist excessive amount of literature (going beyond the scope of this thesis) that is rather contradictory on the issues of employment protection. But what can be concluded in general is that the structural reform cannot be done single-handedly without paying attention to cyclical problems. Also more flexible labour markets are not a simple solution to the youth unemployment since many authors suggests (e.g. O'Higgins, 2010), that the mode of temporary contracts is behind the rise of youth unemployment due to ease in which workers are fired (/hired). That can be for instance demonstrated on a German's example, where less flexibility on the labour market helped to keep workers in jobs and revive the economy (Sander, 2012). At the same time, it is important to keep in mind, that there is no single manual for all countries (and their economies).

3.2.2 Current and Future Costs of Youth Unemployment

Exclusion of youth from the employment process not only has scaring effects and large societal costs. The economic loss is not negligible either. The ACEVO Commission on Youth Unemployment finds out that the costs are of about £15.5 billion pound sterling, which is an equivalent of 1% of UK's GDP. More in detail, £4.2 billion are welfare benefits paid, £0.6 billion are taxes forgone, the biggest part is amounted to £10.7 billion and represents loss in output (ACEVO, 2012).

The ACEVO Commission has also attempted to calculate in its report the future costs of scaring effects. *"...individuals unemployed at a young age will on average spend approximately an extra 2 months per year out of work aged 26 to 29 than they would have done otherwise ...for men unemployed at a young age, the average wage penalty by the age of 30/34 will be just under 16%, with the equivalent figure for women being just over 17%; given the different average earnings and spells in employment for men and women, that equates to men earning just over £3,300 less per year by their early thirties, and women earning just under £1,800 less per year in the same period. For comparison, estimates of the earnings premium to a university degree in the UK are typically about 20-25%"* (ACEVO, 2012).

Altogether, the future scaring cost ACEVO Commission calculated amount to £9.2 billion per year. Future benefit payments are £0.7 billion, future tax losses of £2.2 billion, and a loss of future output makes £6.3 billion per year (ACEVO, 2012).

Indicated repercussions justify the graveness of youth unemployment in our geographical area. The whole generation of youth that was not fortunate to enter successfully the labour market is being scared – they are condemned to a vicious circle of uncertainty, insufficient job opportunities; blocked from labour market integration.

3.3 The EU Member States' Differences

When searching for the answers to the European youth unemployment and comparing unemployment rates and levels for individual member states, it becomes very obvious that not the whole EU-27 area has the same high unemployment rate. Why it is that unemployment in some European countries is so high and why on the other hand it is relatively low in other European countries? The reason standing behind such a variety could be stated as follows:

We can observe that only some European countries have a high level of unemployment. For example countries such as Germany, Norway or Sweden have actually lower unemployment levels than USA. Who are than those countries which in fact have high levels of unemployment? Those can be generalised as countries which tend to have at the same time high levels of national debt – most significantly represented by Spain, Italy and Greece.

Spain, Italy and Greece are countries with the highest level of national debt (within the EU-27 area) meaning it is immensely difficult for them to get access to the loans they need to finance either their national budgets/deficits or pay off existing debts – ensure the running of the country. In fact, the interest rates for these three countries they pay on the debt has risen up to about 6% in some cases (for comparison other countries borrow at the interest level of 1-2%). As a consequence, these countries do not have much of a choice than to cut their expenses if they want to bring down the debt cost, which means that the public sector budgets losses money and therefore the unemployment rises – in some countries to great extent – Spain, Italy and Greece.

Another similarity linking the three above mentioned countries indicated as those with the greatest unemployment problems within EU-27 is that when they were entering the Euro area (Euro-zone monetary market) they were in much worse economic shape than any other countries who has adopted Euro currency. It was extremely difficult for these three countries to narrow the discrepancy between their weak economies and the standard the leading Germany has set. To a certain extent, the introduction of euro currency followed by rise in prices in Mediterranean member states and increased living costs might have contributed to the fact that Spain, Italy and Greece are nowadays the most harshly hit by the economic crisis and related unemployment from all of EU member states.

Despite the economic reasons mentioned above, it is important not to forget rather socially-cultural background that is behind the unemployment phenomenon. Some European countries have utterly different social policies. Several of them offer very generous indefinite unemployment benefits which serves to its purpose maybe even beyond its origin – to reduce the hardship of being unemployed. Consequently, many unemployed workers have been collecting and benefiting from this system for more than couple of years and immensely got used to the generosity of their governments' unemployment policies.

3.3.1 Spain

The country affected the most by the European unemployment crisis is Spain. In just 4 years, Spain has lost 2.9 million jobs. In average it takes a new job market entrant 15 months to find a work. The youth unemployment reaches the highest of above 50 per cent (this means that more than half of Spanish youngsters – between 16 and 24 – are jobless, the total number of unemployed fluctuates around 5 million people (The Economist, 2012) (Eurostat, 2013).

The youth in Spain has been dubbed ‘Spain’s lot generation’, ‘generación cero’ or ‘the ni-nis’ – which means that people between the ages of 16-24 are neither in work, nor in full-time education. The number of youth unemployed soared to 51.4 % in December 2012, which represented more than a double rate of European average. The only solution, many find is migration and seeking jobs abroad. Spain is facing a serious risk of a brain drain; Ignacio Escolar (author of the country’s most popular political blog) describes the situation as...*"this is the least hopeful and best educated generation in Spain... and it's like a national defeat that they have to travel abroad to find work"* (Govan, 2013).

At the beginning of the financial crisis in 2008, the youth unemployment in Spain was below 18%, however within 4 years, the rate nearly tripled, the real estate market collapsed and the country sank into recession. As a consequence the average age of young people’s independence is prolonged up to their thirties; they are staying home with their families longer than ever before and delaying their advance into adulthood.

The ILO warned in a report from October 2012 that consequences of mass youth unemployment may lead to *"...increased crime rates in some countries, increased drug use, moving back home with the parents, depression – all of these are common consequences for a generation of youth that, at best, has become disheartened about the future, and, at worst, has become angry and violent,"* (Govan, 2013). *"Spain already has one of the highest rates of cannabis and cocaine usage among its young in Western Europe. The botellon, the social activity for younger people of drinking alcohol in public areas such as the streets, has also increased in popularity leading to police clampdowns. Young Spaniards led the protests throughout last summer, setting up camps in plazas across Spain in the movement that became known as "Los Indignados" – the indignant ones. They complain that even a university degree leaves no guarantee of finding work"* (Govan, 2013).

What led Spain into the youth unemployment crisis were serious shortcomings in its education system and labour market deficiencies. Within the affected countries with highest rates of youth unemployment, Spain has stood out for its high rate of early school leaving (which is a percentage of the population between 18 and 24 that has neither completed higher secondary education and is nor participating in any training) for the last two decades (García, 2011). *“The effect of early school leaving on youth unemployment has become clear during the current crisis. For example, unemployment among youngsters with the lowest level of education rose almost 30 percentage points (pp) between 2007 and 2010 to 49.6%, 15.3pp more than among those who reached the second stage of secondary education and 20.7pp more than those who obtained a university degree...The polarisation of Spain's educational attainment has given rise to an imbalance between the supply and demand for qualified work, resulting in high levels of graduate unemployment compared with elsewhere in Europe, significant underemployment – or over-qualification – and a drop in the education wage premium”* (García, 2011).

The repercussion caused by leaving the education system before completing the higher secondary education can have very negative and sometimes even persistent effects on the professional careers of the young – the school-dropouts are lacking knowledge that is considered as basic and therefore the transition from school to work is aggravated; also their position in labour market is not favourable by considering their lower propensity to participate in training or vocational activities throughout their future working lives.

The other extreme determining the Spanish job market is the oversupply of university graduates. Over-qualification of university graduates and high rates of school-dropouts with the lowest level of education explain the staggeringly high values of youth unemployment rate in the country. Related to the technology progress, the demand for non-qualified workers has been reduced and replaced by demand for qualified ones; as a result, qualified workers take over positions that were traditionally meant for non-qualified workers – in virtue of either an oversupply of labour or due to the increased hiring standards driven by employers.

Altogether, education system deficiencies, labour market malfunctions and ineffectiveness of active employment policies play a role to be blamed for the alarming situation of youth unemployment in Spain.

Reform must be introduced; these provisions however are very unpopular and Spanish executive representatives were aware of this fact even before the reform measures entered into force – famous incident when Spanish Prime minister Mariano Rajoy was caught on the assumingly switched microphone expressing fear that his proposed labour reform would provoke strikes. And so it happened as soon as the reform was unveiled.

By spring 2012, the country had proposed third reform in two years to deal with economic recession and provide tools and measures for survival inside euro zone: the idea was to push the average salary down, which would bring back competitiveness and Spain could again start relying on its former export strength; demand for export would thus create larger amount of jobs as well as more job opportunities. Government is also trying to cut the red tape – facilitate for enterprises and businesses to lay off workers when the demand is not high enough and companies cannot provide any work for their employees. The concrete proposal in Spain is to reduce lay-off payments from at that time 42 months on the payments insured for newly proposed 12 months (The Economist, 2012).

Introduction of such measures is expected to boost the businesses to grow; reform changes will finally clear labour rules and take down obstacles enterprises has been facing over the current crisis. Steady labour market out-dated rules from Franco era breaks down; stringent law concerning working hours and wages loosens (it enables enterprises negotiate shorter working hours or lower level of wages), big redundancy pay-offs or ‘ironclad’ contracts wears off. Hence, the new law proposal should help people to get into stable employment.

It is not only government however to undertake necessary steps in order to make reform viable. A lot also depends on labour unions and their agreement with employers, whether they are willing to limit rise of payments for the period of next three years. Introduction of such a limitation would help to protect the jobs.

3.3.2 The UK

British Deputy Prime Minister Nick Clegg in his speech from 27 June, 2012, CBI conference: *“Youth unemployment isn’t just an unforgivable economic waste – it’s a human tragedy too”* (Lanning & Rudiger, 2012).

The proportion of British youth of 18 to 24 years old that is neither in education nor training nor employment reaches 18.4 per cent, the number even exceeds by two per cent the EU average which is at 16.4 per cent. Thereunto, the UK has the largest absolute number of unemployed young people – at over a million – of all EM member countries (Lanning & Rudiger, 2012).

The rise in youth unemployment in the UK began in 2004, which is well before the onset of the current economic downturn recession. Thereunto, the latest recession has been the worst in its magnitude for UK since the war. The rise of unemployment then began dramatically and has brought it to the top of government’s agenda. *“Traditionally, concern about youth unemployment in the UK has centred on the skills efficiencies and lack of work ethic among young people, and on the failure of the education system to produce ‘job-ready’ young workers. Record high youth unemployment following the global financial crisis has shifted this debate to some extent, with increasing recognition that young people, and particularly those who do not go to university, face a tough job market and a lack of support during the transition from school to work”* (Lanning & Rudiger, 2012).

Barbara Petrongolo and John Van Reenen attempted to find an explanation for the current sky-high youth unemployment rates and why youth unemployment started to rise well before the recession began. Their findings suggest that magnitude of unemployment of youth widened dramatically during recession because employers were reluctant to lose experienced workers with specific skills and even greater redundancy costs; employers preferred to lay-off low-experienced and not skill-based youth. This is the reason, why unemployment of young people has increased by more than the one of adults. Findings show a significant fall in hours for young compared with older groups, on the top of that wages has flattened or fallen for youth (Petrongelo & Van Reenen, 2011). The brought up facts prove, that young people have been much more sensitive to the economic downturn than other demographic groups.

The fact that young people suffer more during recession has been known well before. What represents a bigger problem is what happened before the recession – the bulk of the rise in youth unemployment in UK between 2004 and 2008. Petrongolo and Reenen has identified

following 6 six factors that are possibly accountable for graveness of the situation: rising migration, changing structure of welfare-to-work benefits, the minimum wage, education and school-to-work transitions (Petrongelo & Van Reenen, 2011).

Although *“evidence shows that a one percentage point increase in the proportion of foreign-born in the working age population is associated with an increase in youth unemployment of 0.43 percentage points, holding the state of the business cycle constant. So it might be concluded that foreign migration harms the job prospects of young people.”* However, *“...excluding London from the sample, the correlation between youth unemployment and the migration rate is basically zero”* (Petrongelo & Van Reenen, 2011). Based on the research, immigrants do not seem to have large harmful effects on the youth unemployment in UK. In 2004, the Employment Service in UK was given incentives to focus more in their policies on other groups (e.g. lone parents) than youngsters (as done in previous years). *“Although there is no rigorous evaluation of this change, the timing does suggest that this may have been a cause of the rise in youth unemployment before the recession”* (Petrongelo & Van Reenen, 2011).

The research suggests that the increase in the UK’s minimum wages in 2003 had minimum impact on unemployment for all demographic groups, including youngsters. *“Furthermore, if minimum wages were to blame, we would expect a positive jobs effect on teenage apprentices, who were exempt from the 2004 legislation. In fact the job rates of 16-17 year olds fell from 15% in early 2003 to 13% in early 2007, casting doubt on the minimum wage explanation”* (Petrongelo & Van Reenen, 2011). Falling demand for low-skilled workers is proven by the introduction of ‘skill-biased’ technologies and increasing demand for skills in the labour market. *“A rise in demand for human capital may disproportionately hurt the young because they have less experience. But this explanation is not so persuasive for explaining the post-2004 changes, as youth unemployment was falling in the period 1992-2004 (and for parts of the 1980s) even in the face of this rising demand for skill. Thus, although skill biased technical change has a lot to do with longer-run trends in wage inequality, it is not a good explanation for the rise in youth unemployment after 2004”* (Petrongelo & Van Reenen, 2011).

In sum, the labour market in the UK has been quite stable so far in comparison with other far worse ‘affected’ EU countries, given the depth of the latest recession. Youth labour force, however, has experienced large increases in unemployment and bigger falls in hours and wages. The change in minimum wage, rising immigration and declining demand for skills

on the labour market do not seem to be blamed for the rise in youth unemployment as depicted by researches Barbara Petrongelo and John Van Reenen (2011). Still many capable young workers seems to be failed by the system; there is a lacking support securing the school-to-work transition; the youngsters are condemned to a vicious circle of uncertainty, they have insufficient opportunities for particular training and employment.

