Vysoká škola ekonomická v Praze

Národohospodářská fakulta

Hlavní specializace: Národní hospodářství

IMPACT OF EURO-AMERICAN CRISIS ON ITALIAN LABOUR MARKET: THE CASE OF YOUNG PEOPLE (GENERATION)

Bachelor's Thesis

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Year: 2018

I declare that I have written this thesis on my own, with the help of the cited literature.

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In Prague, May 14, 2018.

Acknowledgements

1 Abstract

This thesis investigates the impact of the 2008 global financial and economic crisis on the situation with Italy's youth labour market. The findings of the thesis prove that the global crisis had major adverse effects for the Italian economy and boosted negative tendencies which had been previously prominent in the Italian labour market, namely on its youth segment. The regression analysis model developed within this thesis proved itself to be invalid, showing that shifts in Italy's youth unemployment cannot be explained effectively by shifts in the country's GDP. Nevertheless, the thesis illustrates how the deterioration in Italy's economic situation affected its youth labour market in 2008-2009, and what long-standing detrimental effects it had for the country.

2 JEL classification

3 Key Words

Abstrakt

Tato práce zkoumá dopad globální finanční a hospodářské krize v roce 2008 na situaci s italským trhem práce s mládeží. Závěry diplomové práce dokazují, že celosvětová krize měla pro italskou ekonomiku velké nepříznivé důsledky a posílila negativní tendence, které se předtím objevovaly na italském trhu práce, zejména v segmentu mládeže. Model regresní analýzy vyvinutý v rámci této práce lze považovat za neplatný, což ukazuje, že posuny v nezaměstnanosti mládeže v Itálii nelze účinně vysvětlit změnami HDP země. Nicméně bakalářská práce ukazuje, jak zhoršení ekonomické situace Itálie ovlivnilo trh práce s mládeží v letech 2008-2009 a jaké mělo dlouhodobé nepříznivé důsledky pro tuto zemi.

Klíčová slova

Hospodářský růst, HDP, globální krize, zaměstnanost, Itálie, trh práce, nezaměstnanost, práce s mládeží.

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1 Introduction

Despite the fact that the global economy is steadily developing and growing in the long-term perspective, crises often occur as a result of the cyclical processes of growth and decline. Such economic crises may take various forms, and may vary significantly in their scale and depths. The greatest and most dangerous crises are global crises. They occur on the global scale, and therefore affect all states, regardless of their geographic location, focus on particular activities, economic strength, and so on. The consequences of global crises are disastrous, and the entire global economy requires time and effective measures on the part of all community members in order to overcome them.

The 2008 global financial and economic crisis was an example of a major global crisis ravaging the entire international economy. Starting with the American real estate market and thereafter spreading to the financial sector, the crisis quickly covered European states and the rest of the world due to the greatest interdependence between the financial sector and the real economy of all countries all over the world.

It should be noted in particular that global crises affect greatly governments' opportunities to finance state development programs. As a result, one of the greatest adverse conditions of such crises is the growing rates of unemployment. They affect much the overall level of the population's social standards, and thus lead to major deteriorations in the quality of life. For youth, such consequences are particularly detrimental, as due to the growing unemployment rates, young people might lose time for gaining experience in their work.

This thesis will be dedicated to the investigation of the impact of the 2008 global financial and economic crisis on the labour market of Italy, namely in the context of youth.

The choice of Italy for this research paper is due to the fact that the Italian labour market has been demonstrating great fluctuations in terms of the level of unemployment and other major indicators in recent years. As a result, this situation impairs the prospects of the Italian national economy, and makes Italy lag behind the EU's most developed states in overall terms. Therefore, it is particularly topical and relevant as of today to investigate the situation within Italy's labour market in order

to reveal the main reasons behind them, and to analyze how this correlates with the overall situation in the EU. A focus put on the investigation of the situation in Italy's labour market during the 2008 global financial and economic crisis would be beneficial, as it may provide an insight on how the EU's market, and namely the Italian one, reacts on deep crisis events.

Moreover, for the purpose of this thesis, it has been decided to focus specifically on the youth segment of the Italian labour market, as the youth is the most flexible, adaptable and progressive part of the population, accepting innovations and generating creative ideas. Therefore, any degradation of the situation in the labour market's youth segment might bear major negative consequences for any country's long-term economic development. In the case of Italy, this becomes particularly important to monitor taking into consideration the overall negative tendencies in the country's labour market.

The main aim of the thesis is to investigate to which degree the crisis affected the Italian youth labour market.

The research question to be answered based on the findings of the thesis is the following: to which extent did the 2008 global crisis affect the Italian labour market on the youth segment, and what consequences did it have for the country's overall economic situation?

The hypothesis to be tested in this thesis is the following: a model for analyzing changes in Italian youth unemployment can be based on GDP as a measure of economic growth, current account balance as an indicators of international economic effectiveness and government debt as an indicator of financial stability.

The theoretical part will focus on the investigation of indicators characterizing the development of the labour market, and namely its youth segment. The theoretical research will be followed by empirical analysis. The empirical analysis will be based on time series analysis: we will track the dynamics of the Italian labour market during the crisis period, and will draw appropriate conclusions pertaining to the aim of the thesis. The statistical data to be investigated will be taken from official sources such as the Italian National Institute of Statistics and the World Bank. The main indicators which we will analyze will include the unemployment

rate, the employment/population rate, the labour force participation rate, minimum wages, and so on. Also, we will use linear regression for tracking the correlation between the country's unemployment rate and its GDP per capita. In addition to this, we will focus on the investigation of important labour market parameters such as work participation, labour force mobility, and degree of concentration.

The main methods to be used in this thesis will include secondary research (for investigating the theoretical aspects related to the research topic, and to draw statistical data required for the practical part of this scientific investigation); elements of statistical analysis, including linear regression analysis (for the purpose of evaluating the effects of the 2008 global financial and economic crisis on the Italian labour market, namely as related to its effects on youth), and deductive thinking (for providing the author's own opinion regarding the research question supported by arguments drawn throughout the research).

Among the bibliographic sources to be used for writing the thesis, it is worth noting Freeman, R. and Wise, D. (2007). The Youth Labour Market Problem. This book deals specifically with the youth labour market and measurements of its dynamcis. The book by Coletto, D 2010, Effects of economic crisis on Italian economy, will be used for analyzing more in detail the effects of the 2008 global crisis on the Italian economy, including on its youth labour market. Other sources will be used as well.

Based on the obtained results, conclusions will be drawn with regard to the effects which global crises cause for the labour market, and namely for the youth in it, and to which actions might be undertaken by governments for remedying those adverse effects.

2 Theoretical Part

2.1 Labour Market: Definitions and Key Aspects

In order to investigate in detail the labour market and its key parameters, it is worth first providing an overview of the key notions and concepts pertaining to this research topic.

In the heart of the labour market lies the concept of labour. In general terms, labour can be defined as "*the exertion of mind or body or both with a view of earning an income.*" In technical terms, labour includes all physical and mental efforts which a person puts into his or her work activities with the ultimate aim of earning an income (Fernando 2011, p. 323).

Therefore, as can be seen from the definitions outlined above, labour can be characterized by two key aspects: it includes inputs (physical and mental resources put by persons into the work process), and outputs (the results of labour as products or services and as the income earned by those who perform labour for the aforesaid products or services). A key characteristic of labour which makes it differ from any other kind of work is the fact that it allows individuals gaining income for ensuring their best economic and social living conditions (Lowes 2013, p. 221).

The term "labour market" can be defined in different ways depending on the particular point of view to the inherent labour market problems as investigated by different researchers. From the perspective of economic theory, a labour market can be defined as "*a process by which supplies of a particular type of labour and demands for that type of labour balance or seek to obtain a balance.*" (Parakashan 2013, p. 43). From the practical perspective, a labour market can be defined as "*the market for hiring and supplying labour to perform certain jobs at a wage rate.*" (Parakashan 2013, p. 43).

Also, different definitions of the term "labour market" can exist based on the demand or supply side chosen for the investigation of this phenomenon. Thus, from the demand perspective, a labour market can be defined as "*the labour supply shed*

or worker recruitment space," while on the supply side, it can be defined as a "*geographical area in which workers can change jobs*" (Clark et al. 2010, p. 458).

In its operation, the labour market performs several essential functions. The main functions of the labour market are the following:

- Economic function. The labour market ensures the satisfaction of employers' needs in labour resources, ensures the placement and re-distribution of labour resources, and guarantees the best performance of the national economy thanks to the effective use of labour resources;

- Social function. By balancing labour supply and labour demand, the labour market guarantees the most effective social standards of the population's living, provides the population with opportunities to fulfill its basic needs for living, and to finance further expenditures associated with recreation;

- Stimulation function. The labour market ensures the best competition between employees on the one hand and between employers on the other hand. As a result, competing with each other, both have to show their best effectiveness, and thus to raise their skills or brand image, etc. (Aamaas 2012, p. 149).

The labour market can be conditionally divided into the following types based on the geographic size:

1. Local labour market. This labour market concentrates around a local community, and embraces the employees and companies of a city, metropolitan area, agglomeration, etc. It is the smallest labour market unit on which most companies seek labour resources to fill their vacancies;

2. Regional labour market. This labour market embraces the territory of a region, and is broader compared to a local labour market;

3. National labour market. This labour market covers the territory of an entire state, and includes all its labour resources;

4. International labour market. The boundaries of this labour market go beyond the frontiers of a single state, and cover at least two states' labour markets at once;

5. Global labour market. This kind of labour market covers all labour resources around the globe (Caruth and Handlogten 2001, p. 105).

Within the framework of this thesis, the main emphasis will be put on the investigation of national and international labour markets. Namely, the Italian national labour market, and particularly its youth segment, will be paid the greatest attention. Sporadically, differences on the regional level within Italy will be analyzed too. In the international context, the situation in the Italian labour market will be compared with the situation in other European Union member states. Namely, the impact of the global financial and economic crisis will be evaluated not only for Italy and its national economy, but also for other EU member states. The analysis of the international situation will be required in order to get relevant conclusions by comparing Italy with other developed EU countries and by emphasizing the most topical issues which currently exist in Italy's youth unemployment.

Depending on the official nature of employment, there may exist the following labour market types:

1. Regulated labour market. This market covers the official employment within a particular area. People within this type of labour market are employed officially, taxes are paid on their income, etc. This kind of market is beneficial to the state, as it is transparent and is monitored by the public authorities.

2. Unregulated (shadow) labour market. In this kind of labour market, all employment is unofficial, and payments made to the employees are avoiding taxes. The operation of this kind of labour market brings harm to the national economy, but may sometimes be beneficial by providing effective economic and social opportunities to the poorer population layers (Robertson 2000, p. 13).

Now, coming back to the definition of labour market in the context of economic theory, it is also worth providing the definitions of the terms "labour supply" and "labour demand". Labour supply can be defined as *the existing force of workers, who are working or are available to work, at a given quality level (consisting of the mix of education and training, skills, and experience), under all the social conditions in which they live and work.*" (Harris 2006, p. 105). Therefore labour supply stands for the entire amount of labour resources ready to perform their

direct functions in the given market within a particular time period. At the same time. labour demand can be defined as the "*current range of job positions that employers determine are needed to run their various businesses.*" (Harris 2006, p. 105).

In the conditions where the supply of labour exceeds its demand, unemployment exists in the labour market. However, there are different types and forms of unemployment inherent of the labour market which should be investigated more in detail. Thus, such main types and forms of unemployment are the following:

- Frictional unemployment. This type of unemployment can be defined as "*that due to normal job turnover – that is, temporary mismatches between those out of work and the jobs available.*" In the case of frictional unemployment, there are no major disproportions between labour supply and demand. People leaving their job need some time to find a new one and make their choice. Similarly, companies need some time to find a replacement for the workers who left: those labour resources constitute the basis of frictional unemployment (Dumas 2016, p. 183). Overall, it can be stated that frictional unemployment as necessary for balancing the demand and supply of labour in any market, and its existence is preconditioned by objective reasons;

- Structural unemployment. This type of unemployment can be defined as "*unemployment that arises from a mismatch between the skills required for the available jobs in the community and skills possessed by those seeking work.*" The existence of structural unemployment is a normal situation for the economy, as it occurs when there are technological changes in the economy, and may incite the local labour market participants to improve their knowledge and skills, achieve higher professional development, etc. (Rejda 2015, p. 291). Similarly to frictional unemployment, it can be stated that structural unemployment does not necessarily mean any harm to the national economy. It is associated with technological change, and thus means that people who are currently unemployed are adapting and raising their skills so as to match the new work conditions;

- Natural unemployment. Natural unemployment is equal to the sum of the rates of frictional and structural unemployment. Natural unemployment is

considered to be normal for any national economy, and is generally unavoidable due to temporary mismatches between job vacancies and job seekers (Dumas 2016, p. 183);

- Technological unemployment. This type of unemployment "*results from the displacement of workers by new computer technology, labour-saving machinery, new production techniques, or new management methods.*" Technological unemployment has both advantages and disadvantages. Thus, on the one hand, it allows companies raising their business effectiveness through the application of new technologies, and on the other hand, it ultimately cancels particular jobs, and makes them unavailable for people (Rejda 2015, p. 291). Obviously, with the growing pace of technological progress, the level of automation and the use of robotic technologies is steadily growing, while the use of manpower tends to decrease;

- Cyclical unemployment. This type of unemployment can be defined as "*a type of unemployment which is related to the cyclical trends in the industry or the business cycle.*" Cyclical unemployment follows the patterns of a country's economic development: if the economy is on its peak, the unemployment rates will be the lowest; on the contrary, in times of recession, cyclical unemployment will be the highest. Cyclical unemployment imposes major threats on the development of national economies, and therefore countries' governments should seek to minimize its rates (The Economic Times n.d.) Cyclical unemployment will be of the greatest interest within this research. Namely, when investigating the impact of the global crisis on the Italian youth labour market, we will focus first of all on cyclical unemployment within the structure of total unemployment as an indicator illustrating the actual degree of negative tendencies which occur within a country's national economy during the time of major crises;

- Seasonal unemployment. This type of unemployment stands for "*joblessness related to changes in weather, tourist patterns, or other seasonal factors.*" Seasonal unemployment thus occurs only during particular time periods and

is associated with the structure of the particular national economy (Hall and Lieberman 2010, p. 554).