Hence, abolishing long-term unemployment would help to mitigate the worst effects of the crisis. With youth unemployment currently around 18%, it is important to place policies as follows in action: maintain strong welfare-to-work incentives, keep young people attach to labour market, introduce apprenticeship programmes to ease the transition for youngsters from school to works, or improving career guidance at schools could be a way to improve the position of youth in the future (Petrongelo & Van Reenen, 2011).

Additionally, researches Tess Lanning and Katerina Rudiger advice in their study paper on Youth Unemployment in Europe: Lessons for the UK to implement the threefold strategy:

- (a) *“Reduce long-term unemployment among young people, and its ‘scarring’ effect, by adopting measures such as a Youth Guarantee, which provides young people out of work for more than a year access to a high quality training placement or paid job.*
- (b) *Create more diverse, high quality routes into work, in particular by strengthening the quality of apprenticeships and other vocational qualifications. This should include early exposure to the workplace through high quality work experience and internship placements.*
- (c) *Develop a single youth policy agenda with joined up policy-making across government departments”* (Lanning & Rudiger, 2012).

3.3.3 France

The ‘lost generation’ phenomenon of unemployed youth has most recently spread from Southern Europe (most knowingly Spain) to France. The problem has been getting very serious; by the end of 2012 the youth unemployment in France soared to 25.5%, featuring France right behind Spain, Italy and Greece.

The Great recession had opposed effect in France than in other countries – specifically in Germany; French GDP has not been influenced as significantly as in other EU countries (e.g. Germany), however the recovery from the recession took longer than in Germany.

There is quite significant structural difference between France and Germany (as two polar examples of countries that endured the recession and are struggling/maintaining the youth unemployment) in labour market institutions and labour policies. As the authors the research paper *Youth Unemployment in Old Europe: The Polar Cases of France and Germany* suggest the causes may be in following issues: vocational education and training; minimum wages and employment protection; and activation measures and labour policies (Cahuc, Carcillo, Rinne, & Zimmermann, 2013).

Education, as a key success factor in a labour market, has had serious malfunction in the youth cohort; *“...in France 85 per cent of the NEETs have not studied beyond secondary school and 42 per cent have not gone beyond college. This is all the more worrying as the school dropout rates are particularly high and are getting worse. More than 150,000 young people leave the school system each year without any qualifications in this country, or 20 per cent per year group.* (Cahuc, Carcillo, Rinne, & Zimmermann, 2013).

Education schemes, respectively the vocational education and training are vital to ensure the smooth transition from school to work. There are some apprenticeship programs existing also in France; *“the number of young people beginning apprenticeships has doubled over the last 20 years (Cahuc et al., 2013). However, the increase in the number of apprenticeships during the last 10 years is entirely due to relatively qualified young people, i.e., youths who already have an equivalent or better diploma than the secondary school leaving exam”* (Cahuc, Carcillo, Rinne, & Zimmermann, 2013). The problem specifically France deals with is that though there exists some government-driven subsidies to employers to hire apprentices (e.g. social security contributions), small and medium size companies are reluctant to hire apprentices.

French current level of minimum wage, which amounts to 1,616 euros for a full-time position, could represent another substantial barrier for low-skilled job seekers to enter employment successfully. Similarly to the UK, French youngsters on a large scale seem not to be sufficiently qualified to be ‘as productive as the minimum wage requires’ them to be. Subsequently, their chances of gaining employment is limited; *“while other countries allow a reduced minimum wage for young people in comparison to adults, France has not adopted such an approach—apart from certain exceptions. (Cahuc, Carcillo, Rinne, & Zimmermann, 2013).*

This lacking measure worsens the situation of French young job seekers on the labour market. *“France (and Spain) is furthermore an exception amongst European countries by restricting its minimum income scheme to people who are 25 years and older. Almost everywhere in Europe, young people have access to a minimum income scheme before turning 25 years. In France, the fear of additional inactive youths that may result has hindered the consideration that young people under 25 years can enter the minimum income scheme. The consequence is that currently half of the poorest 20 per cent of the French population are between 15 and 29 years old (Cahuc, Carcillo, Rinne, & Zimmermann, 2013)*

The development has not been favourable; and what are the underlying repercussions for the current state? France has relatively high share of high school dropouts; *“...every fifth school leaver does not graduate. In total there are now over 900,000 young adults in France without a high school diploma,” (Cahuc, Carcillo, Rinne, & Zimmermann, 2013).* *“The most fragile young people – in particular, the 130,000 dropouts without qualifications – are not able to gain access to subsidised jobs in the market sector. It would appear that using financial incentives alone is insufficient if the goal is to profoundly modify employers’ hiring and labour management behaviour” (Lefresne, 2012).*

Furthermore, as already initiated, relatively high minimum wage creates a barrier for new labour market entrants to access the jobs – to justify their ‘non-qualification’ in exchange for the ‘government-required’ minimum wage.

In addition, the already troubled youth face quite high labour market segmentation, which is specifically detrimental for young entrants – *“...during the past years, a typical employment and fixed-term contracts have been five times more frequently used for youths than for adults” (Cahuc, Carcillo, Rinne, & Zimmermann, 2013).* *“Although with the increase in age the proportion of part-time or temporary jobs tends to decrease, the deeper structural effects of these long periods of work under sub-standard contracts must be stressed. Each*

generation occupies fewer stable jobs than the previous generation. In other words, the structural effects of today's youth job market give us a preview of what lies ahead" (Lefresne, 2012). Florence Lefresne in his research paper addresses possible way out of this vicious circle. France is going to introduce a measure – contract between an employer and two employees: "...a young person under 30 and a senior over 55. The employer would commit to training the young employee, benefiting from the experience of the senior. The senior would spend part of his/her time (25 or 30 per cent) training, mentoring and guiding the young employee. The senior would teach his/her job to the young person. The measure would be reserved for young graduates, although the precise level has not yet been discussed with the social partners. The goal of this measure is to act as an incentive to employment in industry avoiding the demotion of qualifications for young people who have difficulty finding jobs when they graduate" (Lefresne, 2012).

The projections for France and not well looking, future prospects for French youth are dire; the situation is socially explosive and politicians must act to help the lost generation to avoid long-lasting effects that would inevitably have a major impact on the whole society.

3.3.4 Germany

Situation in Germany is radically different to other European countries (with the exception of Austria, Netherlands and Norway that were barely affected by rising youth unemployment just like Germany). Since 2005 unemployment in Germany began to decline and managed to do so even over the period of the financial crisis. Today the unemployment rate and the youth unemployment rate in Germany are even lower than they were in 2000. What is the reason behind Germany performing exceptionally well in times of crisis and maintaining its youth unemployment at relatively low and acceptable levels for the economic downturn?

“The resilience of Germany’s labour market to the Great Recession is very remarkable and exceptional. Sometimes labelled as a new economic miracle, the country’s success story has received a lot of attention and several studies analyse its underlying mechanisms (mainly export oriented sectors were affected), the concrete policy responses during the critical period (e.g., short-time work), the significant reforms that had improved the functioning of the labour market (- Hartz reforms), and long-term demographic trends that are expected to result in shortages of skilled labour” (Cahuc, Carcillo, Rinne, & Zimmermann, 2013). Germany’s unemployment rate increased radically fast after 2000 and by 2003 had surpassed Britain. But series of Labour reforms called Agenda 2010 were introduced in 2003 by Germans’ chancellor Gerhard Schroeder; among other things these reforms let small business hire more easily and part-time and temporary work were legislatively facilitated as well. From 2005 unemployment began to fall and continued to do so even after the financial crisis. However, not only Agenda 2010 takes all the credit for the situation. Low wage growth as well as export boost helped the country to get where it is now (The Economist, 2013).

Next to Austria and Netherlands, Germany has a dual apprenticeship system. It is a professional system in which the classroom teaching is combined with work experience. And it is the vocational training that represents a key ingredient to smooth the transition from school to work. For instance, *“...about two thirds of the youths completing general schooling each year enter the dual apprenticeship system in Germany; and about one fifth participate in full-time vocational schooling... In addition, the share of apprentices who stay in the same firm after completing their apprenticeship has been about 60 per cent in recent years... Furthermore, the dual apprenticeship system significantly improves wages and employment stability when compared to individuals with schooling only... After about 3 to 4 years, about 80 per cent are employed (of whom 60 to 70 per cent are in stable employment relationships).*

Their wage profile is similar to university students in early years, but flatter in later years (Cahuc, Carcillo, Rinne, & Zimmermann, 2013). The figures demonstrate the vitality of the apprenticeship program and vocational training. After successfully completing such a program, a participant gains not only the experience, but subsequently faster entry into the labour market. *“In Germany a quarter of employers provide formal apprenticeship schemes and nearly two-thirds of schoolchildren undertake apprenticeships. Students in vocational schools spend around three days a week as part-time salaried apprentices of companies for two to four years. The cost is shared by the company and the government, and it is common for apprenticeships to turn into jobs at the end of the training”* (United Nations, 2013). The returns are therefore significant. The apprentice-style approach is also practised in the Netherlands and Austria with similar (positive) results.

It is important to stress out that dual apprenticeship depends on the broad support of employers, trade unions as well as state institutions – for regulation and financing. Especially trade unions play a crucial role – to negotiate with employers conditions of apprenticeships’ contracts (apprentices are paid below the level of standard contracts) in exchange for practical training. *“This is also what one should expect as the German apprenticeship model was developed over decades through close and continuous dialogue with the social partners, aimed at establishing and regularly updating training courses for each type of qualification. Every detail is discussed and negotiated, including the duration of apprenticeships, expectations for the final exam, course content and pay levels”* (Cahuc, Carcillo, Rinne, & Zimmermann, 2013).

In sum, Germany pursues long-time established scheme of apprenticeships and vocational training and it has the lowest youth unemployment rate in Europe. However it would be false to simplify that the former caused the latter (the apprentices and vocational training has existed in Germany for a long time and even such a policy did not prevent the country from reaching over 15% youth unemployment rate in 2005). The problem gets more complex. What helped Germany to lower its unemployment rate was low wage growth and export boost. Hence, vocational training is just one of the policies to be implemented to fight European unemployment.

When trying to position youth unemployment in Europe in a comprehensive context, the demographic trends cannot be overlooked either: over the past ten years, Germany's total fertility rate has been far below other EU countries (The Economist, 2013). It is mainly due to the demographic structure of its society, which looks like a reverse pyramid with many elderly people retiring and leaving positions for new entrants in the job market (see Appendix 1). In fact, this trend puts Germany into advantageous position – the population share of youth is decreasing, which makes labour market entrants not as numerous as other EU counterparts.

We also need to keep in mind that Germany's export-driven economy based on manufacturing works very differently compared to those more service-oriented. Apprenticeship and vocational training approach may be then better suited approach for Germany than other EU countries.

3.4 Conclusion on Youth Unemployment Policies

Although the recession ended in the summer of 2009, youth unemployment remains near its cyclical peak. There have been multiple attempts to find a cure for the youth unemployment soaring rates, however there is not an agreement on how to fight youth unemployment. The Employer's Unions throughout EU demand more flexibility on labour market and lower minimum wages. On the other hand, there are trade unions, which demand more subsidies from public authorities to create jobs for the young and long-time unemployed. (United Nations, 2013)

The European Commission and Council of Ministers proposed forms of legislation that every country should implement under the 'Youth Guarantee' scheme enabling every EU citizen aged 15-24 to claim his or her right for employment, vocational training or apprenticeship programme. Nonetheless, there are many voices claiming this will lead to a disappointment. The roots of the problem with youth unemployment are located in the structural design of national labour markets and education systems. Therefore only structural reforms can help to solve the Europe's youth unemployment 'pain'. Ultimately only structural reforms carried out in each country on individual levels seems to be the only viable solution.

What is needed is a more flexible and less segmented labour market that would encourage companies to hire more employees and give people opportunities – liberalisation of labour rules for permanent workers could narrow the gap between permanent labour force and younger one. (E.g. Spain has already started implementing this policy). 'Disadvantages' youth could be 'advantaged' by cut payroll taxes on youth (implemented by Italy for instance). Lastly, maybe the most underexploited and the most easily achievable mean of reducing youth unemployment could be entrepreneurship; not only it creates new employment, it attracts attention of young people, many of them are interested in managing their own lives...

The only sure-fire remedy for youth unemployment, is a strong and sustainable economic growth; Europe needs to spur its growth to boost the demand so that employers do not have any choice but to hire the young. This is not any easy task though; world's most renowned economists have been attempting this goal for decades.

There is a positive (demographic) outlook though – retirement of the baby boomers across Europe will increase demand for younger workers.

4 Empirical Analysis

The empirical analysis of the factors influencing youth unemployment is conducted on a basis of an econometric model using the regression method. The software selected for the experiment – Gretl¹ – is an open statistical package source; Gretl has been reviewed several times in both – the Journal of Applied Econometrics and the Journal of Statistical Software (J. Wilson Mixon Jr, 2006).

4.1 Data

Dataset was collected mainly from the online accessible databases of economic indicators provided by one of the most trusted statistical organisations – the OECD (Organisation for Economic Cooperation and Development) and the Eurostat (Statistical agency of the EU). The main sources of the supporting data collected were: *Employment and Labour Markets key tables from OECD*, *OECD Economic Outlook 93 database*, *OECD Main Econometric Indicators*, *OECD Main Science and Technology Indicators*, *Eurostat Labour Market online data codes*.

The experiment is based on data collected over a period of 10 years, coming from 2003 to 2012. This data was handled and modified using the basic capabilities of spreadsheet software MS Excel and the econometric software Gretl. Output from the processed data is included in the tables in the document.

The structure of the dataset used for the empirical analysis is panel data organization (stacked time series) with 5 cross-sectional units (selected EU countries) observed over a period of 10 years.

¹ The name is an acronym for Gnu Regression, Econometrics and Time-series Library.

4.1.1 Subject of the Research

The subject of the research and therefore the dependent variable (y) in the thesis is the youth unemployment rate. As stated at the beginning of the thesis, youth unemployment is the lack of job opportunities for the young generation typically aged between 15-24 years old. The youth unemployment rate is then defined as the number of unemployed youth (15-24 years) divided by the youth labour force (employment + unemployment). Youth labour force consists of all the people aged between 15 and 24 who were either employed or unemployed over the reference period (International Labour Office, 2011). The unemployed youth comprises all people between 15 and 24 who, over a specific reference period, were:

- (a) *“Without work; i.e. had not worked for even one hour in any economic activity (paid employment, self-employment, or unpaid work for a family business or farm);*
- (b) *Currently available for work;*
- (c) *Actively seeking work; i.e. had taken active steps to see work during a specified recent period (usually the past four weeks)”* (International Labour Office, 2011).

4.1.2 Subjective Versus Objective Factors

The objective is to determine various different push factors causing youth unemployment. These factors can be generally distinguished into two groups:

- (1) Subjective;
- (2) Objective.

Subjective factors are, from the econometric point of view, difficult to quantify. They are internal and endogenous in nature. The subjective factors include psychological characteristics of human nature; they mainly depend upon personal decisions of particular individuals (motives that restrain from employment could be enjoyment, miscalculation, extravagance etc.). In this particular experiment subjective factors will not be taken into account.

Objective factors are, on the other hand, external to an economic system. The change of these factors is rapid and it brings shifts into the labour market. Objective factors relevant to labour market developments can be an indicator of both social and economic dimensions, such as: government spending, real disposable income etc.

4.1.3 Factors and Predictions

When selecting relevant explaining variables (x) – that may be influencing dependent variable (y) – the Okun’s law² shall not be overlooked. Okun’s law investigates the relationship between unemployment rate and the growth rate of economy. In other words, Okun’s law explains how much of the country’s gross domestic product (GDP) lowered when the unemployment rate was above its natural rate (Investopedia, 2012). Based on Okun’s finding (that has shaped the financial and macroeconomics theories, and are nowadays commonly referred to as ‘law’) society opts for one of the explaining variables to be GDP, respectively the real change in GDP.

Another economic theory relevant to our research is the Phillips curve³. It represents the inverse relationship between the unemployment rate and inflation in an economy. Briefly put, in an economy a lower unemployment rate is correlated with higher inflation – Phillips observed that when unemployment was high, wages increased slowly; whereas when unemployment was low, wages rose rapidly (Hoover, 2013). *“Phillips conjectured that the lower the unemployment rate, the tighter the labour market and, therefore, the faster firms must raise wages to attract scarce labour. At higher rates of unemployment, the pressure abated. Phillips’s “curve” represented the average relationship between unemployment and wage behaviour over the business cycle. It showed the rate of wage inflation that would result if a particular level of unemployment persisted for some time”* (Hoover, 2013). To support the economic theory and Phillips curve, factors of inflation must be included; which will be done through the Index of Consumer Prices (CRI) as one of the variables in the model. Another factor, chosen to be included is the Compensation per Employee (the total gross (pre-tax) wages that are paid by employers to employees) which is correlated with wage behaviour over the business cycle as it was analysed by Phillips.

Accounts taken of globalisation and technological progress, which have an ever-increasing effect on daily lives, were done through involvement of the International Trade Balance and R&D Expenditures of countries’ governments as two other additional factors.

² Arthur Okun (1928-1980) was a Yale professor and economist. His finding has become, in essence, a rule of thumb to explain the relationship between jobs (unemployment) and growth (GDP). (Investopedia, 2012)

³ William Phillips (1914-1975) was a New Zealand economist who spent his academic career at the London School of Economics (LSE). The ‘Phillips curve’ has become his best-known contribution to economics. (Hoover, 2013)

Other objective factors (that appears to be influencing the youth unemployment level) include: Unemployment Rate, Government Debt, Household Saving Rate, and Public Expenditures on Labour Market Policies.

Few other factors that were tested to be potentially included in the experiment were: Price Level Indices, Price of Gold and Future Crude Oil Contracts. At the very beginning of the calculations, these particular variables happened to be highly correlated; also excessive number of variables could cause inaccuracy and unreliability of the econometric analysis, as well as complicated interpretation of the influence of independent variables in the regression. Therefore these three factors were later omitted and will not be considered relevant to this experiment.

4.1.4 Variables Entering the Research

To achieve the objective of the experiment, several economic variables have to be analysed and interpreted. During the analysis, some of the variables may appear to be more relevant and correlated to unemployment than others. To better understand the data, the following table with all variables will give a brief explanation of what the variable represents and what source of data was used:

Table 2: Variables Entering the Research

Variable	Type	Frequency	Description
Youth Unemployment Rate	%	Yearly	The dependent variable that will be predicted. The use of youth unemployment rate instead of unemployment is more relevant because the model uses historical data. Using the rate instead of the actual number is necessary if we want to eliminate the population growth factor. Source: (OECD iLibrary, 2013)
Unemployment Rate	%	Yearly	The Unemployment rate is used as an independent variable to explain the Youth unemployment rate. Also in this case, the rate is used instead of actual number to eliminate the growth of population. Source: (OECD iLibrary, 2013)
Change in Real GDP	%	Yearly	Real Gross Domestic Product (real GDP) is a macroeconomic measure of the value of economic output (all goods and services produces in a given year) adjusted for price changes (expressed in base-year prices) – i.e. inflation (Investopedia, 2013). Source: (OECD iLibrary, 2013)
Government Debt	%	Yearly	General government gross financial liabilities as a percentage of GDP (Government debt) is the total amount of money owed to creditors by government

			(Global Finance, 2013). Source: (OECD, 2013)
Household Saving Rate	%	Yearly	Household saving rate is a percentage of disposable household income. It is defined as the difference between a household's disposable income (wages received, revenue of self-employed, net property income) and its consumption (expenditures on goods and services.) (Eurostat, 2013). Source: (OECD iLibrary, 2013)
Consumer Price Index	Number	Yearly	Consumer Price Index (CPI) is the measure of prices (of consumable goods and services) paid by consumers; and it is used to calculate inflation (European Central Bank, 2013). Source: (OECD. StatExtracts, 2013)
Labour Market Policies	%	Yearly	Public expenditure on active labour market policies as percentage of GDP. Labour market policy (LMP) covers financial and practical support offered to people who are unemployed or otherwise disadvantaged in the labour market. LMP interventions are offered, assisted and paid for by the government (Eurostat, 2013). Source: (OECD iLibrary, 2013)
Compensation per Employee	%	Yearly	Compensation per employee (CE) means the total gross (pre-tax) wages, which are paid by employers to employees for conducted work over a specific accounting period; the total remuneration includes bonuses, overtime payments, employers' social security contributions (European Central Bank, 2013). Source: (OECD iLibrary, 2013)

<p>R&D Expenditures</p> <p>% Yearly</p>	<p>Gross domestic expenditures on R&D (GERD) refer to current and capital expenditures (both public and private) on creative work. R&D covers basic research, applied research, and experimental development (The World Bank, 2013).</p> <p>Source: (OECD iLibrary, 2013)</p>
<p>International Trade Balance</p> <p>Number Yearly</p>	<p>The commercial balance or net exports (NX) is the difference between the monetary value of exports and imports in an economy during a certain period of time (Investopedia, 2013).</p> <p>Source: (OECD. StatExtracts, 2013)</p>

4.1.5 Assumptions Based on Macroeconomic Reality

- Unemployment rate positively influences the youth unemployment rate
- Change in real GDP negatively influences the youth unemployment rate
- Government debt positively influences the youth unemployment rate
- Household saving rate negatively influences the youth unemployment rate
- Consumer price index negatively influences the youth unemployment rate
- Labour market policies negatively influence the youth unemployment rate
- Compensation per employee positively influences the youth unemployment rate
- R&D expenditures negatively influence the youth unemployment rate
- The International trade balance negatively influences the youth unemployment rate

This project aims to study the relationship between the variables stated above, multicollinearity between the independent variables, autocorrelation in the residuals, and heteroscedastisity in the residuals. Thus the objective of the experiment can be reduced to:

Youth Unemployment rate = FN (Unemployment rate, GDP, Government Debt, Household Saving Rate, CPI, Labour Market Policies, Compensation per Employee, R&D Expenditures, International Trade Balance)

4.1.6 Descriptive Statistics

There are 5 cross-sectional units, which represent 5 selected countries of the EU that enter the econometric model. The countries chosen for the experiment are: France, Germany, Poland, Spain and The United Kingdom.

The subsequent tables quantitatively demonstrate the main features of a collection of data. Descriptive statistics of individual variables will help us comprehend variables' specifics, magnitudes, extremes and particularities, in each country.

France

Table 3: Descriptive Statistics on Explanatory Variables in France

		Mean	Standard Deviation	Min	Max
Youth Unemployment Rate	y1	21,5	1,609	18,6	23,8
Constant (Time Vector)	x1	1	0	1	1
Unemployment Rate	x2	9,2	0,649	7,8	10,2
Change in Real GDP	x3	1,0	1,638	-3,1	2,5
Government Debt	x4	84,2	13,082	71,2	109,7
Household Saving Rate	x5	14,8	1,828	11,4	16,8
Consumer Price Index	x6	104,2	4,947	96,2	112,3
Labour Market Policies	x7	1,0	0,083	0,9	1,1
Compensation per Employee	x8	2,7	0,482	1,8	3,4
R&D Expenditures	x9	2,2	0,070	2,1	2,3
International Trade Balance	x10	-5,6	3,042	-10,3	-0,6

France has the third lowest rate of youth unemployment (after Germany and UK) and at the same time the lowest standard deviation for unemployment rate. Standard deviation (which is the square-root of the variance) is a measure of dispersion and describes where any given data is located with respect to the mean. This means that French unemployment rate varies the least from the central tendency.

France has the highest mean for government debt, meaning the central tendency of government debt is highest in France. Also the highest maximum of government debt is in France. It is evident that the highest maximum for household savings is in France, as well as the highest mean for labour market policies with the highest labour market policies' maximum at the same time. What is more, the French expenditures on labour market policies reach over 1% of GDP (which is not found in the other selected countries).

The French economy has also very low standard deviation (second lowest after Poland) for compensation per employee; this means that the gross (pre-tax) wage has not dramatically changed.

Germany

Table 4: Descriptive Statistics on Explanatory Variables in Germany

		Mean	Standard Deviation	Min	Max
Youth Unemployment Rate	y1	11,3	2,110	8,1	15,2
Constant (Time Vector)	x1	1	0	1	1
Unemployment Rate	x2	8,4	1,897	5,5	11,3
Change in Real GDP	x3	1,2	2,508	-5,1	3,7
Government Debt	x4	75,1	8,534	65,6	89,2
Household Saving Rate	x5	10,9	0,415	10,3	11,7
Consumer Price Index	x6	104,6	4,975	96,9	112,6
Labour Market Policies	x7	1,0	0,156	0,7	1,2
Compensation per Employee	x8	1,4	1,030	-0,1	3,0
R&D Expenditures	x9	2,7	0,144	2,5	2,9
International Trade Balance	x10	17,6	2,821	12,2	22,2

The data shows Germany has the lowest mean values of the youth unemployment rate as well as the lowest minimum and standard deviation of this factor. This may lead us to a presumption based on descriptive statistic indicators, which maintain the best – most effectively – it’s the unemployment rate.

Germany’s lowest minimum for changes in real GDP make its economy (at least the measurable output) the strongest among 5 cross-sectional units. In addition to that, Germany happens to be the only country without a negative mean index of international trade balance; both minimum and maximum of this factor are the highest too.

Together with France, Germany has the highest central tendency (mean) for labour market policies with even a higher maximum. Also the R&D expenditures stand out of the data sample with highest mean and maximum.

Poland

Table 5: Descriptive Statistics on Explanatory Variables in Poland

		Mean	Standard Deviation	Min	Max
Youth Unemployment Rate	y1	28,5	8,186	17,3	41,3
Constant (Time Vector)	x1	1	0	1	1
Unemployment Rate	x2	12,5	4,542	7,1	19,8
Change in Real GDP	x3	4,3	1,592	1,6	6,8
Government Debt	x4	57,2	3,867	51,7	63,1
Household Saving Rate	x5	4,6	3,254	-0,3	7,7
Consumer Price Index	x6	107,7	9,377	94,7	124,2
Labour Market Policies	x7	0,5	0,117	0,4	0,7
Compensation per Employee	x8	3,9	2,184	1,7	8,9
R&D Expenditures	x9	0,6	0,090	0,5	0,8
International Trade Balance	x10	-1,5	0,631	-3,2	-1,0

According to the data, Poland along with Spain has the worst results in the youth unemployment rate (Spain the absolute worst). The mean and minimum value of this factor is the second lowest within the sample. Due to this, Poland has the highest standard deviation for the unemployment rate.

The economy of Poland experiences the biggest mean of change in real GDP with its highest maximum; other countries do not go over 1.4%, whereas Poland reaches the central tendency of 4.3% - this implies steep growth of Poland's economy, respectively its GDP. Also, it is the only country that maintains a minimum of a GDP change in positive numbers.

On the other side, there appears to be instability in the Polish economy judging by its highest standard deviation of the household saving rate – biggest variety in sample. Poland also has the lowest mean for the household saving rate and is the only country with a negative minimum of this factor.

Compensation per employee as per cent of GDP have the highest average and highest maximum – Polish employers pay the most in total remuneration for their employees.

Gross domestic expenditures on R&D have the lowest mean in Poland; it is the only country where this index does not even reach 1% of GDP for R&D expenses.