In addition to this, it is also worth noting the main types of employment (Dumas 2016, p. 183):

- Full-time and part-time. Full-time employees work within the full work week stipulated in the national legislation, while part-time employees work only part of scheduled time, often combining several works.

- Fixed-term and contract. Fixed-term employment assumes that employees are hired for a specific period of time, while contract employment means that employees are hired for the performance of a specific task.

- Commission and piece-rate employment. Employees working under the commission scheme are paid a fixed amount of money on a regular basis. On the contrary, piece-rate employment means that employees are paid proportionally to their performance.

Within the framework of this thesis, the main focus will be put on full-time employees making a part of Italy's youth labour market, as this category of employees is the largest one, and therefore reveals best the ongoing tendencies, particularly during the times of crises.

Now, having investigated the basic theoretical aspects related to labour market and unemployment, it is worth proceeding to the next chapter of the thesis where an overview of the historical development of the labour market will be provided.

2.2 Specificities of the Youth Labour Market

When analyzing the youth labour market, it should be borne in mind that this is just one segment of the labour market segregated based on the age criterion. Thus, according to the International Labour Organization, the term youth labour embraces all persons aged 15 to 24 (International Labour Office 2013, p. 4). This is a segment of the larger labour market, and its specificities will be outlined below.

First of all, it should be noted that youth labour force is characterized by lower education levels compared to adults. People belonging to the youth labour force may be often without university education due to their age or due to the need for work, without the opportunity to continue studies. Otherwise, it may embrace people who have just terminated their studies, and therefore do not have any practical professional experience. As a result, the youth labour market is characterized by the fact that young people may often face problems with the search for employment on the one hand and are often offered lower wages on the other hand (Albk 2015, p. 74).

The labour force on the youth segment is characterized by lower participation rates, which is often due to a set of reasons: pursue of studies, military enrolment, and so on, which makes the employment of youth impossible (International Labour Office 2013, p. 50). The youth's overall lower participation is thus caused by objective reasons. In the long run, it leads to the fact that the youth has higher level of unemployment compared to adult population, and thus by the overall lower economic output generated.

Another distinctive characteristic of the youth labour market is the high labour force mobility. Young people are more flexible in their work career, may obtain new knowledge and skills more quickly and easily, and therefore can adapt successfully to new work conditions. On the other hand, young people are always willing to seek some new opportunities, value the opportunity to fulfill their creative thinking, and therefore may often leave their current job for seeking better opportunities elsewhere (Gunderson and Fazio 2014, p. 8). In addition to this, it is worth noting in particular that the youth constitutes the greatest customers of modern online and digital technologies. Young people are more prone to innovations and may change their professional specialization more quickly and effectively compared to older population, which makes young employees attractive to potential employers.

In the current conditions, the youth labour market is also characterized by a high degree of concentration: young people to choose those jobs which are potentially more fruitful in financial terms, due to which there may be inconsistencies between labour demand and supply in different labour market segments (Banerji 2014b, pp. 7-12). We can consider this as an important drawback

of the youth labour market segment. Even though young people are more flexible, they tend to seek jobs in those sectors where wages are overall higher, which in the long run contributes to issues with disproportions within the national economy.

The youth labour market also tends to be characterized by higher unemployment levels compared to adults, even though with some variations across countries, which is due to the reasons outlined above (Banerji 2014b, pp. 7-12).

Based on the information above, it can be stated that the youth segment of the labour market is indeed very specific, and those particularities should be taken into account when investigating the impact of the global financial and economic crisis on the situation in Italy's youth labour market.

Therefore, as can be seen from the information provided in this chapter, the youth labour market is quite a specific segment of the larger labour market. In the next chapter of the thesis, the current problems in the labour market will be investigated.

2.3 Current Problems of the Labour Market

As of today, the global labour market is characterized by a great number of different issues. In this chapter, only basic of them will be investigated, particularly those having relevance of this research.

1. Long-term unemployment

Long-term unemployment stands for those people who have been without work but willing to work for at least the last 12 months. The problems with persistent long-term unemployment are of major importance for all countries around the globe. The major negative effect of long-term unemployment is the fact that the persons falling under this category have no means for ensuring decent living conditions. As a result, the government is forced to pay unemployment benefits to such persons, which in the long run only brings harm to the national economy, as no economic output is achieved in response. For remedying problems with long-term unemployment, economic reforms and structural changes are required (International Labour Office 2002, p. 337).

Long-term unemployment is a particularly important issue when speaking of the youth labour market. Young people who are often graduates from high schools do not have any practical experience in their work, which makes them less attractive for potential employers who seek qualified workforce. In case of long-term unemployment, young people lose important time which could have been used otherwise for gaining valuable experience. Moreover, with the course of time they may also lose the theoretical skills obtained through education, and might face greater problems in the subsequent adaptation.

2. Use of immigrant force in employment

The use of immigrant labour force is most often popular in developed economies. This is due to the fact that immigrants coming to those states most often seek unskilled labour participation, and are ready to work for very low wages. Although this may be positive for employers through the opportunity to spare on wages, for the national economy this means that immigrants receive those jobs which could otherwise be obtained by local workers. This raises the levels of unemployment, and therefore is to be addressed, for instance, through elaborated immigration policies. Also, this brings major damage to the formation of national human capital (Freeman and Wise 2007, p. 247).

This issue is particularly important for the European Union and Italy as the EU's member state. Namely, with the immigration boom which has been ongoing in the European Union in recent years, the total share of immigrants in the EU rose, which means that the markets of the EU member states are more saturated with the immigrant workforce. This is particularly bad for the youth segment due to the fact that young workers are less paid as a result of their lower qualification: thus, cheap immigrant workforce makes European employers choose immigrant workers more often, which raises the levels of unemployment among the youth.

3. Automation against the use of manpower

The growing use of automation, computerized and digital technologies is beneficial for the global economy, as it allows significantly improving productiveness and raising the quality of economic output. However, on the other side, the intensification of those tendencies means contracted job vacancies available,

which raises the numbers of unemployed persons and preconditions the need for creating new jobs for them (Gupta and Arora 2007, p. 3).

4. Unequal geographic structure

Major multinational corporations incorporated in developed economies tend to move their production processes to emerging nations, where the labour force is cheaper. As a result, developed countries lose a great part of jobs which could otherwise be created there. On the other hand, the levels of unemployment are still higher in developed countries due to the overall lower economic development and unfavourable conjuncture (Rugraff and Hansen 2011, p. 21). Obviously, this issue has negative consequences for the youth segment of the labour market: young people in EU member states have lower opportunities to become employed, even when speaking of low-skilled work.

5. Violation of human rights in emerging economies

The labour market of emerging economies is characterized by a high degree of violation of human rights, which can be observed on the use of child labour, insufficient quality of work condition, excessive work hours, low wages, delayed payments, lack of social guarantees, and so on. This brings inconsistencies in the structure of the labour market around the globe (Nanjunda 2008, p. 77).

6. Problems with labour immobility

As of today, the labour market is characterized by growing immobility, which is due to the population's focus on a limited number of markets for employment. Often, people are reluctant to obtain another qualification and seek employment in another sector, which brings major problems to the global economy (Banerji 2014b, pp. 7-12). As has been stated earlier in this thesis, the youth is overall more flexible compared to adult population. However, at the same time, a prevalent tendency as of today is that young people tend to focus their attention on finding employment in the most highly-paid sectors, which is a major problems for the youth labour market segment.

Therefore, as can be seen from the information above, the labour market is vulnerable to a great number of threats and issues. The previous findings of this

thesis also confirm that in crisis periods, such issues only tend to become greater, thus bringing major damage to the economy.

2.4 2008 Global Crisis and its Impact on the Labour Market

The 2008 global financial and economic crisis started from the real estate market of the United States, and thereafter transferred onto all countries around the world. The 2008 global crisis revealed the weaknesses of the global financial system. Due to the existence of the so-called "bubble" in the financial market, banks were unable to repay their loans to each other on the international scale, and this caused a range of bankruptcies of financial institutions all over the world. Due the collapse of the global financial "bubble", the real economic sector lost its funding to a large extent, and this preconditioned the subsequent major recession on the international scale. The effects of the global crisis persisted for several years, and the recovery from the crisis was painful and required significant efforts through modified economic policies on the part of states (Hacioğlu et al. 2016, pp. 65-66).

Within the framework of this thesis, it is worth focusing more in detail on the effects which the 2008 global crisis had on the labour market. These effects will be evaluated more in detail below.

Figure 1. Year-on-year percentage change in employment in the EU, in %, 2008–2010
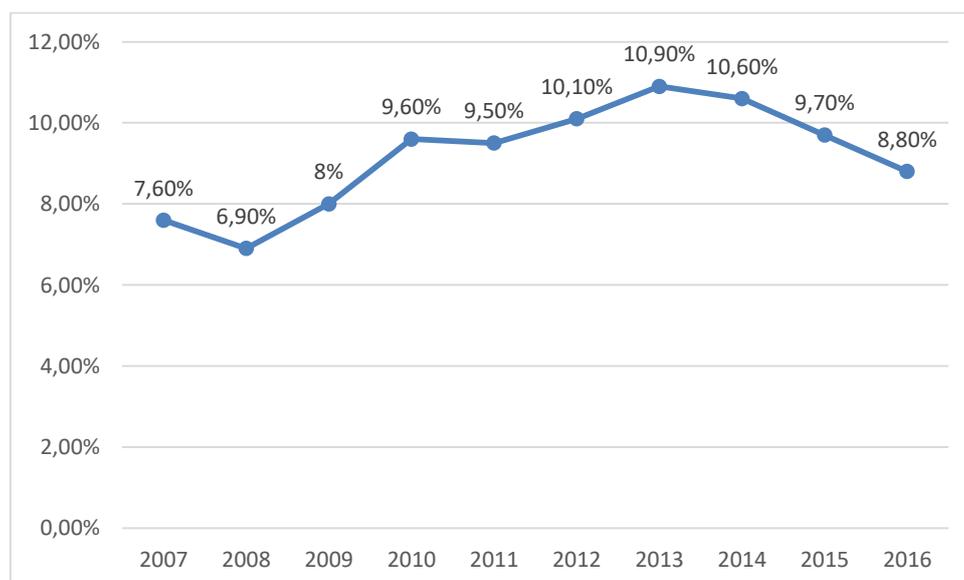
Source: Eurostat 2017

The chart above illustrates the effects of the global financial and economic crisis on the pace of changes in employment rates in the EU. As can be seen clearly from the chart, after the onset of the crisis in 2008, there was a major decrease in the dynamics of employment rates in the European Union. While the total unemployment rate in the EU had been 6.9% in 2008, it grew to 8% in 2009 and to 9.6% in 2010. As the chart illustrates, the situation has not yet returned to the pre-crisis level, even though there has been an improvement in the unemployment rates across the EU in recent years.

The dip which can be seen in the chart illustrates how the global crisis affected employment in the EU, and how negative its effects were in that context. Therefore, this graph is important for this research, as it illustrates the actual impact which the global crisis had on employment in the EU of which Italy makes a part.

When investigating the onset of the global financial and economic crisis in the context of the labour market, it is worth citing Eichhorst (2010, p. 6) who states that "*To the first quarter of 2010, employment in 30 per cent of the advanced G20 countries and 40 per cent of the emerging G20 countries continued to be affected by the crisis. What is more, two years after the onset of the crisis, only 1 advanced country and 8 emerging ones has fully recovered pre-crisis employment levels*."

This proves the previous findings of this chapter, and confirms the negative impact of the global crisis on the labour market of the world's advanced economies.

However, in those terms, only the quantitative effects of unemployment are described. Banerji (2014a, p. 18) emphasizes that in addition to a substantial surge in unemployment rates, countries around the world suffered from qualitative deterioration in the conditions of work. Namely, major adverse effects of the global crisis in those terms included decreasing wages, decreasing work hours where wages remained the same, and so on.