Spain

Table 6: Descriptive Statistics on Explanatory Variables in Spain

		Mean	Standard Deviation	Min	Max
Youth Unemployment Rate	y1	29,3	11,920	17,9	53,2
Constant (Time Vector)	x1	1	0	1	1
Unemployment Rate	x2	14,5	5,846	8,3	25,0
Change in Real GDP	x3	1,4	2,447	-3,7	4,1
Government Debt	x4	59,4	14,464	42,4	90,5
Household Saving Rate	x5	11,5	1,574	8,2	14,1
Consumer Price Index	x6	106,9	7,835	93,9	118,8
Labour Market Policies	x7	0,8	0,070	0,7	0,9
Compensation per Employee	x8	2,7	2,107	-0,5	6,7
R&D Expenditures	x9	1,3	0,127	1,1	1,4
International Trade Balance	x10	-7,2	2,675	-11,5	-3,4

Spain has the highest means for both – the youth unemployment rate and unemployment rate. In terms of unemployment rate, Spain experienced the highest maximum as well as the biggest standard deviation; the data in a set therefore varies very much from the central tendency and the labour market developments have been quite unstable in recent years.

In the case of Spain, the government debt has the second highest standard deviation; but the mean and the maximum for this factor are the second lowest.

Spain has the lowest minimum for consumer price index. However the mean value for CPI is the third highest (after the UK and Poland); this may signify that Spanish consumers pay more for goods and services than French or German consumers.

The mean index of the international trade balance concludes that Spain is the second worst (after UK) and has a negative value. The minimum of the same factor is the fourth worst out of the 5-cross sectional units' sample.

The United Kingdom

Table 7: Descriptive Statistics on Explanatory Variables in the UK

		Mean	Standard Deviation	Min	Max
Youth Unemployment Rate	y1	15,9	3,286	11,8	21,0
Constant (Time Vector)	x1	1	0	1	1
Unemployment Rate	x2	6,2	1,346	4,7	8,0
Change in Real GDP	x3	1,4	2,315	-4,0	3,9
Government Debt	x4	64,4	23,087	41,6	103,9
Household Saving Rate	x5	4,6	1,545	2,0	7,1
Consumer Price Index	x6	107,8	8,629	96,7	123,0
Labour Market Policies	x7	0,4	0,064	0,3	0,5
Compensation per Employee	x8	3,3	1,212	1,5	5,1
R&D Expenditures	x9	1,8	0,040	1,7	1,8
International Trade Balance	x10	-11,5	2,852	-15,3	-6,4

The United Kingdom is the country with lowest mean and the lowest minimum of unemployment rate (lower than Germany) from the selected countries in this experiment. The lowest minimum index of unemployment rate UK reaches is rather extraordinary since the labour market goes through times of deep economic crises.

The highest standard deviation for government debt is found in the UK, meaning that the government debt has varied from central tendency over the observed years the most.

The UK (together with Poland) experiences the highest mean for consumer price index; this indicates that the UK has experienced the highest inflation; there is the highest standard deviation for the factor, too – the consumer prices have experienced the most changes.

The International trade balance in the UK has the worst results. All three indices have negative values. The UK's balance of trade has the lowest mean, the lowest minimum and the lowest maximum. This presumes very low orientation of the UK's economy on exports, respectively high imports into the country.

4.1.7 Trends on Variables

The data explored in the previous chapter of ‘Descriptive Statistics’ shows great divergences in economic growth between the chosen countries. Therefore this chapter will explore recent data (see Original dataset), detecting causalities and covering the trends of particular variables.

Youth Unemployment Rate (%)

Youth unemployment has been dramatically soaring in Europe over the latest decade. If we look at the sample data more closely (see Original Dataset; Source: (OECD iLibrary, 2013)), the largest issues with the youth unemployment rate shoot-ups are spotted to be in Spain (from 22.6% in 2003 to 53,2% in 2012) and the United Kingdom (from 11.8% in 2003 to 21% in 2012). France has experienced an increase over the decade as well (moderate 3.2% since 2003). On the other hand we can see Germany and Poland successfully decreasing the rates of their youth unemployment. Germany decreased its youth unemployment rate from 12.1% in 2003 to 8.1% in 2012. Poland experienced the biggest drop, when they managed to reduce the youth unemployment rate 14.5% (from 41.3 in 2003 to 26.5 in 2012).

In average the youth unemployment rate for the year of 2012 is at 26.5% which describes a dramatic trend of continued increase of this factor in today’s Europe.

Unemployment Rate (%)

The unemployment rate (much like youth unemployment rate) represents continued European concern over the past 10 years (see Original Dataset; Source: (OECD iLibrary, 2013)). Germany and Poland are the only countries from our sample that have managed to decrease their rates. Germany pushed its unemployment from 9.8% in 2003 to 5.5% in 2012 and therefore happens to be a country the with lowest unemployment rate in Europe. Poland (similarly to Germany) decreased its unemployment by roughly half – from 19.8% in 2003 to 10.15% in 2012. On the other side, France, Spain and the UK did not manage to stop deepening their unemployment rates and therefore stabilize the situation on labour markets.

The average unemployment rate over the observed decade is 10.2%. The current situation has worsened and the average for 2012 rose to 11.7% for all 5 cross-sectional units.

Change in Real GDP (%)

Judging from the Original Dataset sample (Source: (OECD iLibrary, 2013)), EU countries have 'smaller' economies than precedent years: France, Germany and UK are barely growing (0% growth in 2012 for France, 0,7% in Germany, and 0.2% growth for 2012 in UK). The temporary boost Britain got from the Olympic Games did not prove to have long-term effects and the growth from 2010 (1.8%) dropped by 1.6% over the past two years. The country with a better outlook for the economy growth is Poland with 1.9% change in real GDP. Although in the long run, the economy is contracting. Significant contractions are in Spain, with a negative 1.4% growth in 2012; regarding its political turmoil, the outlook for the near future is not positive either.

European growth (understand the growth of five selected EU countries) dropped by 2% in average from 2003 to only 0.3% in 2012; the indicated trend of (even global) slowdown is likely to continue. Mature economies are still healing the scars of the 2008-2009 crises.

Government Debt (% of GDP)

Government debt appears to be one of the most significant factors indicating the on-going political turmoil in Europe. Most recently the debt crisis has spread to Spain, where the economy has further weakened, however the government debt situation is unfavourable in all sample countries. For detailed understanding, the Original Dataset was closely observed (Source: (OECD, 2013)):

France increased its debt obligation by nearly 30% - from 71.7% in 2003 to staggering 109.7% in 2012 (the index stands for financial liabilities as a percentage of GDP country has towards its creditors). Germany increased its debt by about 15% - from 65.9% in 2003 to 89.2% in 2012. The Polish government debt happens to be the lowest (by relative measures) with 'only' 62.6% of its GDP. In Spain, one of the markets hit hardest by Europe's debt crisis, the growth of government debt went from 55.3% in 2003 to 90.5% in 2012. Unambiguously, the most dramatic increase of the country's financial liabilities, by staggering 62.3% over 10 years, was executed in UK; the 2012 index for UK's government debt stands at 103.9% of its GDP.

In average, for all five countries, the debt increased from 58% in 2003 to 91.2% in 2012. Implications are, that debt crisis continues and remains a key down side risk to the global economy. In result, this can expect the economies to contract.

Household Saving Rate (% of Disposable Household Income)

The household saving rate stays relatively stable in Germany (10.9% in average; 10.6% in 2012). In other countries, the magnitudes widen as data shows (see Original Dataset; Source: (OECD iLibrary, 2013)). In France household saving rate rose by 3.5% to 16.1% in 2012; Poland experiences a decline from 7.6% in 2003 to -0.2% in 2012; Spain decreased its saving rate as well, from 12% in 2003 to 8.2% in 2012; UK saving rate grew from 5.1% in 2003 to 7.1% in 2012. The decade average is at 9.3%; 2012 average then decreased to 8.4%.

Overall, the household saving rate increased in France, UK and moderately in Germany; but declined in other – Spain, in some cases sharply – Poland. With the great recession of 2007-2008 the trend of household savings reversed itself, and the factor increased in 2009 in UK and Poland. However, in 2010 the rate started declining once again in Poland and Spain.

Consumer Price Index (2005 = 100)

Consumer price index (CPI) /consumer price inflation (CPI) rose gradually in all selected countries from the sample (see Original Dataset; Source: (OECD. StatExtracts, 2013). The current level (understand for the year 2012) of CPI stands at 12.3% for France, 12.6% for Germany, 124.2% for Poland, 118.8% for Spain and 123% for UK.

To sum up, Euro zone inflation accelerated, annual consumer-price growth quickened, the average over the decade 106.2%, started in 2003 at average of 95.7% and moved up to 118.2% as average in 2012; the consumer price inflation increased by staggering 22.5% over the past ten years.

Labour Market Policies (% of GDP)

Public expenditures on active labour market policies (see Original Dataset; Source: (OECD iLibrary, 2013) oscillated at constant levels in all 5 sectional units from our sample. France labour market policies represented in 2012 1% of GDP; Germany for both 2011 and 2012 stayed at 0.9%; Poland likewise, the index is the same for 2011 and 2012 at the level of 0.7%; Spain managed to keep its labour market policies at a constant level for the past three observed years, i.e. 0.9% in 2010, 2011 and 2012; the UK's level matches 0.4% of its GDP for 2011 and 2012. The average level of labour market policies expenditures for all countries oscillates at 0.7% over the observed time (2003-2012).

Compensation per Employee (% Change from Previous Period)

Compensation per employee (CE) – including the total gross (pre-tax) wages, which are paid by employers to employees for conducted work over a specific accounting period – underwent the most significant decline after the great recession hit Europe in 2007-2008. In recent years, however, the trend reversed itself and CE rose slowly and gradually.

In France, CE started at 2.8% (change from previous period), experienced its minimum in 2009 at 1.8% and went back to 2.1% in 2012. Germany's value was at 1.2% in 2003, dropped to 0.7% in 2008 and increased to 0.9 in 2012. Poland along with Spain did not experience the decline around 2008/2009 rising gradually to 0.7% in 2012 in Poland and 0.9% in 2012 in Spain. UK's minimum (in reaction to recession's times) decreased to 0.3% in 2008, 2009 and in 2010, the current level – in 2012 – is at 0.4%. Average for all countries was at 0.7%.

R&D Expenditures (% of GDP)

Gross domestic expenditures on R&D (GERD) as a percentage of GDP is a key indicator to measure the innovative strength one economy possess. The long term trend of GERD appears not to be influenced by the global recession or economies slowdowns and continue to rise gradually over the observed period of time (see Original Dataset; Source: (OECD iLibrary, 2013)). France R&D in 2012 represented 2.27% of country's GDP; even higher index belongs to Germany, where 2012's GERD reached to 2.85%. The lowest R&D investments are in Poland, in 2012 it was 0.78%; Spain's GERD rose to 1.35% in 2012; the UK has the third highest volume into R&D with amount reaching 1.78% of country's GDP.

On average in a decade, a country invested in development and innovation in the EU 1.7% of a country's GDP. The trend for Europe has a positive outlook under the condition that the EU countries keep increasing their investments into development and research to gain competitiveness in relation to the rest of the world.

International Trade Balance (billions of US dollars)

The international trade balance of a selected number of EU countries (see Original Dataset; Source: (OECD. StatExtracts, 2013)) is falling. Four out of five cross-sectional units get negative results not only in the latest year but over the whole observed time period. The only country, greatly standing out of the sample, which managed not only to keep its positive balance of trade, but to even increase it (growth of net export) is Germany. Germany raised its volumes of net exports by a staggering 7.77 billion of US\$, from 12.23b US\$ to 20.00b US\$. France's trade balance has been going deeper to negative numbers since the first observed period (-0.57b US\$) with the absolute minimum in 2011 of -10.29b US\$, in 2012 the balance adjusted to -9.74b US\$. Poland improved its international trade balance over observed year from -1.21b US\$ in 2003 to -1.06b US\$. Likewise Poland, Spain slightly improved its results from 2003 (-4.37b US\$) to -3.41b US\$ in 2012. Unlike Poland and Spain, UK continues in decline of its balance of trade; net exports worsened from -6.38b US\$ in 2003 to -14.6b US\$ in 2012; this represents a drop by more than 8b (8.22b) US\$ over the observed period of years.

In general, the trend of international trade is rather unfavourable (apart from Germany, which stands out not only by its excellent net exports' volumes, but also by the gradually growing trend of the factor). In average, business sector's international trade in all countries from the sample has dropped from -0.1b US\$ in 2003 (already negative!) to -1.6b US\$ in 2012.

4.2 Model

4.2.1 Methodology – OLS

The empirical analysis is based on a one-equation least squares regression model. The regression method used for estimating unknown parameters in a least squares regression model is the *Ordinary Least Squares*⁴ (referred to as OLS). This method minimizes the sum of squared vertical distances between the responses observed in the set of data and the responses predicted by the linear approximation (Hutcheson, 2011).

In order to make the OLS method applicable, the multiple linear regression models follow these assumptions:

- Correct specification (the linear functional form is correctly specified),
- Explained dependent variable is metric,
- No multicollinearity,
- No outliers (extreme values),
- Linear relationship of variables,
- Normality (variables have normal distribution),
- Strict exogeneity (the errors in the regression should have conditional mean zero)
- Relationship among variables shows homoscedasticity (variance of variables is more or less same).

In mathematical description is optimality reached if:

$$\begin{aligned} \{a_{i,j}\} &\text{ are not random variables,} \\ E(e_i) &= 0, \text{ for all } i, \\ \text{Var}(e_i) &= \sigma, \text{ for all } i, \\ \text{Cov}(e_i, e_j) &= 0, \text{ for all } i \text{ and } j, \end{aligned}$$

Then $\hat{\mathbf{x}} = \arg \min_{\mathbf{x}} \sum e_i^2$ is the best unbiased linear estimator.

⁴ OLS was invented by Carl Friedrich Gauss in about 1795, rediscovered in 1805 by Adrien-Marie Legendre, making it one of the earliest prediction methods known to humankind (Unsolved Mysteries of Science, 2009).

4.2.2 Definition of Variables, Coefficients and Residual

Endogenous Variable

- $y_{1t} =$ Youth Unemployment Rate (%)

Exogenous Variables

- $x_{1t} =$ Constant, Invariable (Unit Vector)
- $x_{2t} =$ Unemployment Rate (%)
- $x_{3t} =$ Change in Real GDP (%)
- $x_{4t} =$ Government Debt (% of GDP)
- $x_{5t} =$ Household Saving Rate (% of Disposable Household Income)
- $x_{6t} =$ Consumer Price Index (2005 = 100)
- $x_{7t} =$ Labour Market Policies (% of GDP)
- $x_{8t} =$ Compensation per Employee (% Change from Previous Period)
- $x_{9t} =$ R&D Expenditures (% of GDP)
- $x_{10t} =$ International Trade Balance (billions of US dollars)

Coefficients

- $\beta_2 =$ Unemployment Rate Coefficient
- $\beta_3 =$ Change in Real GDP Coefficient
- $\beta_4 =$ Government Debt Coefficient
- $\beta_5 =$ Household Saving Rate Coefficient
- $\beta_6 =$ Consumer Price Index Coefficient
- $\beta_7 =$ Labour Market Policies Coefficient
- $\beta_8 =$ Compensation per Employee Coefficient
- $\beta_9 =$ R&D Expenditures Coefficient
- $\beta_{10} =$ International Trade Balance Coefficient

Residual

- $u_{1t} =$ Error or Residual

4.2.3 Original Dataset

Table 8: The Main Explanatory Factors of Youth Unemployment

	Year	y1	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10
France	2003	20,6	1	8,9	0,9	71,7	12,6	96,2	1,1	2,8	2,18	-0,57
	2004	21	1	9,3	2,5	74,1	12,4	98,3	1,1	3,4	2,16	-1,57
	2005	21,9	1	9,3	1,8	76,0	11,4	100,0	1	3,1	2,11	-3,39
	2006	21,6	1	9,2	2,5	71,2	14,8	101,7	0,9	3,2	2,11	-3,84
	2007	19,1	1	8,4	2,3	73,0	15,4	103,2	0,9	2,5	2,08	-5,93
	2008	18,6	1	7,8	-0,1	79,3	15,6	106,1	0,9	2,6	2,12	-8,33
	2009	23,2	1	9,5	-3,1	91,3	16,5	106,2	0,9	1,8	2,27	-6,49
	2010	22,9	1	9,7	1,7	95,6	16,1	107,8	1	2,3	2,24	-7,27
	2011	22,1	1	9,6	1,7	99,5	16,8	110,1	1,1	3,0	2,25	-10,29
	2012	23,8	1	10,2	0	109,7	16,1	112,3	1	2,1	2,27	-8,74
	2003	12,1	1	9,8	-0,4	65,9	10,3	96,9	1,2	1,4	2,54	12,23
	2004	12,6	1	10,5	1,2	69,3	10,4	98,5	1,2	0,3	2,5	16,16
2005	15,2	1	11,3	0,7	71,8	10,5	100,0	1,1	-0,1	2,51	16,14	
2006	13,6	1	10,3	3,7	69,8	10,8	101,6	0,9	1,0	2,54	16,78	
2007	11,7	1	8,7	3,3	65,6	11,0	103,9	0,9	0,8	2,53	22,16	
2008	10,4	1	7,5	1,1	69,9	11,7	106,6	0,7	2,1	2,69	21,63	
2009	11	1	7,8	-5,1	77,5	11,1	107,0	0,8	0,2	2,82	16,08	
2010	9,7	1	7,1	3,7	86,1	11,3	108,2	1	2,4	2,8	16,99	
2011	8,5	1	5,9	3,0	86,3	11,0	110,4	0,9	3,0	2,84	18,24	
2012	8,1	1	5,5	0,7	89,2	10,6	112,6	0,9	2,5	2,85	20,00	
Poland	2003	41,3	1	19,8	3,9	55,3	7,6	94,7	0,4	1,7	0,54	-1,21
	2004	40,8	1	19,1	5,3	54,7	7,7	97,9	0,4	1,8	0,56	-1,22
	2005	37,8	1	17,9	3,6	54,8	7,4	100,0	0,4	1,7	0,57	-1,02
	2006	29,8	1	13,9	6,2	55,2	6,1	101,3	0,4	2,0	0,56	-1,35
	2007	21,7	1	9,6	6,8	51,7	4,6	103,8	0,5	4,8	0,57	-2,12
	2008	17,3	1	7,1	5,1	54,4	-0,3	108,1	0,5	8,9	0,6	-3,17
	2009	20,7	1	8,1	1,6	58,4	6,8	112,2	0,6	3,5	0,67	-1,07
	2010	23,7	1	9,7	3,9	62,4	6,1	115,1	0,6	4,6	0,74	-1,52
	2011	25,8	1	9,7	4,3	63,1	-0,2	120,0	0,7	3,9	0,77	-1,68
	2012	26,5	1	10,1	1,9	62,6	-0,2	124,2	0,7	5,8	0,78	-1,06
	2003	22,6	1	11,4	3,1	55,3	12,0	93,9	0,7	2,6	1,05	-4,37
	2004	21,2	1	11	3,3	53,3	11,3	96,7	0,7	2,1	1,06	-6,30
2005	19,7	1	9,2	3,6	50,8	11,3	100,0	0,8	2,8	1,12	-8,00	
2006	17,9	1	8,6	4,1	46,3	11,2	103,5	0,8	3,2	1,2	-9,58	
2007	18,2	1	8,3	3,5	42,4	10,2	106,4	0,8	4,6	1,27	-11,32	
2008	24,6	1	11,4	0,9	47,8	12,1	110,7	0,8	6,7	1,35	-11,54	
2009	37,9	1	18,1	-3,7	62,9	14,1	110,4	0,8	4,4	1,39	-5,47	
2010	31,6	1	20,2	-0,1	67,8	13,6	112,4	0,9	0,2	1,39	-6,04	
2011	46,4	1	21,8	0,7	77,1	11,0	116,0	0,9	0,5	1,33	-5,83	
2012	53,2	1	25	-1,4	90,5	8,2	118,8	0,9	-0,5	1,35	-3,41	
2003	11,8	1	5	3,9	41,6	5,1	96,7	0,4	4,7	1,75	-6,38	
2004	12,6	1	4,7	2,9	43,9	4,0	98,0	0,4	3,8	1,69	-9,27	
2005	13,5	1	4,8	2,8	46,1	5,1	100,0	0,5	3,8	1,72	-8,97	
2006	13,8	1	5,4	2,6	45,9	4,2	102,3	0,4	4,7	1,74	-9,04	
2007	14,2	1	5,3	3,6	47,0	2,2	104,7	0,3	5,1	1,77	-15,27	
2008	14,1	1	5,6	-1,0	57,5	2,0	108,5	0,3	1,5	1,78	-14,28	
2009	19	1	7,6	-4,0	72,0	5,1	110,8	0,3	2,8	1,84	-10,86	
2010	19,3	1	7,8	1,8	85,6	5,1	114,5	0,3	2,7	1,8	-12,80	
2011	20	1	8	0,8	100,4	6,5	119,6	0,4	2,1	1,77	-13,51	
2012	21	1	7,9	0,2	103,9	7,1	123,0	0,4	2,0	1,78	-14,60	
Average		21,3	1,0	10,2	1,8	68,1	9,3	106,2	0,7	2,8	1,7	-1,6

4.2.4 Economic and Econometric Model

Economic model:

The economic model is based on assumptions coming from the labour market's developments and macroeconomic reality (as described in the previous chapter). The economic equation shows the relationship between chosen variables to be as followed:

Econometric model:

In addition to what is already subjected to the economic model, the econometric model contains error (u_{1t}). The regression equation follows as:

$$y_{1t} = \beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{3t} + \beta_4 x_{4t} + \beta_5 x_{5t} + \beta_6 x_{6t} + \beta_7 x_{7t} + \beta_8 x_{8t} + \beta_9 x_{9t} + \beta_{10} x_{10t} + u_{1t}$$

4.2.5 Multicollinearity

In order to attain high accuracy of the model, the identification of multicollinearity in the model is conducted through formation of a Correlation matrix.

Multicollinearity exists when two or more of the independent variables used in the regression are moderately or highly correlated. The Correlation matrix provides the significant correlation coefficient between pairs of independent variables in the model. (Mishra, 2012)

The identification rule for multicollinearity implies, that correlation coefficient between pairs of independent variables does not overreach an index of 0.8. The determinant of correlation matrix shall not be very close to zero, too; in case of a non-existent multicollinearity determinant is equal to 1 and correlation matrix is a unit matrix.

Table 9: The Correlation Matrix

	y1	x2	x3	x4	x5	x6	x7	x8	x9	x10
y1	1									
x2	0,9135	1								
x3	-0,0386	-0,0843	1							
x4	0,0429	0,0540	-0,4625	1						
x5	0,0388	0,1831	-0,3268	0,4549	1					
x6	0,1957	0,0722	-0,3086	0,4919	-0,2080	1				
x7	-0,0832	0,1170	-0,2361	0,4038	0,7192	-0,0945	1			
x8	-0,1850	-0,4134	0,3637	-0,4275	-0,4093	0,0840	-0,3198	1		
x9	-0,5967	-0,4144	-0,4504	0,5350	0,4909	-0,0575	0,5425	-0,3732	1	
x10	-0,3332	-0,0279	0,0060	0,1317	0,1668	-0,1644	0,4559	-0,3624	0,4905	1

A strong multicollinearity (0.9135) was identified between variables y_{1t} and x_{2t} . But since y_{1t} is our dependent (explained) variable, the correlation between these two variables (y_{1t} and x_{2t}) is favourable.

No other multicollinearity between explanatory variables has been determined therefore no elimination of variables or extreme values (outliers) is needed.

4.3 Results

4.3.1 Parameters' Estimation Using OLS in SW Gretl

The number of fields used in Gretl was thirteen and regression models were nine. Some factors proved to be weak as they were highly correlated, which resulted in redundancy of findings (multicollinearity) – as explained in detail in a chapter above. For having the best accuracy, redundant variables were cut off and once the dataset was trimmed (see 4.2.3 Original Dataset), data processing began. In result, there are 10 predictors that are possibly related to the youth unemployment rate.

The formula used for the estimation of parameter via OLS method is: $(Y) = (X^T X)^{-1} X^T y$

Table 10: Pooled OLS,

Using 50 observations, Included 5 cross-sectional units, Time-series length = 10,

Dependent variable: y1

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	4.2336	7.00247	0.6046	0.54887	
x2	1.87417	0.126383	14.8293	<0.00001	***
x3	-0.104272	0.18072	-0.5770	0.56719	
x4	0.117043	0.0345477	3.3879	0.00159	***
x5	-0.113808	0.130905	-0.8694	0.38982	
x6	-0.0566351	0.0690356	-0.8204	0.41686	
x7	-0.661227	2.05257	-0.3221	0.74902	
x8	0.639465	0.286912	2.2288	0.03151	**
x9	-2.51235	1.11194	-2.2594	0.02937	**
x10	-0.18012	0.0439358	-4.0996	0.00020	***
Mean dependent var	21.31400	S.D. dependent var		9.823961	
Sum squared resid	195.1641	S.E. of regression		2.208869	
R-squared	0.958730	Adjusted R-squared		0.949445	
F (9, 40)	103.2484	P-value(F)		7.95e-25	
rho	0.267497	Durbin-Watson		1.328467	

4.3.2 Interpretation of the Results

To indicate the importance of each coefficient, a selection was featured (asterisk sign, pooled OLS estimation of parameters); some of the factors were suggested to be rather important while others were marginally important and the rest was least important.

(a) Important fields:

- Unemployment rate (x_2)
- Government debt (x_4)
- International Trade Balance (x_{10})

(b) Marginal important fields:

- Compensation per Employee (x_8)
- R&D Expenditures (x_9)

(c) Relatively important fields:

- Change in Real GDP (x_3)
- Household Saving Rate (x_5)
- Consumer Price Index (x_6)
- Labour Market Policies (x_7)

The *Coefficient of Determination* – R-squared – is 0.958730. This gives us a clue that the form of the regression model used for this experiment may explain the dependent variable y (youth unemployment rate) in likelihood 95%. In other words, 95% of the variations in the youth unemployment rate can be explained by the Unemployment rate, GDP, Government debt, Household savings, CPI, Labour market policies, Compensations per employee, R&D and Balance of trade.

The output from the parameter's estimation using OLS in Gretl provides the values of coefficients. Hence, the final form of our regression model can be transformed as follows:

$$y_{1t} = 4.2336 x_{1t} + 1.87417 x_{2t} - 0.104272 x_{3t} + 0.117043 x_{4t} - 0.113808 x_{5t} - 0.0566351 x_{6t} \\ - 0.661227 x_{7t} + 0.639465 x_{8t} - 2.51235 x_{9t} - 0.18012 x_{10t} + u_{1t}$$

The relationship between variables, in particular the values of coefficients now help us explain the dependent variable (y) generated in the model.

Interpretation of the results is *ceteris paribus*:

- ✓ Supposing the parameters' values of other variables are zero, the youth unemployment rate will be 4.3%.
- ✓ If the unemployment rate rises by 1%, the youth unemployment rate will increase by 1.87%.
- ✓ If the real GDP grows by 1%, the youth unemployment rate will decrease by 0.1%.
- ✓ If government debt grows by 1%, the youth unemployment rate will increase by 0.12%.
- ✓ If the household saving rate rises by 1%, the youth unemployment rate will decrease by 0.11%.
- ✓ If the consumer price index rises by unit, the youth unemployment rate will decrease by 0.06%.
- ✓ If public expenditures on labour market policies grow by 1%, the youth unemployment rate will decrease by 0.66%.
- ✓ If compensation per employee grows by 1%, the youth unemployment rate will increase by 0.64%.
- ✓ If R&D expenditures grow by 1%, the youth unemployment rate will decrease by 2.5%.
- ✓ If the balance of trade increases by 1 billion \$, the youth unemployment rate will decrease by 0.18%.

4.3.3 Economic Verification

In the following chapter, the results will be compared with the assumptions based on macroeconomics reality we had made before obtaining the results via OLS in Gretl.