Figure 2. Variation of real GDP and total employment in selected advanced G20 and EU countries since the onset of the crisis
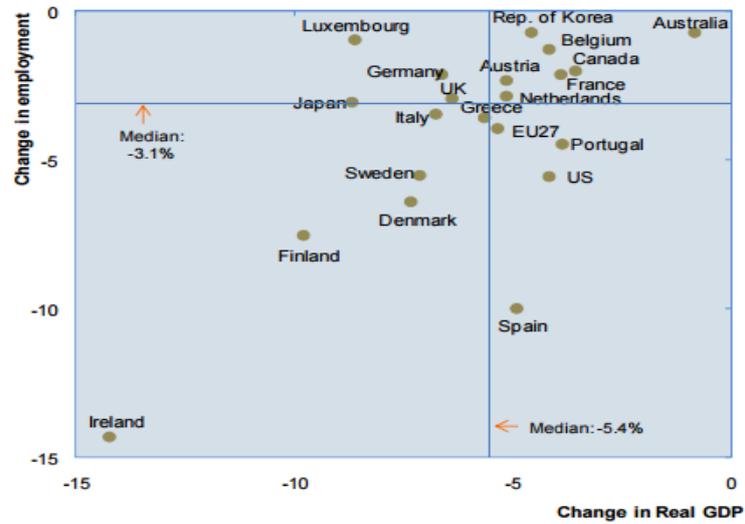
Source: Eichhorst 2010, p. 10

As can be seen from the chart above, the median decrease in employment rates by 3.1% in advanced G20 and EU economies in 2008-Q1 2010 coincided with the median 5.4% decrease in those countries GDP rates. Moreover, as the charter, suggests, this correlation was quite tight for most countries. This suggests that during crisis periods, there is a great interdependence between dropping employment and dropping GDP.

Figure 3. Variation of real GDP and total employment in selected emerging G20 and EU countries since the onset of the crisis
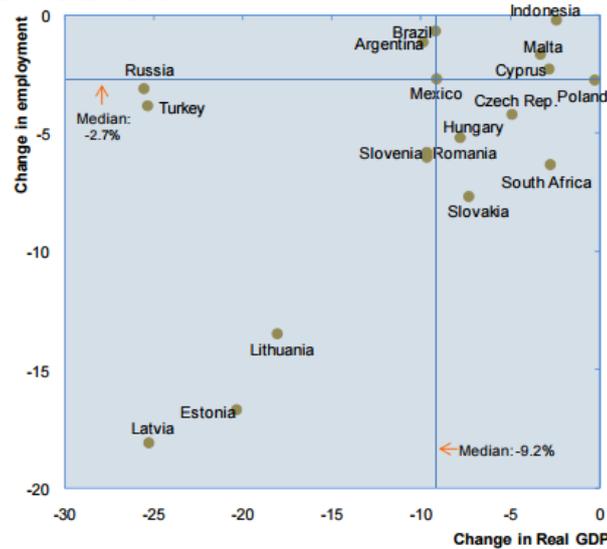
Source: Eichhorst 2010, p. 10

As for emerging G20 and EU countries, there is a certain shift compared to advanced economies. Thus, the media decrease in employment in 2008-Q1 2010 made up 2.7%, while the median decrease in GDP was as much as 9.2%.

In addition to the findings noted above, Banerji (2014a, p. 18) adds that "*the responsiveness of employment growth to changes in GDP growth increased during the crisis, leading simple projections to understate the extent of employment loss during the crisis.*" This finding is important in the context of this research, as it illustrates that the correlation between GDP and unemployment dynamics tends to become greater in the times of crisis.

Figures 3 and 4 above are important for this thesis, as they illustrate the correlations between GDP growth and total employment during the crisis period in the EU member states, comparing them with other developed and emerging economies.

Now, it is worth investigating a bit more closely the impact of the crisis on the labour market of the EU.

Figure 4. Developments in employment, unemployment and forms of non-standard employment over 2000-2010, EU27 averages
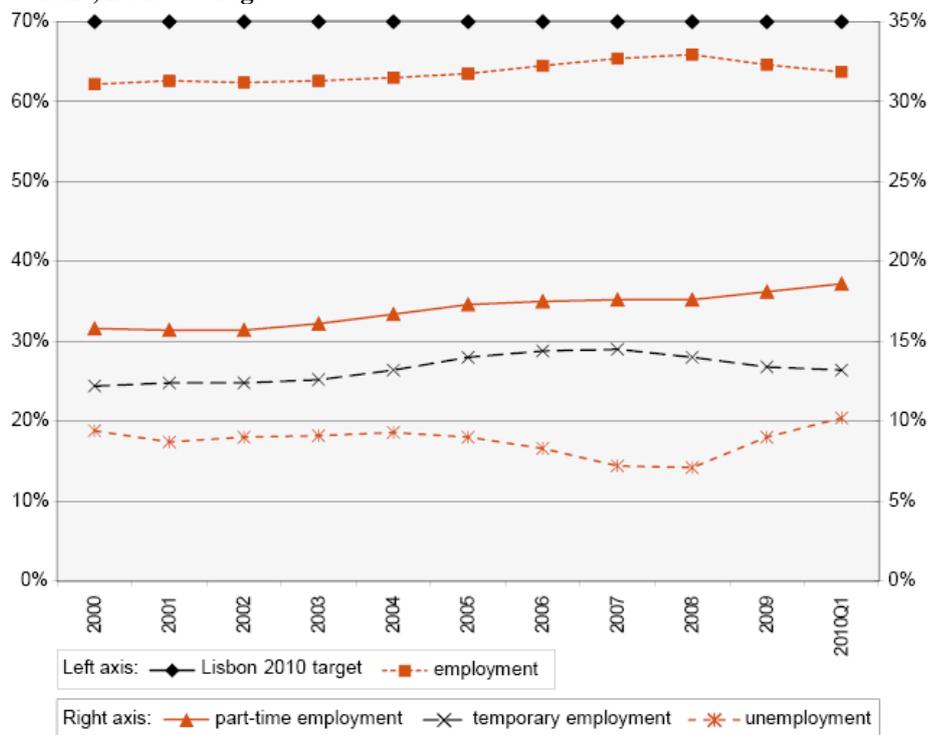
Source: European Social Watch 2010

The graph above is required for this research, as it shows patterns in different forms of unemployment in the European Union during the crisis, and allows understanding how those patterns developed. As can be seen from the figure above, for the EU member states, there was a considerable surge in the rate of unemployment after 2008, as the total unemployment rate exceeded 10% for the first time. Consequently, the employment rate decreased too, and was far beyond the Lisbon target of 35%. Another important tendency to note here is that the 2008 crisis gave a major impetus to the growing part-time employment. However, this tendency should not be considered positive. Banerji (2014a, p. 18) explains it as one of the forms of crisis in the labour market, when companies were forced to offer their employees only part-time job, and thus smaller earnings.

Figure 5. Unemployment rates – Impacts of the crisis
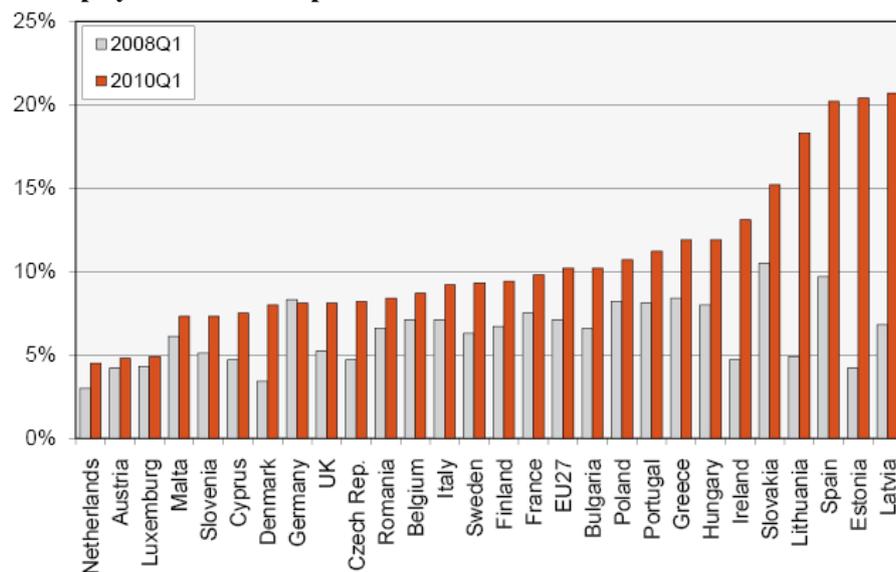
Source: European Social Watch 2010

Figure 6 above is important for this thesis as it illustrates how different EU member states performed in terms of their unemployment rates during the crisis. Thus, as can be seen from the figure above, total unemployment grew almost in all states of the European Union, and its sharpest growth was observed in Estonia (over 16 percentage points), Lithuania (over 14 p.p.), Latvia (over 13 p.p.), and Spain (over 10 p.p.) In those terms, Italy performed better than moderately, with an

unemployment growth of 2 p.p. since the onset of the crisis. However, the total unemployment level in Italy by Q1 2010 was quite high due to high pre-crisis levels.

Figure 6. Unemployment rates by age group compared to overall unemployment rates, 2010Q1
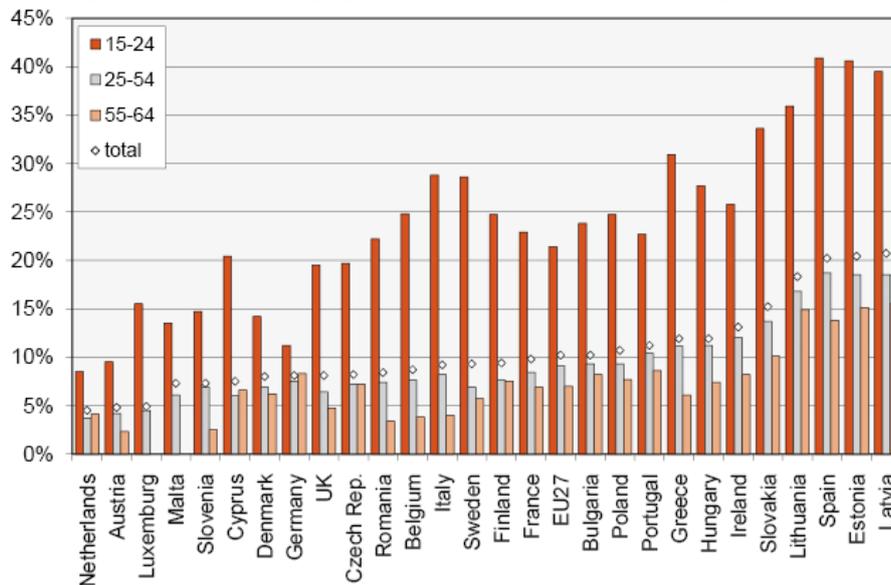
Also, when comparing the rates of unemployment in the EU member states in Q1 2010 in the breakdown by different age groups, it can be observed that it was dominated totally by unemployment among the youngest age group (15-24 years old), which is true for absolutely all states. In countries where the labour market was affected most by the crisis, the total rates of unemployment among the youth grew up to or even above 40%. Even in countries such as Luxembrourg or the Netherlands, unemployment among the youth still remained significantly higher compared to other age groups.

This graph is important as it illustrates how youth unemployment changed in the European Union during the crisis. Particularly, it can be seen from the chart that Italy performed very bad on the youth segment of its labour market, having the 7th higher absolute youth unemployment rate in the EU by Q1 2010. This situation will be investigated more in detail later in this thesis.

Here, it is worth outlining this situation more in detail. Banerji (2014b, pp. 7-12) emphasizes two important aspects. Thus, on the one hand, the global crisis

indeed gave an impetus to a major growth in youth unemployment. On the other hand, however, the more rapid growth of youth unemployment is due not only to the effects of the crisis, but also to the negative structural condition of the youth labour market formed before the crisis. Thus, Banerji (2014b, pp. 7-12) states that the great surge in youth unemployment in the EU was due to the following factors:

- the youth is generally characterized by lower education compare to adults. The share of people without secondary and tertiary education is higher. As a result, in the conditions of growing unemployment, employers preferred firing young people first;

- the youth is more mobile, and therefore more often accepts part-time contracts, which was the case of the 2008 global crisis;

- the youth tends to be more concentrated compared to the adults: as of 2008, 63% of the young people in the EU were working in three sectors only;

- the youth tends to be willing more to obtain better working conditions, and any decrease in the current quality of work (which occurred during the crisis) may provoke young people's desire for dismissal and for seeking a better job;

- during the crisis, companies reduced sharply their expenditures for employee training and professional development. In those conditions, the effectiveness of youth employment dropped, as young people required more thorough training. Therefore, employment shifted more toward adults.

The findings above are also confirmed by the Stationery Office editorial (2014, p. 18) who emphasize that the crisis aggravated those factors, and therefore led to the uncontrolled growth of youth unemployment.

Now, it is worth analyzing more in detail the impact of the global crisis on Italy and its labour market.   Prior to investigating in detail the impact of the 2008 global financial and economic crisis on Italy's labour market, and namely on its youth segment, it is worth first providing an overview of the general effects which the global crisis had on the Italian economy, as this is required in order to gather the preliminary information before testing the interdependence between Italy's economic growth and the country's level of youth unemployment.

Figure 7. Italy's GDP, PPP (current international $ billion), in 2002-2015
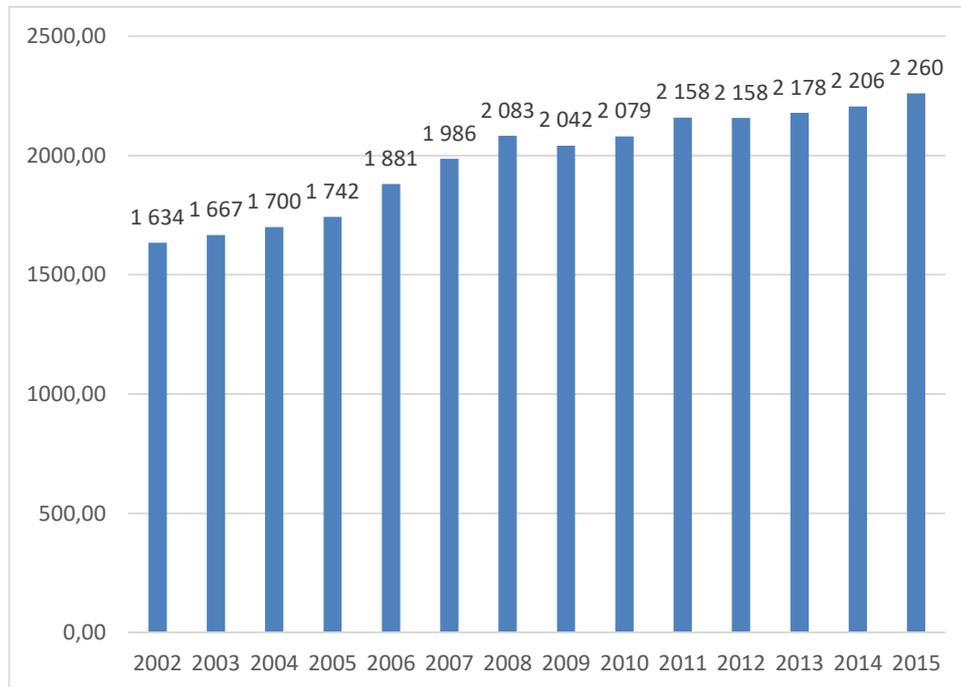

Source: World Bank 2017

As can be seen from the figure above, the absolute GDP by PPP values in Italy had been growing prior to 2008. However with the advent of the crisis, there was a considerable decrease in Italy's gross domestic product which occurred in 2009. Also, according to other methodologies, GDP decreased in 2008 as well (World Bank 2017). Those effects are linked directly with the global financial and economic crisis and the recession of the Italian economy (Di Quirico 2010, p. 3).

The findings presented in the graph above will be used later in this thesis for testing the dependence between unemployment and GDP on the case study of Italy.

The negative dynamics of Italy's GDP testified not only negative quantitative tendencies in terms of the country's economic growth, but also highlighted major negative structural effects in different aspects of Italy's economic life. Thus, Di Quirico (2010, p. 7) emphasizes that Italy's dropping GDP values in the time of the 2008 global crisis "*increased the ratios of debt and deficit to GDP, which meant breaching the parameters of the Growth and Stability Pact stipulated as part of*

European Monetary Union." Also, Coletto (2010) states that the decreasing GDP in Italy during the time of the global crisis correlated significantly with the major dropdown in the domestic sales of products and services produced in Italy, which further aggravated the negative economic effects associated with the crisis for the country.

Figure 8. Italy's GDP per capita (current US$) in 2002-2015
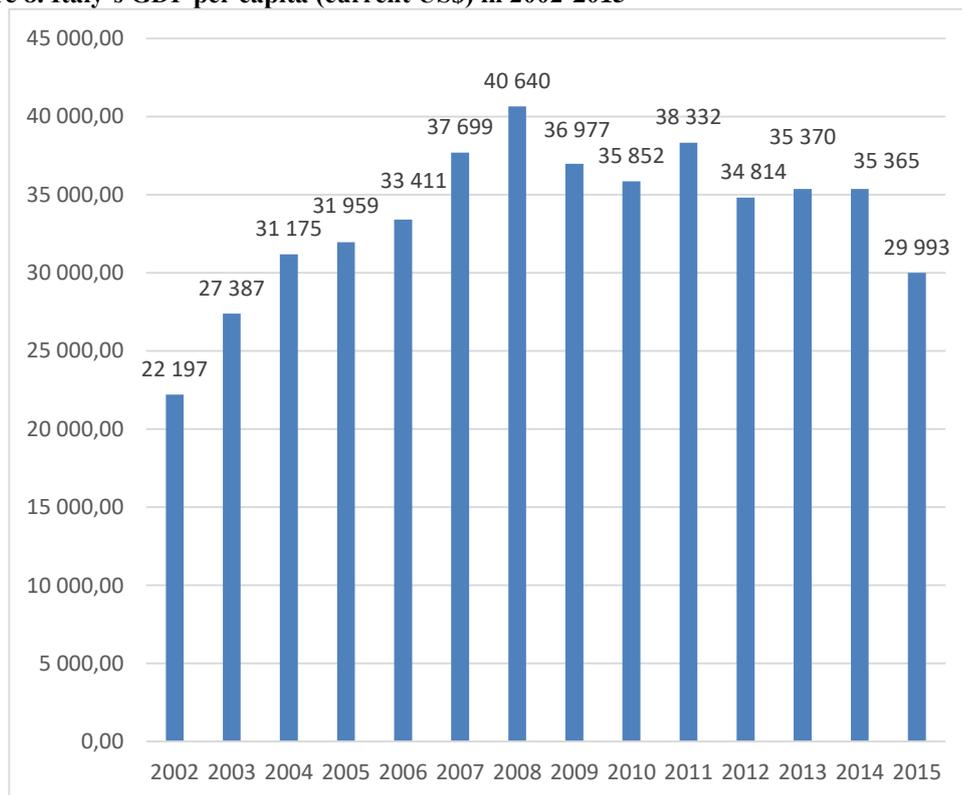
Source: World Bank 2017

The chart above shows that the tendencies in terms of Italy's GDP per capita were in line with the absolute GDP value dynamics during the crisis. As the figure illustrates, the country's GDP per capita had been growing prior to 2008, but thereafter dropped considerably. Moreover, after the recovery from the global crisis, the dynamics of those values still remained unequal, and in 2015, the country showed its lowest GDP per capita value for 10 years.

This chart is important for the thesis as it illustrates how the level of the population's wealth in Italy was affected by the global crisis.

Figure 9. Italy's exports and imports of goods and services (BoP, current US$ billion) in 2002-2015
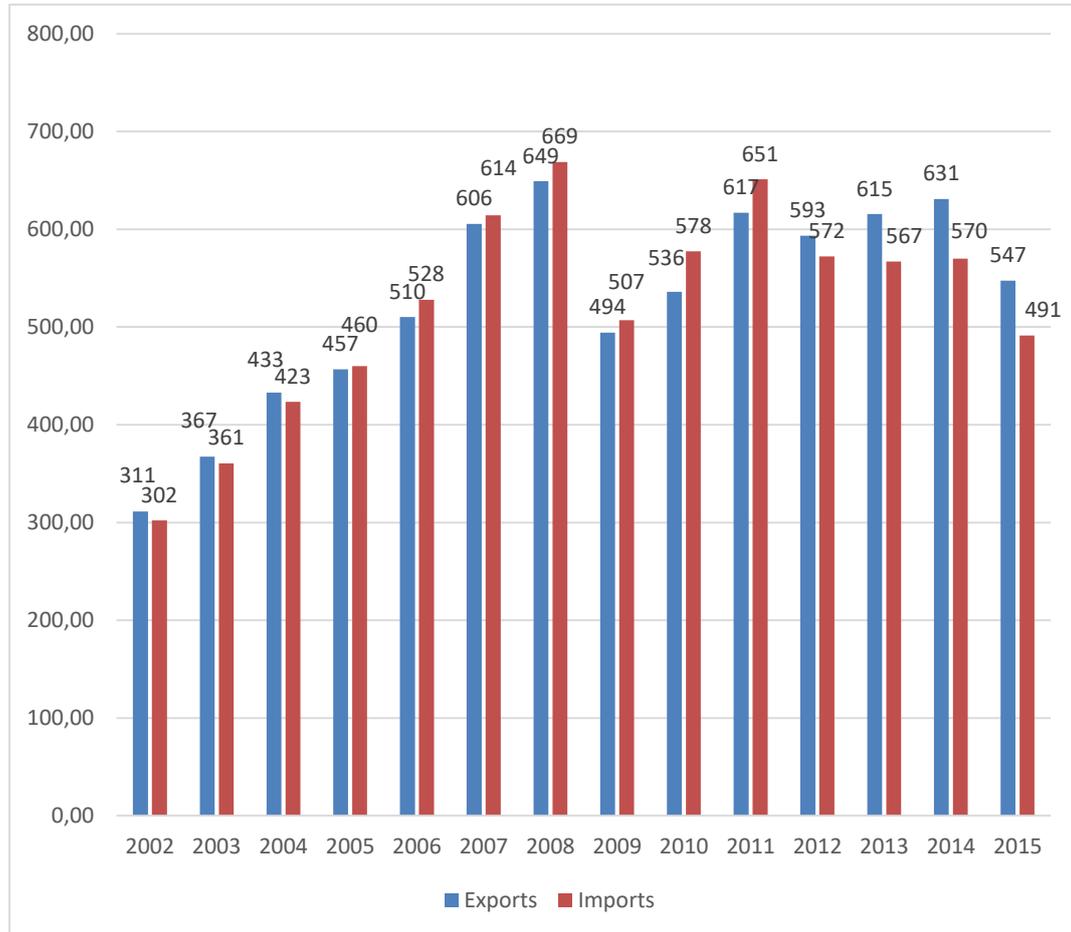
Source: World Bank 2017

The tendencies illustrated in the chart above further prove the findings regarding the economic downturn in Italy during the time of the 2008 global crisis. As can be seen from the figure, during 2008-2009, a major dropdown occurred in terms of both Italy's exports and imports. This testified that Italy's economic activity fell significantly. Also, it is worth noting that while Italy's exports dropped by almost 31%, the country's imports decreased by over 24%. The greater decrease in exports compared to imports testified Italy's decreasing effectiveness in international trade and contracted proceeds from such trade.

Therefore, the chart above further confirms that the global crisis affected in a major way the Italian economy, which is important to bear in mind prior to investigating the situation in the Italian labour market.

Now, let's proceed to a more detailed investigation of the effects of the global crisis on the Italian labour market.

2.5 Impact of the Global Crisis on the Labour Market: the Case of Italy

In this chapter, an evaluation of the situation in the Italian labour market caused by the effects of the 2008 global financial and economic crisis will be presented. Also, for the purpose of providing relevant comparison, data on the situation of the labour market in developed EU economies, and namely in France, Germany, and the United Kingdom, will be outlined too. The situation in the youth segment of the Italian labour will be put into focus in particular.

The choice of countries for comparison with Italy is due to the fact that Germany, the UK and France are developed states in the EU, and Italy strives to achieve similar economic results. It is thus important to compare those countries' performance in terms of unemployment.

Figure 10. Italy's total unemployment (% of total labour force) in 2002-2017, by quarters
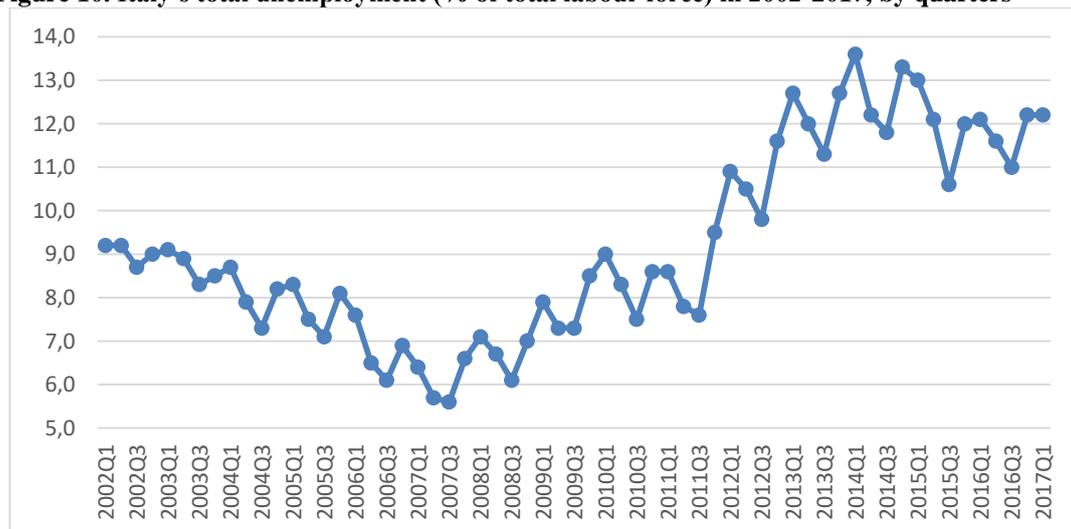
Source: Eurostat 2017

The figure above illustrates that Italy's total unemployment had started growing significantly during the crisis, and this growth in the country's unemployment stopped only by 2015. Coletto (2010) emphasizes that the growing unemployment in Italy during the period of the global crisis illustrates the major structural problems which existed in the Italian economy back then, and the lack of the government's ability to address those issues in an effective manner.