Table 11: Verification of Economic Assumptions

Coefficient	Assumption	Fulfilment
4.2336	---	---
1.87417	The unemployment rate positively influences youth unemployment rate. If unemployment rate rises, the youth unemployment rate will increase.	YES
-0.104272	Change in real GDP negatively influences the youth unemployment rate. If real GDP rises, the youth unemployment will decrease.	YES
0.117043	Government debt positively influences youth unemployment rate. If government debt grows, the youth unemployment will increase.	YES
-0.113808	Household saving rate negatively influences youth unemployment rate. If household saving rate rises, the youth unemployment will decrease.	YES
-0.0566351	Consumer price index negatively influences youth unemployment rate. If consumer price index rises, the youth unemployment will decrease.	YES
-0.661227	Labour market policies negatively influences youth unemployment rate. If public expenditures on labour market policies grow, the youth unemployment will decrease.	YES
0.639465	Compensation per employee positively influences youth unemployment rate. If compensation per employee grows, the youth unemployment will increase.	YES
-2.51235	R&D expenditures negatively influences youth unemployment rate. If R&D expenditures grow, the youth unemployment rate will decrease.	YES
-0.18012	International Trade Balance negatively influences youth unemployment rate. If net exports rise, the youth unemployment rate will decrease.	YES

4.3.4 Statistical Verification

Verification of statistical significance of parameters was conducted in two steps:

- (1) Statistical verification of whole model;
- (2) Verification of statistical significance of parameters.

(1) Statistical verification of whole model

The *Coefficient of Determination* denoted R^2 , (squared coefficient of correlation, R) is used to determine the influence of theoretic variance to real variance. To simply state, the Coefficient of determination indicates ‘the goodness of a fit’ of a regression. We use it as a measure for accuracy of the linear regression – the accuracy of the predictor of the independent variable on the dependent variable value.

The formula used for computing the Coefficient of determination is as follows:

$$R^2 = 1 - (Su^2 / Sy^2); <0;1>$$

An Excel spread-sheet document was used to calculate the residual variance, adjusted residual variance and total variance:

Number of observations:	50
Degrees of freedom:	40
Total variance Sy^2 :	211.624796
Residual variance, Su^2 :	3.903283
Adjusted residual variance, $Su^2_{adjusted}$:	4.879103
Coefficient of determination, R^2 :	0.958730
Adjusted coefficient of determination, $R^2_{adjusted}$:	0.949445

The Coefficient of Determination – R-squared – came up to 0.958730. The index implies that the dependent variable y_1 (Youth Unemployment Rate) is influenced by selected regression in likelihood 95%. In other words, 95% of the variations in the youth unemployment rate can be explained by Unemployment rate, GDP, Government debt, Household savings, CPI, Labour market policies, Compensations per employee, R&D and Balance of trade.

(2) Verification of statistical significance of parameters.

For the statistical significance testing, two methods were executed:

- (a) P-value; and
- (b) T-value.

P-value

P-value stands for "the probability, if the test statistic really were distributed as it would be under the null hypothesis, of observing a test statistic (as extreme as, or more extreme than) the one actually observed. A *p*-value of 0.05 or less rejects the null hypothesis 'at the 5% level' that is, the statistical assumptions used imply that only 5% of the time would the supposed statistical process produce a finding this extreme if the null hypothesis were true." (Economics, 2013). Simply stated, the smaller the *p*-value is, the more strongly the null hypothesis is rejected.

P-value's indices were computed in SW Gretl using the OLS regression method:

Table 12: *P-value Test for Statistical Significance*

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	4.2336	7.00247	0.6046	0.54887	
x2	1.87417	0.126383	14.8293	<0.00001	***
x3	-0.104272	0.18072	-0.5770	0.56719	
x4	0.117043	0.0345477	3.3879	0.00159	***
x5	-0.113808	0.130905	-0.8694	0.38982	
x6	-0.0566351	0.0690356	-0.8204	0.41686	
x7	-0.661227	2.05257	-0.3221	0.74902	
x8	0.639465	0.286912	2.2288	0.03151	**
x9	-2.51235	1.11194	-2.2594	0.02937	**
x10	-0.18012	0.0439358	-4.0996	0.00020	***
Mean dependent var	21.31400		S.D. dependent var	9.823961	
Sum squared resid	195.1641		S.E. of regression	2.208869	
R-squared	0.958730		Adjusted R-squared	0.949445	
F (9, 40)	103.2484		P-value(F)	7.95e-25	
rho	0.267497		Durbin-Watson	1.328467	

Asterisks in the far right column of the table helps to determine where the p-value is to be found 0.05 or less, so that the null hypothesis can be rejected. Thus, variables x2, x4, x8, x9, and x10 have p-value small enough to reject the hypothesis according to which the coefficient of variables is equal to 0 – the null hypothesis. Alternatively, variables (their p-values) are significantly different from zero. The parameters x2 (Unemployment Rate), x4 (Government Debt), x8 (Compensations per Employee), x9 (Gross Domestic Expenditures on R&D), x10 (International Trade Balance) are therefore considered statistically significant.

T-value / T-test

Another statistical hypothesis test used is the t-value or the t-test. The t-test assesses whether the means of the two groups are statistically different from each other. The table below (Test of Statistical Significance) summarizes the calculations' results carried out in the Excel spread-sheet that was carried out to get the t-value's indices.

Table 13: Test of Statistical Significance

Variable	Parameter	Matrix	S _{ii}	S _{bi}	t-value	t-tab. $\alpha=0.05$	S / N *
x1	4.2336	10,049923	49,03461	7,002472	0,6046	2,2010	N
x2	1.87417	0,003274	0,01597	0,126383	14,8293	2,2010	S
x3	-0.104272	0,006694	0,03266	0,180720	-0,5770	2,2010	N
x4	0.117043	0,000245	0,00119	0,034548	3,3879	2,2010	S
x5	-0.113808	0,0035121	0,01714	0,130905	-0,8694	2,2010	N
x6	-0.0566351	0,000977	0,00477	0,069036	-0,8204	2,2010	N
x7	-0.661227	0,863484	4,21303	2,052566	-0,3221	2,2010	N
x8	0.639465	0,016872	0,08232	0,286912	2,2288	2,2010	S
x9	-2.51235	0,253408	1,23640	1,111937	-2,2594	2,2010	S
x10	-0.18012	0,000396	0,00193	0,043936	-4,0996	2,2010	S
* S = parameter is significant, N = parameter is not significant							

The above noted calculations' results proceeded in the following way:

1. Null hypothesis: $H_0: y = 0$ (parameter is significant)
2. Alternative hypothesis: $A: y \neq 0$ (parameter is significant)
3. Adjusted residual variance
4. S_{bi}
5. S_{ii} (square-root S_{bi})
6. T-value = y/S_{ii}
7. T-value $> t_{tab}$ (table value) $\Rightarrow H_0$ rejected \Rightarrow parameter is significant

The confidence interval for estimated parameters is on the significance level of 0.05.

The table above demonstrates which parameters (based on noted calculations) are statistically significant, because the null hypothesis is rejected and alternatively the parameters significantly differs from zero.

There are 5 parameters/coefficients proved to be statistically significant: x_2 (Unemployment rate), x_4 (Government debt), x_8 (Compensation per employee), x_9 (Gross domestic expenditure on R&D expenditures) and x_{10} (International trade balance).

4.3.5 Econometrical Verification

Econometrical verification is carried out through examination of autocorrelation, which is defined as the correlation between the residuals at different point of time. “*Error terms are auto-correlated if the values lagged one or more time periods, are not independent of one another. When autocorrelation is present, the least square estimators (the β) are not efficient. While they are still linear and unbiased, they are no longer **the best linear unbiased estimator (BLUE)***” (Mishra, 2012).

Autocorrelation of residuals is completed on the bases of the following Durbin-Watson test (D-W test) for the first order autocorrelation.

Confidence interval for estimated parameters is on the significance level of 5% ($\alpha=0.05$).

The Gretl software gives us the figure for the Durbin-Watson to be 1.328467.

The value of D-W always fluctuates between 0 and 4:

$d = 0$ positive autocorrelation

$d = 4$ negative autocorrelation

$d = 2$ no autocorrelation

Judging the autocorrelation, we must get the intervals – the lower (d_L) and the upper (d_U) critical value on level of significance $\alpha = 0.05$:

$d_L = 0.81396$

$d_U = 1.75014$

Positive autocorrelation	Inconclusive	No autocorrelation	Inconclusive	Negative autocorrelation
0	d_L	d_U	2	4
	0.81	1.75	2.25	3.19

D-W TEST:	1.32	<0.81; 1.75>	=>	Inconclusive zone
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According the D-W test, the decision cannot be clearly made on the first order of autocorrelation, because the reference interval is in the *Inconclusive Zone*. The test is inconclusive and therefore the econometric model cannot be considered reliable.

4.4 Discussion

The following chapter discusses the robustness of the selected regression model; reflects on chosen aggregates/factors – whether they fit the regression model; and last but not least critically evaluates the substances of the results – selected regression method (OLS) and conducted verifications. Consequently, the impact of independent variables on the dependent variable y (generated within the model) is summarized and explained.

4.4.1 Robustness of the Regression Model

The regression model was constructed with the intention to understand or even predict dependent variable y – Youth unemployment rate. As for the predictors for y , it was decided to use ten independent variables – $x_1 \dots x_{10}$. The motivation was to produce statistical methods that are not unduly affected by outliers and provide a method with good performance.

The selected method for the regression was the *Ordinary Least Squares* (see the following chapter for further discussion). At first, to ensure the robustness of the regression, it was attempted to detect Multicollinearity – significant correlation between a pair of independent variables. Hence, no multicollinearity was detected; it can be declared that none of the explanatory variables detracted the model from its robustness.

The *Coefficient of Determination* (R^2) is another measure to boost the viability of the formulated regression. However, the Coefficient of determination does not measure, if the independent variable was the absolute cause of the dependent variable change, if there was an omitted variable bias.

With the increase of the number of independent variables in a regression model, the R^2 will always go up. Therefore, we shall not let into an inexperienced interpretation to think that the model got better when the coefficient of determination implies the influence of independent variables on dependent variable y at likelihood 95%. Here it is needed to ask whether not too many variables were used in the OLS method.

Recommendations for further application of our regression and viability of the model would therefore be to scrutinize all of the possible variables (based on the findings from the experiment) and discard few to diminish the set of data and variables entering next experiment.

4.4.2 Methodology

The *Ordinary Least Squares* (OLS) regression method was used in the attempt to predict values of the dependent variable y (Youth unemployment rate) from the independent variables – $x_1 \dots x_{10}$. The OLS method was chosen to be applied in practice over other methods, because what distinguishes this regression from e.g. classification or ranking is that, in regression model the dependent variable attempted to be predicted is a real number. What's more, “ *in regression, when you produce a prediction that is close to the actual true value it is considered a better answer than a prediction that is far from the true value*” (Unsolved Mysteries of Science, 2009).

The next argument, in favour of the OLS, was that it provided a specific way of measuring ‘accuracy’ i.e. the sum of squared errors (this is what distinguishes the OLS from other forms of linear regression). Moreover, it was easy to implement on computer via software using linear algebra. Its implementation via software basis was efficient; meaning the experiment with 10 variables and 5 cross-sectional units (although vast amount of data was very time-consuming to collect and further work with) could have been run quickly through the software on computer. Last but not least, the OLS was chosen because it produced solutions that were easily interpretable – the OLS solved the parameter's value that we could have interpreted.

On the other hand, the OLS had also its downsides, such as problem's formulation, limited data access, processing time, or prediction time. When data collecting, special care had to be given to outliers – because the OLS can perform badly when there are excessively high or small values in a dataset – there data had to be handled carefully not to obtain a sample with outliers. Another difficulty arose when such a vast amount of variables (10) entered the regression; not only it slowed down the processing, but especially having too many independent variables, might have caused that high relevance of some variables was overshadowed by other variables to only moderate significance. The accuracy of the regression may have been also decreased by the wrong selection of independent variables. Even if many selected factors were good and relevant to the problem, the genuine relations between the independent variables and the dependent variable may well have been overwhelmed by the effect of few poorly selected factors.

4.4.3 Economic, Statistical and Econometrical Verifications

The least squared regression's results were run through a series of verifications to endorse accuracy and applicability of the experiment's results.

Initially, the estimated parameters (using the OLS method) were subject to economic verification to find out whether the results comply with the economic/macroeconomic assumption. Subsequently, the statistical verification's tools were implemented in attempt to demonstrate the significance (/insignificance) of particular parameters; p-value and t-test (t-value) were applied to prove/reject the null hypothesis on parameter's (in) significance. The statistical verifications enabled to increase applicability of the former model. At last, the econometric verification was attempted to ensure that the estimator generated in the model is the best linear unbiased estimator. For this purpose, the *Durbin-Watson* econometrical testing scheme was used.

If we combine the results of the economical and statistical verification, we obtain 5 reliable parameters – Unemployment rate, Government debt, Compensation per employee, Gross domestic expenditures on R&D and International trade balance – that are reliably, demonstrably and provably influencing the Youth unemployment rate. Naturally, all of them appear to have influence up to a certain point.

The econometrical verification (D-W analyses) was carried out in order to prove the 'BLUE theory' (best linear unbiased estimator); in other words, confirm the reliability of the model that previously conducted verifications suggested. Unfortunately, the output of the econometrical verification was inclusive. The D-W analyses result ended in the zone of indecisiveness, in other words it has not been conclusively proven that the model was either reliable or not.

Although, both economic and statistical verifications suggested the reliability of the model (significance of vast number of parameters); the econometrical verification did not prove so. Therefore, the regression model we formed for this experiment shall not be applied in practice unless some modifications take place (see previous chapter suggesting scrutiny of variables and discarding non-significant ones) to run it through econometrical verification again and clearly prove its reliability.

4.4.4 Impact of Independent Variables x... on Dependent Variable y

When attempting the experiment, we ran the processed data through the OLS parameter's estimation to obtain the parameters' values and be able to evaluate the impact selected independent variables have on the dependent variable (possibly to what extent).

Under the conditions ceteris paribus:

The unemployment rate positively influences the youth unemployment rate. If the unemployment rate rises, the youth unemployment rate will increase. When the unemployment rate rises by 1%, the youth unemployment rate will increase by 1.87%.