This chart is important for the thesis, as it allows understanding the general situation in the Italian labour market prior to proceeding to the investigation of its youth segment.

Figure 11. Unemployment, total (% of total labour force) (national estimate), in Italy and selected EU member states in 2002-2015
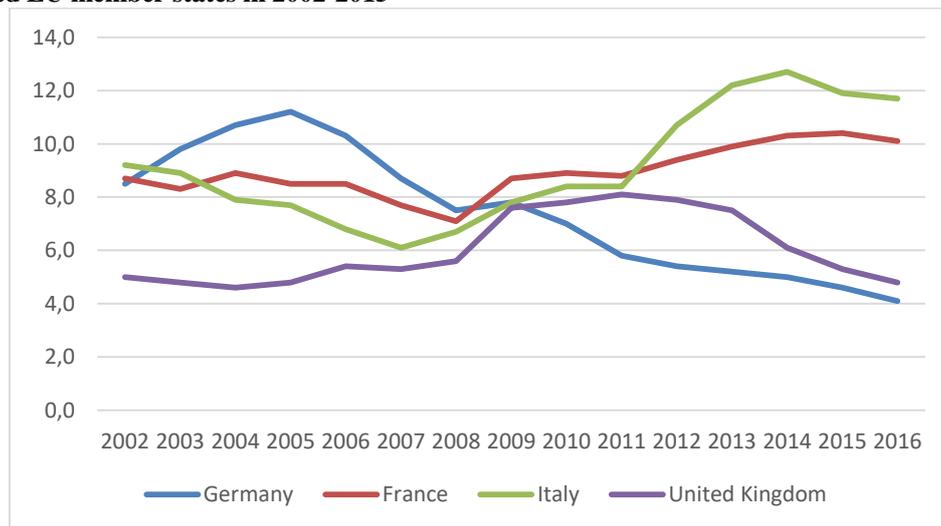
Source: Eurostat 2017

Figure 11 above is important for this thesis in order to see Italy's general trends in unemployment against the EU's major states in terms of economic development prior to proceeding to a detailed investigation of trends in the labour market's youth segment. As can be seen from the information provided in the chart above, for Italy, the global crisis caused a significant increase in the total unemployment rate. The reasons for this situation have been explained earlier in this thesis. At this point, it is worth noting that the total growth in Italy's unemployment

amounted to 0.64 percentage points in 2008 compared to 2007. In 2009, this value further grew by 1.03.

Similar tendencies during this time period were also observed in France and the United Kingdom. In France, the total unemployment rate had dropped by 0.6 p.p. in 2008, but thereafter grew significantly in 2009, achieving 8.74%. In the UK, unemployment grew by 2.28 p.p. within 2 years.

The only exception in those terms was Germany, where the global crisis had no major effect on the country's unemployment. In the long-term perspective, Germany's unemployment only continued decreasing.

Therefore, in general, it can be stated that for Italy, as for most EU member states, the crisis contributed to the rapidly growing rates of unemployment. However, while those tendencies were overcome by the UK within the three-year perspective and were more controlled in France, Italy was unable to implement effective policies, and as a result, the negative trends in the country's labour market persisted even after recovery.

In addition to the above data for Italy, it is worth citing Coletto (2010) who claims the following: "*At territorial level, the decrease in employment has mainly concerned the south of the country (194,000 fewer workers) and northern Italy (-61,000 workers). At sectoral level, compared with 2008, employment has decreased most in industry (-4.3%) and services (-3.7%).*"

Given the differences in the effects of the global crisis for unemployment in Italy across different regions and economic sectors, it can be further confirmed that the crisis had major negative effects for the Italian labour market.

The growing unemployment among people with advanced education further highlighted overall negative tendencies in the Italian labour market, as it marked the outflow of highly qualified workforce from the Italian economy due to the overall recession in the country's innovative sectors (Coletto 2010).

Figure 12. Unemployment, youth total (% of total labour force ages 15-24) (national estimate), in Italy and selected EU member states in 2002-2016
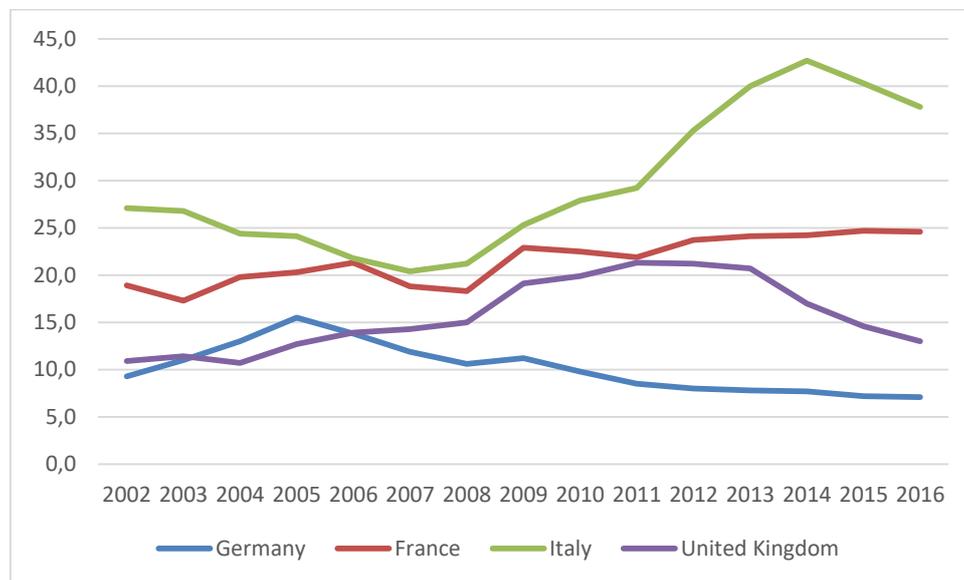
Figure 12 above is important for this thesis, as it provides essential data for the subsequent practical research, and namely data on Italian youth unemployment. As can be seen from the chart, the situation with youth unemployment was the worst in Italy compared to the other EU member states analyzed. While the country's youth employment had already been high at 20.36% prior to the onset of the global crisis, within the two first years of the crisis, it grew to 25.34%. Moreover, it is worth noting that the uncontrolled growth of youth unemployment in Italy further continued after the recovery from the crisis.

As of today, the total rate of youth unemployment in Italy is almost twice as high as the average figure for the Eurozone. As Bird (2015) suggests, there are several main reasons to it. Thus, first, there are no effective government policies to promote youth employment. Companies prefer hiring experienced specialists due to which young people do not have sufficient opportunities to find a job. Next, many young people in Italy choose university education instead of work, and as a result, are counted as unemployed. Finally, young people in Italy tend to prefer working on

a part-time basis or under temporary contracts, which also has its impact on the overall level of youth unemployment.

Now, it is worth investigating youth unemployment in the breakdown by genders. Figures 14 and 15 below are important for this thesis to understand the particular patterns in youth unemployment in Italy, and to reveal whether there are any major discrepancies in such trends for male and female citizens.

Figure 13. Unemployment, youth male (% of male labour force ages 15-24) (national estimate), in Italy and selected EU member states in 2002-2016
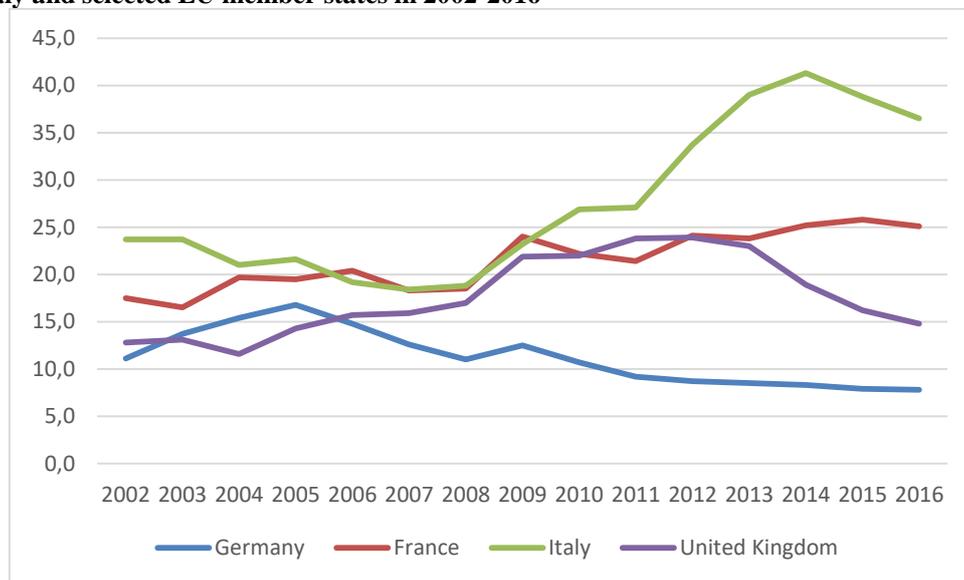

Source: Eurostat 2017

As can be seen from the figure above, the overall pattern of male youth unemployment in Italy and the other EU member states analyzed was the same during the crisis period.

Figure 14. Unemployment, youth female (% of male labour force ages 15-24) (national estimate), in Italy and selected EU member states in 2002-2016
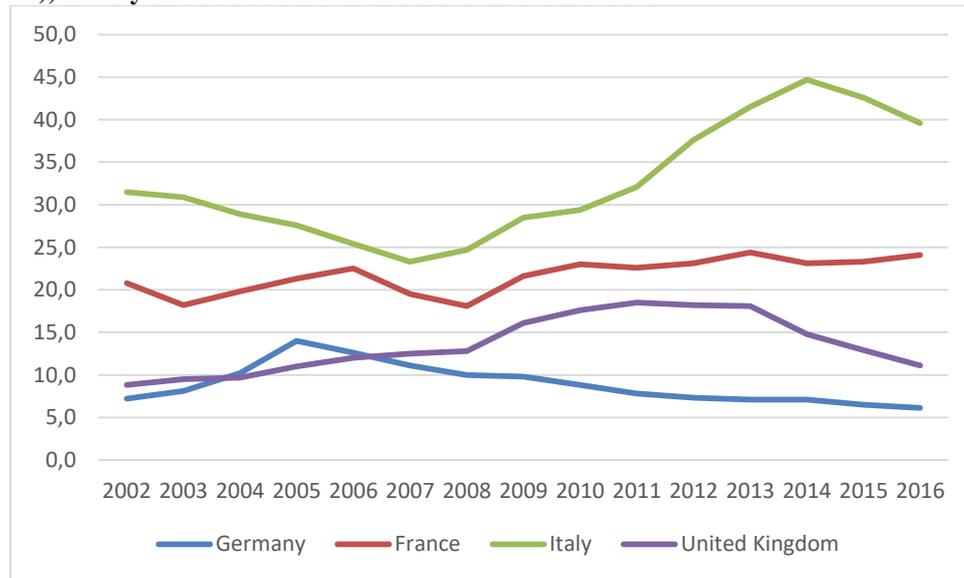
The general pattern of female youth unemployment in Italy and the other EU member stated investigated was the same during the time of the crisis as well. The only fact which should be pointed out is that the total female youth unemployment In Italy is approximately 4 p.p. higher compared to male youth unemployment.

Thus, based on the information investigated in detail above, it can be stated that the crisis fueled negative tendencies in the Italian labour market, and across most indicators, Italy performed weaker compared to France, Germany, and the UK.

2.6 Indicators of the Labour Market

When investigating measurement indicators of the labour market, it is worth noting that the current international practice recognizes a wide range of different indicators which fit for the effective evaluation of the labour market, its capacity, dynamics and opportunities for the subsequent growth. Based on the methodology of the International Labour Organization (ILO), there are 17 key indicators which characterize in detail the labour market (International Labour Organization 2016). Those indicators are presented in detail below.

1. Labour force participation rate

The labour force participation rate is a labour market indicator which is calculated as the share of persons in a country's total population who participate in its labour force. People participating in labour force include not only employed persons, but also unemployed people who are seeking a job. Generally, the labour force participation rate tends to go in line with the business cycle: economic growth incites greater labour force participation, while economic downfalls provoke lesser labour force participation. In the ILO's methodology, this ratio is calculated for people aged 15+. Also, it should be noted that the labour force participation can be calculated separately for male and female population, particular age groups, different economic sectors, and so on, which allows investigating in detail its condition in particular target segments (Tiffen and Gittins 2009, p. 67).

2. Unemployment rate

The unemployment rate can be defined as "*the number of unemployed people who are available for work as a percentage of the working-age population.*" This indicator is the one used most widely around the globe in order to assess the condition of a country's labour market. The unemployment rate can be calculated for separate age and gender groups, economic sectors, and so on (Walsh et al. 2000, p. 330).

It is worth noting that the best situation for a country is when its actual unemployment rate amounts precisely to its natural unemployment. However, most often, there is no such balance. During recessionary gaps, the unemployment rate tends to be higher than the natural unemployment rate, and on the contrary, during inflationary gaps, the unemployment rate tends to be lower than the natural unemployment rate (Arnold 2007, p. 152).

3. Youth unemployment

This statistical indicator shows the actual unemployment rate among the population aged 15 to 24 years old. Unemployment among the population may fluctuate significantly, as young people tend to change their jobs more often, seeking the best earnings, career growth opportunities, etc. Eliminating or minimizing the impact of negative trends in youth employment might help countries achieve the best

effects for the minimization of the overall unemployment in the long-term perspective (Begg 2012, p. 10).

4. Long-term unemployment

This labour market indicator includes two main ratios. The first ratio shows the share of people who have been unemployed but wishing to be employed and seeking employment for over 1 year in the total structure of unemployed persons. The second ratio illustrates the durations of unemployment among particular gender and age groups, across different economic sectors, and so on. Long-term unemployment tends to be higher in those sector where workforce turnover is greater. Also, long-term unemployment tends to be higher in those economic sectors where the employment indicator tends to be either contracting or expanding (Doogan 2013, p. 196).

Therefore, as can be seen from the information presented above, there are different labour market indicators and ratios available to researchers for evaluating the actual condition and development of the labour market across a variety of different inherent aspects.

Taking those facts into consideration, the next chapter will be dedicated to the current problems of the labour market.

In the practical part of the thesis, the focus will be put on the investigation of Italy's case study in terms of the effects which the 2008 global financial and economic crisis had on the Italian labour market, and namely on its youth segment.

3 Practical Part

Now, based on the information outlined previously, it is worth developing an empirical model for analyzing the actual interdependence between Italy's economic output and the situation' with the country's youth unemployment. Here, again, a comparison will be held between Italy and three other developed states of the EU, namely Germany, the UK, and France. The choice of those countries is due to the fact that Italy seeks to achieve their level of economic development, and therefore their comparative analysis could provide valuable data pertaining to Italy's governance of its unemployment.

3.1 Literature Review

Prior to developing an empirical model for analyzing the factors which affect most Italian youth unemployment, it is worth investigating literature dealing with this issue and revealing which factors can be used effectively within the empirical model for this thesis.

Lam (2014, p. 7) uses GDP as an independent variable for investigating changes in youth unemployment. GDP can be used effectively as an independent variable for analyzing dynamics of youth unemployment as GDP illustrates the overall trends in a country's economic growth. Thus, the comparison of youth unemployment with GDP dynamics might be illustrative of the extent to which youth unemployment is dependent on the investigated country's overall economic performance.

Another confirmation of the effectiveness of the use of GDP in models destined to evaluate the factors driving the causes and consequences of youth unemployment can be found in Mourelo (2013, pp. 9-10). Although the author focuses on the youth labour market in Kenya, the area of her interest is similar to the one which is of major importance within this thesis. The author uses a cohort-based regression analysis model within which GDP serves as the main independent variable

destined to track the changes in the youth labour market's dynamics (where the main dependent variable is total youth unemployment).

The appropriateness of GDP for the sake of our research can also be justified by the arguments provided by Kitov (2009, pp. 6-11). On the example of France, the researcher shows that the level of GDP correlates well with the overall dynamics of unemployment. As the author puts is, "*GDP growth is completely controlled by the demand of growing labour force, because the excess is always accommodated in a developed economy through employment growth, which causes inflation. The latter serves as a mechanism which effectively returns personal income distribution, normalized to total population and nominal GDP per capita growth, in the economy to its original shape.*" The generalized relationship between GDP and unemployment is seen by Kitov as one of the major correlations within the research of unemployment. At the same time, Kitov does not deny the possible benefits of including various inflation parameters in regression models dedicated to inflation. However, he claims that the inclusion of inflation might bring important deviations, and therefore working with the indicators of inflation, it is worth comparing actual and predicted inflation against each other, as a reflection of the viability of economic agents' expectation.

Furthermore, investigating the correlation between unemployment and GDP in the Eurozone and non-Eurozone EU member states, Axman and Vicini (2017, p. 7) stated that the best measure for this sake is GDP by purchasing power parity: "*GDP per capita for the 27 countries in the EU and EA, measured by Purchasing Power Parity in current international dollars, is also an important variable. This is essential to look at since different countries will have different economic performance and productivity. One way to measure this economic performance is GDP per capita. According to Okun (1962) and his law on the relationship between GDP and unemployment, a low or negative growth in GDP per capita is expected to increase the unemployment rate, and vice versa.*" Therefore, based on this explanation, it can be believed appropriate for us to use GDP by PPP within the framework of this research taking into account the fact that we investigate Italy in comparison with other EU member states, and take into consideration specifically the

impact of the 2008 global crisis. GDP by PPP therefore seems to be the most appropriate variable to be used for testing correlation with youth unemployment.

Griffith (2015, p. 2) investigates the correlation between minimum wages and youth unemployment, and proves through a linear analysis of cross-country data that the link between minimum wages and youth unemployment may indeed be quite firm.

This can be explained logically by the fact that the youth is often seeking work for the first time, and thus is ready to accept conditions, namely in terms of wages, worse than the ones which would be accepted by the older population. Therefore, this indicator could be potentially used for the sake of this research. However, a major problem is that Italy does not have minimum wages established on the legislative level, and are coordinated in each particular sector within collective agreements (US Department of State 2016, p. 22). As a result, the use of minimum wages is inappropriate for this thesis.

Mojsoska-Blazevski et al. (2016, pp. 13-14) use another approach and state: "*The determinants of the unemployment spell reduce to individual characteristics, socioeconomic condition (or the household characteristics); and work preferences and attitudes.*" The authors' regression model covers a time span of 3 years and a wide range of economic and social variables. According to the researchers, the inclusion of social variables may be important in the context of the youth labour market, as the social conditions of the youth may be often less stable compared to adult population, and hence the level of social stability might be significantly lower as well, specifically during the times when crisis events persist.

Collins (2009, p. 9) analyzes unemployment as a dependent variable affected by GDP, foreign trade balance and public debt. Public has a direct linkage with unemployment (the higher the debt, the greater the unemployment rate). The combination of those factors allows building up the most effective cause-effect relationship between unemployment and economic factors characterizing a country's performance.

Also, it should be noted that there are other indicators which may be used in research pertaining to youth unemployment. For instance, as Stampini and Verdier-

Chouchane (2011, pp. 11-12) note, such indicators may include the degree of literacy, higher education, vocational training, structure of employment, and so on. The particular choice of variable to be used in each specific analysis depends on the goals of the research and the relevance of their use according to the author.

Further investigating government debt as a potential variable to be used in our regression model, it is worth citing Holden and Sparrman (2016, p. 1) who state that "*More recently, increasing public debt and rising default premia on sovereign debt have led to substantial fiscal tightening in many countries. At the same time, unemployment has soared in many OECD countries.*" The authors also state that public debt can affect unemployment indirectly: "*the debt to GDP ratio, may affect unemployment through other channels, such as the effect on expected future taxes.*"

Those assumptions are also confirmed by a study by Kurečić and Kokotović (2016, p. 1): "*The rise of the public debt-to-GDP ratio in the aftermath of the 2008 crisis coincides with the rise of several other negative macroeconomic indicators. These are indicators such as: inflation, the unemployment rate and primary government budget deficit.*" The authors use public debt to GDP in their regression analysis model in order to make the indicator comparable among other countries. Therefore, this variable can be used in our study as well as an independent variable affecting the ultimate level of youth unemployment.

As regards the impact of foreign trade on unemployment, Mitra (2007, pp. 2-3) argues that: "*Trade in a two-sector Ricardian model results in an increase in the value of the marginal product of labour in one of the sectors (the export sector) due to an increase in the domestic relative price of the good produced in that sector. Since the other sector (the import-competing sector), where the marginal product of labour would have been lower, cannot survive trade liberalization, the economywide value of marginal product of labour also goes up. There is more investment in job search and the posting of jobs and we get a reduction in unemployment.*" Taking into account this fact, we should use foreign trade as a separate independent variable, as it might be illustrative of the changes in Italian youth unemployment, and represent effectively the country's overall picture with youth unemployment dynamics together with the two other chosen variables.

Therefore, it can be stated that apart from minimum wages, other indicators which have been revealed to be used by researchers for investigating which factors affect youth unemployment can be applied effectively within the empirical model for Italy's case study in this thesis.

3.2 Development of Empirical Model

Given the previous findings of this thesis, it is now worth investigating to which extent the youth unemployment in Italy correlated with the country's economic results, which is important for the purpose of evaluating how the 2008 crisis contributed to the unemployment of the Italian youth.

For this sake, the total youth unemployment rate (in %) will be considered as the dependent variable (y variable). At the same time, the independent variables will be the following:

x1 variable: gross domestic product (GDP) by purchasing power parity as the basic indicator of countries' economic development. This indicator reveals the population's purchasing power through the latter's equilibrium with the national currency exchange rate, and thus is a strong indicator of national economic performance;

x2 variable: foreign trade balance. This indicator is calculated as the difference between exports and imports, and thus illustrates to which extent a country is effective in its foreign trade;

x3 variable: central government debt as a percentage of GDP.

Based on the information outlined in Kitov (2009, pp. 6-11), Axman and Vicini (2017, p. 7) and Lam (2014, p. 7) on the use of GDP in regression models analyzing unemployment, the choice of GDP as a factor affecting unemployment can be justified as follows. Growing GDP figures testify that the economy is growing, which means that local manufacturers might require greater human resources to cover their production needs. As a result, this might contribute to decreasing unemployment rates. On the contrary, during economic stagnation cycles, production is decreasing, and manufacturers tend to free the available labour resources, which

contributes to growing unemployment. As for net trade balance, it should be noted that when it is growing due to export growth, this situation indicates positive economic dynamics for the state. Therefore, companies might require additional resources to add up to their production and export opportunities, which in its turn contributes to decreasing unemployment. As for the debt of the government, it can be said that increased borrowed funding might lead to positive economic growth, but excessive dependence on it might lead to major economic problems, and thus to growing unemployment rates.

The interdependence between youth unemployment and the above three independent variables should reveal whether there is any direct interconnection between Italy's GDP level and the country's youth unemployment. In addition to this, the same kind of linear regression analysis will be run for France, Germany, and the United Kingdom, so as to reveal whether the situation in them anyhow differs in that context from the situation in Italy.

In order to maximize the reliability of the linear regression model, data for GDP and total youth unemployment will be taken for 26 years (from 1990 to 2015). The initial data for the linear regression model for the case study of Italy's youth labour market are presented in the table below.

The initial data for the linear regression analysis for France, Germany, and the United Kingdom are presented in Annex 1, 2 and 3 to this thesis, respectively.

Given the information and assumptions outlined above, in the next chapter of the thesis, the empirical analysis pertaining to this research will be run, and its results will be interpreted.

3.3 Empirical Analysis of the Italian Youth Labour Market

First off, it is worth running the linear regression analysis for Italy based on the model developed within the previous chapter. For this kind of analysis, Microsoft Excel software will be used.

Table 1. Results of linear regression for Italy (x variable: GDP by PPP (in current USD billion); y variable: total youth unemployment, %)

	Coefficients	Standard Error	t Stat	P-value
Y intercept	-4,970	6,498	-0,765	0,452
GDP	-0,001	0,002	-0,746	0,463
Foreign debt	0,073	0,023	3,128	0,005
Foreign trade	0,343	0,072	4,764	0,000

Source: Own calculations

The information presented in the table and above illustrates the findings of the linear regression analysis for Italy's case study. As can be seen from those data, the R Square value amounts to only 0.802. This means that only slightly over 80% of the dependent variable's variations around the mean can be actually explained by changes in the independent variables. The strong linear relationship between the chosen variables is also confirmed by high Multiple R and Adjusted R-square values.

Taking a look at the P values, it can be stated that for independent variables X2 and X3, the P value is smaller than 0.05, which means that the variables fit the model and explain effectively changes in the Y variable. However, X1 does not fit well the model, and thus affects its reliability in explaining the changes in Y.

Also, we can see that at the given degrees of statistical significance and reliability, each variation in Y by plus one unit is followed by plus 0.073 in X2, plus 0.343 in X3, and -0.001 in X1.

So, based on those findings, it can be stated that the linear regression analysis run proves: changes in youth unemployment in the Italian labour market can be explained well by the empirical model developed within the framework of this thesis. The indicators of foreign trade balance and government debt correlate very well with the rates of youth unemployment, while there is no effective correlation between youth unemployment and GDP in Italy, and so the use of GDP as an independent variable tends to affect the model.

Now, taking into account those facts, it is worth doing the same kind of linear regression analysis for the three other states with which Italy is compared within this

research in order to further validate the findings above. Namely, it is important to run similar analysis for France as a country which is Italy's geographic neighbor and the United Kingdom and Germany as developed states of the EU toward whose standards Italy aspires.