Change in real GDP negatively influences the youth unemployment rate. If the real GDP rises, the youth unemployment will decrease. When the real GDP grows by 1%, the youth unemployment rate will decrease by 0.1%.

Government debt positively influences the youth unemployment rate. If government debt grows, the youth unemployment will increase. When government debt grows by 1%, the youth unemployment rate will increase by 0.12%.

The household saving rate negatively influences the youth unemployment rate. If the household saving rate rises, the youth unemployment will decrease. When the household saving rate rises by 1%, the youth unemployment rate will decrease by 0.11%.

The consumer price index negatively influences the youth unemployment rate. If the consumer price index rises, the youth unemployment will decrease. When the consumer price index rises by unit, the youth unemployment rate will decrease by 0.06%.

Labour market policies negatively influence the youth unemployment rate. If public expenditures on labour market policies grow, the youth unemployment will decrease. When public expenditures on labour market policies grow by 1%, the youth unemployment rate will decline by 0.66%.

Compensation per employee positively influences the youth unemployment rate. If compensation per employee grows, the youth unemployment will increase. When compensation per employee grows by 1%, the youth unemployment rate will increase by 0.64%.

The gross domestic expenditure on R&D negatively influences the youth unemployment rate. If R&D expenditures grow, the youth unemployment rate will decrease. When R&D expenditures arise by 1%, the youth unemployment rate will decrease by 2.5%.

The International trade balance negatively influences the youth unemployment rate. If net exports rise, the youth unemployment rate will decrease. When the balance of trade increases by 1 billion US\$, the youth unemployment rate will decrease by 0.18%.

Based on the previous summary, we can confront the extent of impact on individual independent variables:

Whereas the impact change in real GDP, government debt, household saving rate, compensations per employee and international trade balance is rather moderate, CPI happens to have minimum influence and its parameter is rather insignificant in comparison with other factors (the factor could be discarded for the future applications of the model, the main purpose of its presence in the experiment was inclusion of inflation).

Unambiguously, the most significant impact on the youth unemployment rate was the Unemployment rate (1.87 percentage change) and Gross domestic expenditures on R&D (2.5 percentage change). Such outcomes deserve further analysis which will be conducted in the following chapter of the thesis – ‘Analyses of the Results’.

5 Analysis of the Results

The following chapter describes what can be deduced from the conducted experiment based on youth unemployment realities depicted in previous chapters. At first, the aim is to confront the results attained by the research with hypothesis set at the beginning of this paper; interpret the differences and outliers. Subsequently the findings are compared to the labour market reality, analysing the extent to which they fit the reality.

5.1 Confrontation with Hypothesis

When starting off the experiment of the dissertation, the hypothesis was derived presuming that particular macroeconomic factors are linked to the youth unemployment rate in selected EU countries. Concretely, following 10 predictors – Unemployment rate, Real change in GDP, Government debt, Consumer price index, Compensation per employee, Labour market policies expenditures, Household saving rate, Public expenditure on research and development, and International trade balance – are positively or negatively correlated with the youth unemployment rate in France, Germany, Spain, Poland and the UK.

Through calculations of the regression equation using the OLS method, the values of estimated parameters of independent variables were obtained:

Table 14: Estimated Parameters of Independent Variables

Parameter		Variable
1.87417	x2	Unemployment rate
-0.104272	x3	Change in real GDP
0.117043	x4	Government debt
-0.113808	x5	Household saving rate
-0.0566351	x6	Consumer price index
-0.661227	x7	Labour market policies
0.639465	x8	Compensation per employee
-2.51235	x9	R&D expenditures
-0.18012	x10	International Trade Balance

In the following section, results obtained through calculation, subdued to series of verifications (economical, statistical and econometrical) and interpreted in the previous chapter, will be compared to the hypotheses set at the beginning of the thesis based on economic reality in selected EU countries where the research was focused.

5.1.1 Unemployment Rate

The hypothesis supposed that the unemployment rate positively influences the youth unemployment rate; if unemployment rate rises, the youth unemployment rate will increase. The research supported the hypothesis by concluding that there exists a positive correlation between the unemployment rate and the youth unemployment rate. The estimated parameter indicates, when the unemployment rate rises by 1%, the youth unemployment rate will increase by 1.87%.

Comparing the results with the unemployment reality in EU countries (see Original Dataset; Source: (OECD iLibrary, 2013)), the rise of the youth unemployment since 2008 in France, 2008 in Poland, 2008 in Spain, 2003 in the UK were in a close accordance with the increasing unemployment rate over the same periods. Accordingly in Germany, both rates started increasing in 2005 and since 2006 have been decreasing in similar pace. Hence, it can be concluded that the hypothesis was correct, the youth unemployment rate and the unemployment rate are in narrow correlation.

When considering the evolution of the unemployment rate in the EU (since the beginning of the economic downturn), there is a clear contrast across the EU countries from the observed sample – in particular Germany shows ability to resist the unemployment ‘crisis’ whereas southern regions, namely Spain, registered the highest increase of unemployment. Nevertheless, the unemployment rate is a significant factor influencing the youth unemployment rate in a tight correlation and therefore needs to be paid diligent attention to when developing future employment policies to help ease the matter of the youth unemployment.

5.1.2 Change in Real GDP

The hypothesis presumed that change in real GDP negatively influences the youth unemployment rate; if the real GDP rises, the youth unemployment will decrease. The research provided us with the results that there is a negative correlation between

the change in real GDP and the youth unemployment rate. When the real GDP grows by 1%, the youth unemployment rate will decrease by 0.1%. The hypothesis was correct.

Judging from the Original Dataset sample (Source: (OECD iLibrary, 2013)), EU countries have 'smaller' economies in 2012 than in precedent years: France, Germany and the UK are scarcely growing (0% growth in 2012 for France, 0.7% in Germany, 1.9% in Poland, -1.4% in Spain, and 0.2% growth for 2012 in UK), former countries have experienced an average GDP decline of more than 2% over the observed period 2003-2012. It can be concluded there is a negative correlation between the change in real GDP and the youth unemployment rate – European economic growth has been on steep decline since 2007 and the youth unemployment rate started soaring dramatically around the same period – 2007/2008. The hypothesis proves to be correct.

Besides the negative correlation between the former and the latter factor, the results reveal other interesting fact – an upcoming shift in the wealth hierarchy within Europe. If the UK's economy continues to strengthen and along with its greater political weight, it will soon become one of the largest economies in Europe (right behind Germany, which is the only economy still expanding) possibly surpassing France. The euro crisis has locked Eurozone economies into a permanent depression. The Eurozone economies are struggling, getting smaller or relatively stagnant. Even just by staying where the UK is, it makes relative progress and ensures its future economic weight attracting investment, immigrants and boosting its economic growth.

5.1.3 Government Debt

As assumed in the hypothesis government debt positively influences the youth unemployment rate; if government debt grows, the youth unemployment will increase. The research calculations prove there is a positive correlation between government debt and the youth unemployment rate. When the government debt grows by 1%, the youth unemployment rate will increase by 0.12%. The hypothesis was formulated correctly.

Government debt appeared to be one of the most significant factors indicating the economic downturn in Europe as to be seen in the Original Dataset (OECD, 2013)). Government debt in all the countries from the sample has experienced unfavourable development since the onset of financial crisis in 2007/2008. Government debts have started

to grow dramatically in accordance with rising youth unemployment: in France since 2007, in Poland since 2008, in Spain since 2008, in the UK since 2007. The only exception is Germany, where against the growing government debt the youth unemployment rate was decreasing. Germany is therefore a case of a negative correlation between government debt and the youth unemployment rate, which rejects the hypothesis that government debt positively influences the youth unemployment rate (although it has been a case in France, Poland, Spain and the UK).

An explanation behind Germany's 'oddness' is its unique position within the EU economies – Germany is the only country still expanding and it is its growing economy that spurs the decrease of the youth unemployment rate – since it is the only country that is not locked in the economic downturn and not only manufactures in excessive amounts but also has a 'know-how' to export its goods on a growing scale of international trade balance.

The notion of a positive correlation between the government debt and the youth unemployment rate should therefore not be fully rejected. Germany's economy has harder times ahead – Germany will have a sharply declining population, hence its economic performance could change completely. The hypothesis shall be tested a decade or two ahead to capture the forthcoming changes and prove its viability.

5.1.4 Household Saving Rate

The hypothesis assumed that the household saving rate negatively influences the youth unemployment rate; if the household saving rate rises, the youth unemployment rate will decrease. The research provided us with the results that there is a negative correlation between the household saving rate and the youth unemployment rate. When the household saving rate rises by 1%, the youth unemployment rate will decrease by 0.11%. The hypothesis is correct.

When comparing the results with the real market developments, the impact is not too obvious. On one hand, the results determine the household saving rate to be relatively insignificant in terms of the degree of impact they have on the independent variable; on the other hand the household saving rate as observed in the Original Dataset (see Original Dataset; Source: (OECD iLibrary, 2013)) oscillates on the same level at most of the countries from the sample (e.g. in Germany (10.9% in average; 10.6% in 2012)). Therefore the hypothesis can still be considered correct, the household saving rate is in a negative

correlation with the youth unemployment rate, however taking into account statistical verifications of obtained results from the regression analysis, the significance of its influence is minor and negligible.

5.1.5 Consumer Price Index

The hypothesis supposed that the consumer price index negatively influences the youth unemployment rate; if the consumer price index rises, the youth unemployment will decrease. The findings of the research proved the correlation between the consumer price index and the youth unemployment rate to be negative. When consumer price index rises by a unit, the youth unemployment rate will decrease by 0.06%.

When the results were compared to the actual status quos (see Original Dataset; Source: (OECD. StatExtracts, 2013), the research findings are in accordance with the market reality solely in Germany; the CPI rose gradually as the youth unemployment rate was decreasing. When looking at other countries from the sample, the reality does not fit the findings; although there was a gradual rise of CPI in France, Poland, Spain and the UK, the youth unemployment rate continued to soar. The hypothesis is disproved.

The specificity of the current economic situation (permanent economic depression) is very likely to be the cause for rejection of the hypothesis. The Eurozone inflation accelerated, the annual consumer-price growth quickened, the consumer price inflation increased by a dramatic 22.5% in the selected EU countries over past ten years. These irregularities pose limitation on the econometrical model; therefore the consumer price inflation is considered a non-significant variable with minor influence on the youth unemployment rate.

5.1.6 Labour Market Policies

As presumed by the hypothesis, labour market policies negatively influence the youth unemployment rate; if the public expenditures on labour market policies grow, the youth unemployment will decrease. The research calculations proved the correlation between labour market policies and the youth unemployment to be negative. When the public expenditures on labour market policies grow by 1%, the youth unemployment rate will decline by 0.66%.

When the results were compared to the recent labour market developments (see Original Dataset; Source: (OECD iLibrary, 2013)), the public expenditures on active labour market policies oscillated at constant levels in all 5 sectional units from our sample with the range of percentage change 0.1 for France, 0.4 for Germany, 0.3 for Poland, 0.2 for Spain and 0.3 for the UK over the observed period 2003-2012. The constant levels of the labour market policies expenditures contradict with the steeply rising youth unemployment rate. When examining the data, we find that there has not been any negative influence of the labour market policies on the youth unemployment rate developments; consequently the hypothesis needs to be rejected.

To be able to veritabily examine the link between the youth unemployment rate and the public expenditures on labour market policies, the data would need to be more complex with a wider range of time series. Since the labour market policies' parameter is insignificant, there clearly cannot be presumed that public institutions and authorities are adapting 'wrong' approach towards setting the youth unemployment policies.

To perfectly cover its impact, the subject would have to be subdued to further examination, though scrutinizing each and every individual aspect and activity shall comprise: administration, training, job rotation and job sharing, employment incentives, supported employment and rehabilitation, direct job creation, start-up incentives, out-of-work income maintenance and support, early retirement, active measures, passive measures.

5.1.7 Compensation per Employee

The hypothesis of the paper assumed that compensation per employee positively influences the youth unemployment rate; if compensation per employee grows, the youth unemployment will increase. Findings of the experiment showed that the correlation between compensation per employee and the youth unemployment rate is positive. When compensation per employee grows by 1%, the youth unemployment rate will increase by 0.64%.

Looking at the reality of labour market developments (see Original Dataset; Source: (OECD iLibrary, 2013)), compensation per employee (CE) – including the total gross (pre-tax) wages, which are paid by employers to employees for conducted work over a specific accounting period – underwent the most significant decline after the great recession hit

Europe in 2007/2008. In recent years, however, the trend reversed and CE rose slowly and gradually.

The positive correlation with the youth unemployment can be clearly observed in France and Poland, where gradually with the increase of compensation per employee, the youth unemployment rate was growing. In Germany, Spain and Poland, the compensation per employee statistics does not exhibit any clear trend of either growing or declining. The positive correlation of compensation per employee and the youth unemployment rate does not follow the same course in all the sample countries, therefore the hypothesis has not been proven by the real labour markets development and should be rejected.

Despite the fact that compensation per employee was determined in an econometrical experiment as a significant factor influencing the youth unemployment rate, the trend developments of the former does not indicate the extent of its impact. Hence further examination of more complex data (extended time series and wider sample of countries) should be conducted to clarify the link between compensation per employee and the youth unemployment rate. Until then the hypothesis has to be rejected.

5.1.8 R&D Expenditures

The hypothesis supposed that the gross domestic expenditures on research and development negatively influence the youth unemployment rate; if the R&D expenditures grow, the youth unemployment rate will decrease. Calculated through regression analysis, the results obtained proved there is a negative correlation between the gross domestic expenditures on R&D and the youth unemployment rate. When R&D expenditures rise by 1%, the youth unemployment rate will decrease by 2.5%. It concludes that the hypothesis was formulated correctly.