Table 2. Results of linear regression for France (x variable: GDP by PPP (in current USD billion); y variable: total youth unemployment, %)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Y intercept	20,736	2,905	7,139	0,000
GDP	-0,019	0,003	-5,822	0,000
Foreign debt	0,016	0,010	1,639	0,115
Foreign trade	0,531	0,072	7,428	0,000

Source: Own calculations

As can be seen from the table above, the findings for the case study of France are largely the same as for Italy in terms of the empirical model's fit for the research. However, there is an important difference to be noted: for France's youth unemployment correlates well with GDP, but there is a weaker correlation with foreign trade balance.

The table and interpretation for Germany are provided in Annex 4 to the thesis.

Table 3. Results of linear regression for the UK (x variable: GDP by PPP (in current USD billion); y variable: total youth unemployment, %)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Y intercept	12,589	1,763	7,142	0,000
GDP	-0,003	0,001	-2,468	0,022
Foreign debt	-0,056	0,025	-2,274	0,033
Foreign trade	0,149	0,036	4,137	0,000

Source: Own calculations

As can be seen from the table above, the empirical model developed within this research fits rather well the analysis of the United Kingdom's youth

unemployment. The Adjusted R square value is above 0.64, which means that almost 2/3 of the variations in the dependent variable can be explained by variations in the independent variables. The low P values further confirm that the chosen independent variables fit well the developed empirical model.

Therefore, based on the results of linear regression analysis run for Italy and three other developed EU member states, it can be stated that the empirical model developed within the framework of this thesis cannot be used effectively for analyzing the dependence of youth unemployment on GDP, foreign trade balance and government debt for all states. Namely, the model proved to be weak for analyzing those variables for Germany. However, the model indeed showed its effectiveness for the case study of Italy, the UK and France, although with some differences in terms of the correlation between particular variables.

For Italy, the findings of this empirical analysis prove that the model fits well the goals stated and fits well for explaining changes in the country's youth unemployment. There is a particularly high correlation of Italy's youth unemployment with foreign trade and government debt, while the correlation with GDP is rather weak.

Now, let's evaluate the model's correlation. Let's create a multiple correlation model for all data in the table.

Table 4. Multiple correlation model for Italy

	GDP by PPP (current US$ billion)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
GDP by PPP (current US$ billion)	1			
Current account balance (current US$ billion)	-0.286490836	1		
Government debt to GDP, %	0.434530594	0.432072566	1	
Total youth unemployment, %	0.072400269	0.716729571	0.789680025	1

Source: Own calculations

Based on the above table, it can be stated that GDP by PPP doesn't have any correlation dependence on total youth unemployment. Therefore, this indicator will be taken into account when building the regression model. The two other indicators have correlation coefficients of 0.71 and 0.78, which proves a high dependence.

Now, let's consider the interconnection between the other indicators. All indicators in the table have a correlation coefficient of at least 0.85, and so they do not affect each other, and can all be used in the model. Let's assume the model doesn't have the properties of multicollinearity.

Let's build the multiple regression model.

ANOVA

	df	SS	MS	F	Significance F
Regression	2	669,952	334,976	45,147	0,00000001
Residual	23	170,653	7,420		
Total	25	840,605			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-3,409	6,092	-0,560	0,581
GDP	0,083	0,019	4,432	0,000

Foreign debt	0,308	0,054	5,665	0,000

The regression formula is Y = b0 + b1*X1+ b2*X2+ bn*Xn, i.e. in our case: Y=-3,409+X1*0,083+X2*0,308.

This regression formula corresponds with the one stated in the monography of Chatterjee and Hadi (2006) who analysed the regression (dependance) between civil laws amended in the United states on the cost of living for the persons in different regions and locations. Our regression statement and research covers all steps mentioned by Chatterjee and Hadi (2006, pp. 15-16).

The regression coefficient is 0.797, i.e. the accuracy of the model will be approx. 80%. It is worth noting the P-value indicator. The data in the table at a value of over 0.05 will deviate under the null hypothesis, and will be statistically insignificant. The indicators X1 and X2 are statistically significant, as both are significantly lower than 0.05.

Another confirmation of the regression equation's significance is the Fisher's ratio (F). The significance of F is lower than 0.05, and thus the equation is statistically significant.

Let's test the model for autocorrelation under the Durbin-Watson method.

We get that the coefficient DW = 113.081/170.653 = 0.663. Du and Dt are higher than the basic value, which proves autocorrelation in the model.

To confirm the autocorrelation effect, let's calculate the correlation between the residuals.

	Residuals	*Residuals*
Residuals	1	
Residuals	0.636211	1

The significance coefficient will be 4.04, and the critical value for the model under Student's statistic is 1.711. The observed value is higher than the basic one, and thus there is an autocorrelation of the residuals. That means that degree of similarity between a given time series and a lagged version of these values over

successive time intervals. Autocorrelation is positive, which means that there is a direct connection between the change of indicators in the past and in the present. Thus, increase seen in one time series leads to a proportionate increase in the other time series. In other words, in case of the change of macroeconomic indicators which influence youth unemployment in Italy there is a time dependence and according to this connection it can be predicted for the future periods only with the knowledge about the indicators of foreign debt and current account balance.

Let's create a multiple correlation model for all data in the table. Current dollars are taken as a basis of calculation as they allows avoiding the deviations which might exist when constant dollars are used and the value of the dollar is calculated taking into account inflation.

Table 5. Multiple correlation model for France

	GDP by PPP (Current US$)	*Current account balance (current US$ billion)*	*Government debt to GDP, %*	*Total youth unemployment, %*
GDP by PPP (Current US$)	1			
Current account balance (current US$ billion)	0.93839626	1		
Government debt to GDP. %	0.93640357	0.84099306	1	
Total youth unemployment. %	-0.19914130	-0.21402657	0.09756407	1

Source: Own calculations

Based on the table above, we can state that the indicators GDP by PPP, Current account balance and Government debt to GDP do not have any correlation interdependence with total youth unemployment. Therefore, those indicators have a weak influence on the unemployment among young specialists. Also, the correlation model shows that the indicators are equal, and there is an effect of multicollinearity.

Despite the low correlation coefficient, let's build a multiple regression model including all factors.

ANOVA

	df	SS	MS	F	Significance F
Regression	3	218,664	72,888	19,629	0,000
Residual	22	81,692	3,713		
Total	25	300,356			

	Coefficients	Standard Error	t Stat	P-value
Intercept	20,736	2,905	7,139	0,000
GDP	-0,019	0,003	-5,822	0,000
Foreign debt	0,016	0,010	1,639	0,115
Foreign trade	0,531	0,072	7,428	0,000

The regression formula will be Y20,736+X1*-0,019+X2*0,016+X3*0,531.

The regression coefficient is 0.2, i.e. the accuracy of the model will be approx. 70%. It is worth noting the P-value indicator. The data in the table at a value of over 0.05 will deviate under the null hypothesis and will be statistically insignificant. The indicators X1 and X3 are statistically significant, as both are significantly lower than 0.05. X2 cannot be accepted as statistically significant, as its value is higher than the level when the null hypothesis is accepted. Overall, the model's precision is lower than the one for Italy.

Fisher's criterion is 0.000, which proves the model's statistical significance.

Let's test the model for autocorrelation under the Durbin-Watson and Student's methods.

We get that the coefficient DW = 89.557/81.692=1.096. Du and Dt are higher than the basic value, which proves autocorrelation in the model.

Let's carry out another test for autocorrelation.

	Residuals	Residuals
Residuals	1	

	Residuals	0.442762	1

The significance coefficient will be 2.169, and the critical value for the model under Student's statistic is 1.711. The observed value is higher than the basic one, and thus there is an autocorrelation of the residuals. Again there is a positive autocorrelation of the variables, which means that the standard errors will be *smaller* than the true standard errors. That also means that the parameter estimates are more precise than they really are. There will be a tendency to reject the null hypothesis when it should not be rejected.

Correlation calculations for Germany are given in Annex 5.

Let's calculate correlation for the UK.

Table 6. Multiple correlation model for the UK

	GDP by PPP (Current US$)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
GDP by PPP (Current US$)	1			
Current account balance (current US$ billion)	-0.618	1		
Government debt to GDP, %	0.787	-0.677	1	
Total youth unemployment, %	0.431	-0.664	0.742	1

Source: Own calculations

ANOVA

	df	SS	MS	F	Significance F
Regression	3	196,642	65,547	16,022	0,000
Residual	22	90,005	4,091		
Total	25	286,647			

	Coefficients	Standard Error	t Stat	P-value
Intercept	12,589	1,763	7,142	0,000

GDP	-0,003	0,001	-2,468	0,022
Foreign debt	-0,056	0,025	-2,274	0,033
Foreign trade	0,149	0,036	4,137	0,000

The regression indicator has quite a low accuracy of the mode. The P-value indicators are quite low for accepting them as statistically significant

We get that the coefficient DW = 66.309/90.005=0.737. Du and Dt are higher than the basic value, which proves autocorrelation in the model.

Let's carry out another test for autocorrelation.

	Residuals	*Residuals*
Residuals	1	
Residuals	0.442761967	1

The significance coefficient will be 2.169, and the critical value for the model under Student's statistic is 1.711. The observed value is higher than the basic one, and thus there is an autocorrelation of the residuals. Again, we deal with positive correlation which shows that there is a positive serial correlation between time series of data. Thus, it can be stated that he standard errors will be smaller than the true standard errors. This will lead to the conclusion that the parameter estimates are more precise than they really are. There will be a tendency to reject the null hypothesis when it should not be rejected.

3.4 Discussion

The findings revealed earlier in this thesis allow stating clearly that the global financial and economic crisis affected the economic situation in Italy and drove deterioration of the country's labour market condition. However, in addition to this, it should be highlighted that the country's labour market had been surviving negative tendencies even prior to the onset of the crisis, which has been illustrate in this thesis as well. Furthermore, the unemployment crisis in Italy exists as of today.

The findings of the empirical analysis run within the practical part of this research prove that the model developed for regression analysis is effective: the three

chosen independent variables (GDP, foreign trade balance, and government debt) can be used effectively for investigating changes in Italy's youth unemployment, as they show a high level of correlation with the latter.

However, it can be stated that the GDP variable shows a rather weak correlation with Italy's youth unemployment, and this means that unemployment dynamics cannot be investigated in terms of Italy's GDP changes. But this does not mean that there is no connection between the two variables at all.

The major factor preconditioning the existence of the discrepancies outlined above is the fact that it is impossible to evaluate the interconnection between the investigated variables within the empirical model developed for only two years of the crisis, when the negative effects were the greatest. Otherwise, the number of observations would be too small to get any reliability of the statistical model. While there is no correlation between GDP and youth unemployment over the long-term perspective, this does not mean the lack of such correlation right during the global crisis persistence period.

The findings of this thesis prove that in 2008-2009, the labour market in Italy showed significant dropdown. This is also emphasized by Quirico (2010, pp. 4-5) who states that the global crisis was a major factor which drove uncontrolled growth in Italy's unemployment. The lack of effective government policies to respond to the development of adverse conditions in the labour market provoked major negative consequences for Italy. Unemployment among the youth suffered particularly during this period. The same conclusions are also drawn by Coletto (2010) who states that the preconditions for a major deterioration in the Italian labour market had existed before the crisis, and the global crisis acted as a trigger which fueled the outburst of those preconditions, and the subsequent persistence of major adverse consequences for the sector of unemployment.

Therefore, it can be stated that the crisis indeed caused a rapid increase in the growth of unemployment rates in Italy. The empirical model is invalid because the growth in Italy's unemployment continued even after economic recovery and the stoppage of GDP decline. This only proves that the model developed within the framework of this thesis should not be used. The phenomenon of youth

unemployment is more multifaceted than parameters of a country's economic growth and might be affected by a wide range of differently-vectored factors which should be taken into account when designing national policies aimed to achieve the best effects for the labour market.

Still, as the focus of this research was put on the investigation of the impact of the global crisis on the situation with youth unemployment in Italy, it can be stated that despite the invalidity of the model, there was definitely a significant impact on youth unemployment caused by the global crisis and Italy's ensuing economic recession in 2008-2009.

4 Conclusion

The labour market is essential for the effective operation of any national economy, and is in the focus of any state's economic policies. The labour market tends to react sharply to overall negative economic developments, which was proven in practice by the 2008 global financial and economic crisis which led to a major deterioration in the global labour market conjuncture.

The focus of this research was put particularly on the youth segment of the labour market, and it was shown that it is more vulnerable to external negative conditions and factors. As a result, this labour market segment requires particular attention on the part of public governments when designing public policies for steady economic growth.

The research question of this thesis was the following: to which extent did the 2008 global crisis affect the Italian labour market on the youth segment, and what consequences did it have for the country's overall economic situation?

Based on the findings of this research, it can be stated that the overall consequences of the 2008 global financial and economic crisis were very detrimental to the Italian national economy. Thus, the global crisis struck hard Italy's economic effectiveness across a range of different indicators: the country's exports shrank significantly as well as imports, its economic output dropped, and its GDP level was marked by a major decline. The country's dropping GDP per capita under the impact of crisis proved the rapidly decreasing purchasing capacity of the Italian population. Also, inflation fluctuated during this period, and Italy's activities in the investment sector survived a major decline too.

Focusing more in detail on the effects which the 2008 global crisis had on the Italian labour market, it can be stated that those consequences were substantial. However, in this case, it should be borne in mind that the Italian labour market had been struggling against negative tendencies even prior to the onset of the global crisis, and therefore the development of the crisis only further aggravated those trends and deepened the crisis in the Italian labour market.