When comparing the regression analysis results with the statistics mapping the real market developments (see Original Dataset; Source: (OECD iLibrary, 2013)), we can see that the gross domestic expenditures on R&D gradually rose over the observed period of time in all sample countries (in the UK the increase was only moderate), simultaneously with the rise of the youth unemployment rate (with the exception of Germany). However the hypothesis assumed that a country's investment in development and innovation (in the EU sample countries it was 1.7% of a country's GDP in a decade average) should lead to the decrease of the youth unemployment rate; in reality the latter was soaring instead. The contradictory

development rejects the hypothesis that the public expenditures on R&D are a significant parameter that negatively influences the youth unemployment rate.

In order to shed a light onto the failed hypothesis, a closer look at R&D expenditures should be taken. The public expenditures on R&D comprise of tools such as grants, procurements, tax incentives and direct performance of research (in public laboratories or universities). Apart from the tax incentives that have a relatively positive and immediate effect on the R&D financed by business, government-financed R&D effects are rather long-term driven and therefore our experiment operating with a limited dataset could not entirely cover its influence on the youth unemployment rate.

Moreover, unless the government incentives go hand in hand with additional R&D invested by firms (which are very often reluctant to do so since the durability of government support is uncertain), the impact on the labour market is not significant. Also a degree to which the government-funded R&D (conducted e.g. in universities) influence the private R&D positively plays a crucial role. If we estimate that the effect of the government-funded R&D on the private R&D is positive, it will be still veritably smaller and statistically minor than the effect of the private R&D capital. The public expenditures should therefore be subdued to further examination, extending the hypothesis by private R&D and its relation with the former.

In addition, the difference across regions in innovation and diffusion of technology may be other explanatory component of the failed hypothesis. Due to lack of R&D capabilities the poorest regions cannot adapt the advantages of the most advanced technologies available elsewhere. In poor regions (determined by predominance of agriculture) the unfavourable industrial structure hampering the economic growth prevents the regions from having substantially as obvious outcomes of R&D as the richer regions have. This disharmony explains the growing youth unemployment rate on national levels although the R&D expenditures might have been in a negative correlation regionally. Since the experiment used only national data, the regional disproportion could have not been detected.

In order to rediscover the influence the public expenditures on R&D have towards the youth unemployment rate, a simultaneous equation model using regional data should be carried out.

5.1.9 International Trade Balance

The hypothesis derived from the macroeconomic reality, presumed that the international trade balance negatively influences the youth unemployment rate; if the net exports rise, the youth unemployment rate will decrease. Results of the experiment give evidence that the correlation between the international trade balance and the youth unemployment rate is negative. When the balance of trade increases by 1 billion US\$, the youth unemployment rate will decrease by 0.18%.

When trying to prove the hypothesis by confronting the calculation results with the recent EU market developments (see Original Dataset; Source: (OECD. StatExtracts, 2013)); we can notice that the international trade balance of a selected number of EU countries was falling significantly over the observed period, the balance of trade has experienced a steep decline especially since 2007 in most of the countries; simultaneously the youth unemployment rate has started rising dramatically since 2007/2008 (when the financial crisis fully hit the EU). The only country standing out of the sample as an exception was Germany: (Putting aside that it was the only country that managed to keep its international trade balance in positive numbers) the balance of trade was increasing over the observed period, and simultaneously the youth unemployment rate was gradually decreasing. Both cases proved the hypothesis to be correct and the correlation between the international trade balance and the youth unemployment rate to be negative.

Inspecting the link between the former factors more in detail, both the calculations results and the observed data prove the international trade balance to have a major impact on the youth unemployment rate. In Germany's case, it was the export oriented economy (positive and growing net export numbers) that spurred country's economic engine and employment. This macroeconomic factor should be therefore perceived as a very significant one for future improvement policies.

5.2 The Results in Sum

The precedent chapter, based on the conducted research, analysed the influence of particular variables and its estimated parameters on the dependent variable – the youth unemployment rate – and confronted the results with the hypotheses stated at the beginning of the paper.

The viability of the hypotheses was proved for the following factors: the unemployment rate positively influences the youth unemployment rate; the change in real GDP negatively influences the youth unemployment rate; there is a positive correlation between government debt and the youth unemployment rate; there is a negative correlation between the household saving rate and the youth unemployment rate (although the influence is minor); there is a negative correlation between the international trade balance and the youth unemployment rate.

Due to the physical limits of the experiment and it lacking a complex set of data, the hypotheses were disproved for the following factors: a correlation between the consumer price index and the youth unemployment rate did not prove to be negative; the influence of the public expenditures on labour market policies on the youth unemployment rate did not prove to be negative; a correlation between compensation per employee the youth unemployment rate did not prove to be negative; lastly the gross domestic expenditures on R&D did not prove to have negative impact on the youth unemployment rate.

6 Conclusion

The world economies are facing an important year in 2013; the budgetary, economic and currency crisis as well as increasing commodity prices have hit all major economic powers – China, the US, the EU; it will be a challenging global economic environment and it is the governments who will play a crucial role trying to end the economic recession.

Despite the financial crisis and the economic downturn in the region, the EU still manages to keep its position of a major world economic region and a top import market worldwide. However in a detailed scope, the Eurozone has been locked into a permanent depression (set off by the euro currency crisis), growth has evaporated and economies are stagnating. The only economy still expanding is Germany. Nonetheless, the predictions say that even Germany is fated to a decade or more of a decline just like its European neighbours. Unless Europe introduces a major shift in economic policy and puts solutions into action, it will lose its privilege. Despite recent actions, resolution to the crisis still remains elusive.

One of the economic indicators outspokenly depicting the situation Europe finds itself in is the youth unemployment rate: *“The overall unemployment rate of the EU-27 is currently at 10.6%, while in the euro area it reaches 11.6 %, the highest level since the birth of the EMU. In May 2012 the number of unemployed in the EU exceeded 25 million people for the first time ever and it has increased by an additional 0.75 million in the quarter since then bringing the increase to almost 9 million since 2008”* (Europa.eu, 2012).

The unemployment rate reflects the situation of jobs in a region and it indicates that there is a mismatch between labour skills and education needed by the market and the real characteristics of the labour force. The situation of youth in unemployment is even more severe; the youth in most of the Eurozone countries are burdened with excessive public debts and it is them who will be required to repay the debts (created by precedent generations) with their taxes in the future. The indebtedness strongly limits the possibilities of a country to invest in employment initiatives, finance education, enhance the growth; austerity policy’s cut on public investments reduces the complementary private investments (essential to spur the economic growth again).

Apart from the bequest of high public and private debt, the current youth faces other mistakes produced by the generation of their parents – the high unemployment’s long-term scarring effects on their well-being. The evidence suggests (Wise, 1982) that most unemployment is concentrated among those youth who face serious difficulties in obtaining

jobs. *“The teenage unemployment problem is not the lack of desire to hold jobs, but the inability to find work. A shortage of jobs appears to be the only explanation for the large responsiveness of employment to changes in demand. If unemployment were simply a matter of instability, there would be little reason to expect it to respond strongly to aggregate demand. We conclude that the existence of a job shortage must be the central reality dominating efforts to evaluate or design structural initiatives to improve the labour market for youths”* (Wise, 1982).

To respond to the rapidly growing youth unemployment numbers in the EU, the European Commission implied newly proposed legislations, initiatives and policy activities. *“During the 2008-2011 period, the 'health and social work' sector created more than 1.8 million new jobs and the net demand in this sector is expected to increase by 8 million up to 2020. In the ICT sector, by 2015, is expected that up to 700 000 unfilled vacancies will be valuable for ICT practitioners”* (Europa.eu, 2012). The aim of such activities is to ensure sustainable growth as well as reinforcement of social inclusion and attainment of quality jobs. Any decision cannot be expected to change the situation overnight; structural changes take several years to be put into function and resolve things. In order to stabilise the European labour market again, future policies must focus on the availability of more jobs and the maintenance of unemployment. Best insurance against the youth unemployment is still educational qualification, the lower the level of education, the greater the risk of unemployment; last but not least transition from school to the working life must be improved in order to reduce the youth unemployment.

Many member state countries (particularly those with not only high unemployment levels, but also financial and fiscal difficulties – Italy, Spain, Portugal etc.) have already started implementing reforms and have anchored in their countries’ legislation process reduction of severance pay, simplifications of working arrangements (increasing flexibility of the labour market), as well as renewed wage-settings system more reflecting the reality. In general, these proactive measures are designed to increase incentives to work. Some rather negative – punishing measures – were implemented as well to extend the working lives of labour force. Those were for instance resetting of retirement age or penalisation of early retirement.

Individual EU member countries at the same time realise the importance of education – whether the primary one (getting people the qualification or training for their first job experience) or the lifelong one (that is starting to be largely encouraged reflecting labour market needs) which enable people to reposition themselves in workplaces in the further

stages of their working lives. Despite the attained education and vocational training, there has been an increasing group of youth facing the school-to-work transition problem. In such case implementation of labour market reform based on training in a combination with practical (subsidized) work experience in the private sector, could mean solution to the youth issue. It is the dual-apprenticeship programmes that have helped Germany keep its youth unemployment rate well below the European average. Apprenticeship could be the most efficient way to ensure sustainable unsubsidized employment.

The presented dissertation focused on investigating the former youth unemployment phenomenon. The recent labour market developments, government-driven interventions as well as private sector efforts to decrease the youth unemployment rates in particular countries were analysed to get a deeper understanding of the issue. Subsequently, the experiment was conducted to answer the derived research question – whether particular macroeconomics factors (predictors) were enhancing or decreasing the youth unemployment rate in selected EU countries; respectively is the unemployment rate, GDP, government debt, consumer price index, compensation per employee, labour market policies expenditures, household saving rate, public expenditure on research and development, and the international trade balance positively or negatively linked with the youth unemployment rate in France, Germany, Spain, Poland and the UK?

The hypothesis presumed that there was a positive correlation between the unemployment rate and the youth unemployment rate; a negative correlation between the change in real GDP and the youth unemployment rate; government debt positively influenced the youth unemployment rate; the household saving rate negatively influenced the youth unemployment rate; the consumer price index and the youth unemployment rate were negatively correlated; the labour market policies negatively influenced the youth unemployment rate; compensation per employee and the youth unemployment rate were positively correlated; the public expenditures on research and development influenced the youth unemployment rate negatively; and the international trade balance influenced the youth unemployment rate negatively.

As derived by the research question, the objective of the dissertation was to identify the significance, magnitude and applicability of the influence of particular macroeconomic factors entering the regression analysis on the youth unemployment rates in selected EU member countries.

The experiment applied the *Ordinary Least Squares* (OLS) regression method to estimate the parameters of dependent variables (macroeconomic predictors) influencing the independent variable generated in the model – the youth unemployment rate. Although aware of the peculiarities of the recent crisis, it was believed that the econometric results would facilitate a better understanding of the impact of the 2007/2008 financial crisis on the youth unemployment labour market.

After conducting the analysis, it can be concluded that even though the results of statistical and econometrical verifications pointed out that the model was subjected to several limitations, yet the experiment in the end revealed clear dependency of particular macroeconomic factors on the youth unemployment rate.

That being said, there is room for further enhancement of the model. Recommendation for other predictors worth-testing include economic factors (such as minimum or real wage, euro exchange rate, consumption) as well as social elements (social behaviour, social bad incentives to return to the market, consequences of graduation from college in a bad economy etc.). Physical limits of the experiment were mainly due to the limited access of data, relatively short time-series that made dataset highly sensible to particular trends or omitted variables (which parameters might have been found significant if the testing criteria had not been set up in a relatively conservative setting). The current crisis represents a specific limitation for the model as well.

The viability of the hypotheses was proved for the following factors: the unemployment rate positively influences the youth unemployment rate; the change in real GDP negatively influences the youth unemployment rate; there is a positive correlation between government debt and the youth unemployment rate; there is a negative correlation between the household saving rate and the youth unemployment rate (although the influence is minor); and there is a negative correlation between the international trade balance and the youth unemployment rate. Due to the physical limits of the experiment (relatively short time series and exclusion of other model-worthy variables), the hypotheses were disproved for the following factors: a correlation between the consumer price index and the youth unemployment rate did not prove to be negative; the influence of labour market policies on the youth unemployment rate did not prove to be negative; it was disproved that compensation per employee negatively influence the youth unemployment rate; lastly the gross domestic expenditures on R&D did not prove to have negative impact on the youth unemployment rate.

The results revealed that the impact of the 2007/2008 financial crisis on the youth unemployment rate goes beyond the impact resulting from the other macroeconomic factors (such as changes of GDP); moreover the effect on the youth unemployment rate is much greater than the effect on the total unemployment. The results detected the most severe effects the financial crisis has had on the youth unemployment rate to be found in the second and in the third year after the onset of the crisis in 2007/2008. Practical implications of the results suggest that it is the active labour market policies and better school-to-work transitions institution that are needed to reduce the youth unemployment rate, more broadly the risk of persistence of the long-term (structural) unemployment. It is the youth that has been most severely affected by the recent crisis; therefore major relief efforts shall be focused on young people.

Based on the analysis, the paper argues in favour of investments in the education and infrastructure. Vocational education and training in combination with work experience will facilitate the work-to-school transition and will become a bridge in obtaining the first employment (a problem the 16-24 demographic group is struggling with at the moment). Implementation of labour market reforms must be adapted to a country's economic and institutional context.

Youth unemployment in the EU may not be a fixable problem in the short term and may have rather chronic indications; nonetheless it can be reduced through the concerted efforts of all interested parties. It will be a task for governments to secure the sustainability of future sovereign debt policies (not only the debt's volumes to be repaid by present and future generations, but also size of an economy), evaluate austerity programs regarding the output losses related to the unemployment, as well as forgone investments (especially the ones in the human capital) vital to increase the future size of an economy.

The proposed paper proved that the youth unemployment is a researchable issue and it is a social problem – social issue in the global economy and labour markets. The future of youth labour market developments are going to be determined by government-driven policies, economic growth, labour market institutions, private sector, and last but not least the demographic factors – the youth itself. Luckily the prospects are positive; young people (whether you call them NEETs, *freeters* or boomerang kids) are eager for a chance to thrive.

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9 Appendix

Appendix 1: Germany Age Structure; Source: (CIA World Factbook, 2013)