The situation with youth unemployment was particularly negative during the times of the crisis in Italy. This was due to the fact that companies reduced their training programs and focused on the employment of experienced specialists, as well on the provision of part-time employment. Also, the Italian government failed to implement effective policies for motivating employers to provide vacancies for young specialists. Moreover, negative tendencies in the Italian youth labour market have persisted even sine the recovery from the negative consequences of the global crisis.

The empirical model developed within the framework of this thesis was set to evaluate the correlation between Italy's gross domestic product, foreign trade balance and government debt and the country's youth unemployment. The empirical model proved itself to be valid for Italy, even though with some discrepancies for other states with which Italy was compared in this thesis. There is a strong linear correlation between Italy's youth unemployment and foreign trade balance and government debt, while the correlation with GDP is rather weak. These findings are in line with the findings of the book by Coletto, D 2010, Effects of economic crisis on Italian economy, where the researcher associated the changes in Italian labor market dynamics with shifts in the country's foreign trade and GDP. The model in this thesis shows weaker correlation with GDP, but high correlation with the current account balance and their combined use, and this further confirms the viability of the model.

When speaking of the 2008-2009 period, it can be stated definitely that Italy's shrinking GDP under the impact of the global financial and economic crisis indeed contributed significantly to the country's problems in the youth labour market, and namely to the rapid growth of youth unemployment.

5   List of tables and figures

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7 Annexes

7.1 Annex 1. Calculation data for regression analysis for France

	GDP by PPP (Current US$)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
1990	1 032,20	46,46	37,1	19,81
1991	1 077,64	-26,55	41	19,74
1992	1 119,84	-25,25	45,5	21,69
1993	1 139,46	-21,41	49,8	25,53
1994	1 191,00	-33,44	52,1	28,79
1995	1 241,20	-32,19	55,8	27,09
1996	1 281,49	-17,02	59,7	27,55
1997	1 339,95	-11,52	61,1	28,94
1998	1 411,61	-15,63	61	26,17
1999	1 478,04	-31,31	60,2	26,32
2000	1 595,46	-33,79	58,6	20,63
2001	1 698,36	-7,02	58,1	18,01
2002	1 770,07	39,76	60	18,94
2003	1 758,83	36,06	64,1	17,25
2004	1 829,07	126,07	65,7	19,76
2005	1 933,51	131,66	67,1	20,28
2006	2 070,45	171,29	64,4	21,33
2007	2 186,19	233,27	64,3	18,83
2008	2 263,19	210,89	68	18,33
2009	2 249,68	198,87	78,9	22,95
2010	2 342,75	193,03	81,6	22,55
2011	2 447,56	227,97	85,2	21,94
2012	2 471,78	248,92	89,5	23,65
2013	2 608,50	253,48	92,3	24,07
2014	2 660,82	281,30	95,3	24,25
2015	2 729,18	279,97	96,3	24,67

Source: World Bank 2017

7.2

7.3 *Annex 2. Calculation data for regression analysis for Germany*

	GDP by PPP (Current US$)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
1990	1 542,73	-38,81	30,7	4,58
1991	1 675,51	-19,02	31,5	5,51
1992	1 746,67	-23,20	37,2	5,97
1993	1 771,13	-17,72	42,6	7,67
1994	1 853,27	-10,03	50,2	8,96
1995	1 924,80	-13,44	54,7	8,47
1996	1 975,03	-10,33	57,5	9,64
1997	2 020,30	-1,40	58,7	10,67
1998	2 081,27	-5,27	59,5	9,79
1999	2 164,17	-39,91	60	8,88
2000	2 242,49	-34,98	58,9	8,55
2001	2 350,37	-31,20	57,7	7,79
2002	2 419,13	-35,14	59,4	9,29
2003	2 475,05	-33,68	63,1	11,03
2004	2 594,28	-41,90	64,7	13,00
2005	2 636,42	-30,22	67	15,52
2006	2 822,34	-59,89	66,5	13,76
2007	2 997,50	-75,24	63,7	11,90
2008	3 122,55	-101,33	65,1	10,56
2009	3 036,96	-68,74	72,6	11,22
2010	3 210,82	-66,84	81	9,83
2011	3 427,14	-46,32	78,7	8,53
2012	3 503,68	-97,08	79,9	8,04
2013	3 651,08	-119,92	77,5	7,83
2014	3 814,25	-139,69	74,9	7,75
2015	3 924,04	-122,57	71,2	7,23

Source: World Bank 2017

7.4 Annex 3. Calculation data for regression analysis for the United Kingdom

	GDP by PPP (Current US$)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
1990	958,28	-9,94	38,1	10,42
1991	979,09	-6,52	35,8	13,88
1992	1 005,01	3,89	33,2	15,68
1993	1 054,72	8,99	36,1	17,48
1994	1 119,02	7,42	39,5	16,36
1995	1 170,99	10,84	45,2	15,55
1996	1 251,02	20,56	44,8	14,94
1997	1 323,75	37,80	43,9	13,60
1998	1 358,79	37,70	41,6	12,46
1999	1 406,97	50,69	40,2	12,42
2000	1 533,02	16,12	37,3	12,03
2001	1 617,45	20,96	34,6	10,33
2002	1 699,80	17,64	34,7	10,92
2003	1 783,36	15,98	35,9	11,36
2004	1 896,67	9,17	38,8	10,72
2005	1 949,43	-0,14	40,1	12,74
2006	2 089,01	0,52	41	13,93
2007	2 155,57	-8,72	42	14,28
2008	2 229,26	-28,18	50,2	15,02
2009	2 142,49	-22,06	64,5	19,12
2010	2 243,32	-22,03	76	19,88
2011	2 306,17	-29,49	81,6	21,29
2012	2 387,35	-32,89	85,1	21,21
2013	2 504,34	-24,38	86,2	20,68
2014	2 632,68	-31,47	88,1	16,95
2015	2 722,45	-4,86	89,1	14,60

Source: World Bank 2017

7.5 *Annex 4. Results of linear regression for Germany (x variable: GDP by PPP (in current USD billion); y variable: total youth unemployment, %)*

Regression Statistics								
Multiple R	0,624							
R Square	0,389							
Adjusted R Square	0,306							
Standard Error	2,075							
Observations	26							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	3	60,328	20,109	4,671	0,011			
Residual	22	94,722	4,306					
Total	25	155,050						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Y intercept	2,837	2,352	1,206	0,241	-2,041	7,714	-2,041	7,714
X 1 variable	-0,001	0,003	-0,397	0,695	-0,007	0,005	-0,007	0,005
X 2 variable	0,022	0,033	0,667	0,512	-0,046	0,090	-0,046	0,090
X 3 variable	0,173	0,088	1,971	0,061	-0,009	0,355	-0,009	0,355

Source: Own calculations

As can be seen from the table above, the findings for the linear regression analysis of Germany differ significantly from the previous findings observed on the cases of Italy and France: the R square and adjusted R square values are rather low, which proves that the linear relationship between the independent and the dependent variable is rather weak. From the P values, it can be concluded that there is particularly weak correlation between the dynamics of Germany's youth unemployment with GDP and foreign trade balance.

7.6 Annex 4. Multiple correlation model and calculations for Germany

Multiple correlation model for Germany

	GDP by PPP (Current US$)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
GDP by PPP (Current US$)	1			
Current account balance (current US$ billion)	-0.888	1		
Government debt to GDP, %	0.873	-0.615	1	
Total youth unemployment, %	0.202	0.046	0.459	1

Source: Own calculations

We see the low dependence of unemployment on other indicators.

Regression model for Germany
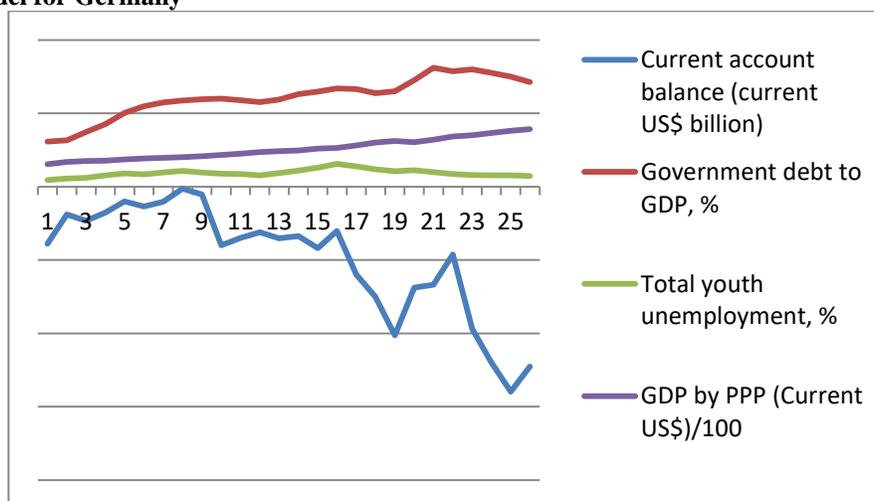
Source: Own calculations

Let's build a regression model taking into account all data.

Regression Statistics								
Multiple R	0,623768							
R Square	0,389086							
Adjusted R Square	0,30578							
Standard Error	2,074982							
Observations	26							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	3	60,328	20,109	4,671	0,011			
Residual	22	94,722	4,306					
Total	25	155,050						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	2,837	2,352	1,206	0,241	-2,041	7,714	-2,041	7,714
X Variable 1	-0,001	0,003	-0,397	0,695	-0,007	0,005	-0,007	0,005
X Variable 2	0,022	0,033	0,667	0,512	-0,046	0,090	-0,046	0,090
X Variable 3	0,173	0,088	1,971	0,061	-0,009	0,355	-0,009	0,355

The regression coefficient is low, which proves the model's low accuracy. At the same time, the P-value for X1 and X2 is above the null hypothesis level, which testifies the low statistical significance.

Let's test the model for autocorrelation under the Durbin-Watson and Student's methods.

Model for autocorrelation under the Durbin-Watson method for Germany

Ut	Ut^2	Utn-Utn-1	Utn-Utn-2^2
-0.927	0.859	0.000	0.000
-0.416	0.173	0.510	0.260
-0.767	0.589	-0.351	0.123
-0.093	0.009	0.675	0.455
-0.190	0.036	-0.097	0.009
-1.300	1.691	-1.110	1.232
-0.624	0.390	0.676	0.457
0.054	0.003	0.679	0.461
-0.808	0.654	-0.863	0.744
-0.948	0.899	-0.139	0.019
-1.106	1.222	-0.158	0.025
-1.617	2.614	-0.511	0.261
-0.244	0.060	1.372	1.883
0.889	0.790	1.133	1.284
2.901	8.413	2.012	4.048
4.815	23.185	1.915	3.666
4.008	16.066	-0.807	0.651
3.172	10.061	-0.836	0.700
2.308	5.325	-0.864	0.747
0.857	0.734	-1.451	2.106
-1.826	3.334	-2.682	7.196
-2.929	8.582	-1.104	1.218
-2.423	5.871	0.506	0.257
-1.546	2.390	0.877	0.769
-0.554	0.307	0.992	0.985
-0.684	0.467	-0.130	0.017
	94.722		29.572

Source: Own calculations

We get that the coefficient DW = 29.572/94.722 = 0.312. Du and Dt are higher than the basic value, which proves autocorrelation in the model.

Let's carry out another test for autocorrelation.

	Residuals	*Residuals*
Residuals	1	

Residuals   0.442761967   1

The significance coefficient will be 2.169, and the critical value for the model under Student's statistic is 1.711. The observed value is higher than the basic one, and thus there is an autocorrelation of the residuals.

7.7   Annex 5. Correlation analysis for Italy

Table 7. Correlation table for Italy

	GDP by PPP (current US$ billion)	Current account balance (current US$ billion)	Government debt to GDP, %	Total youth unemployment, %
1990	1,051.93	-16.44	90	28.95
1991	1,103.66	-24.30	95.1	28.15
1992	1,138.24	-29.28	104.9	28.32
1993	1,155.38	7.73	120.2	30.16
1994	1,205.35	13.20	117.7	31.79
1995	1,266.01	25.10	116.9	33.47
1996	1,306.04	39.97	116.3	34.73
1997	1,354.13	32.28	113.8	34.56
1998	1,418.20	20.11	110.8	33.76
1999	1,453.17	14.01	109.7	32.95
2000	1,537.80	0.67	105.1	31.47
2001	1,595.09	6.10	104.7	27.83
2002	1,634.26	-3.38	101.9	27.14
20	1,666.64	-9.30	100.5	26.80

03				
20 04	1,699.88	-6.46	100.1	24.44
20 05	1,742.09	-17.02	101.9	24.12
20 06	1,880.99	-28.75	102.6	21.76
20 07	1,985.92	-30.52	99.8	20.36
20 08	2,082.64	-66.85	102.4	21.20
20 09	2,041.70	-40.32	112.5	25.34
20 10	2,079.20	-73.11	115.4	27.90
20 11	2,158.29	-68.56	116.5	29.16
20 12	2,157.55	-7.80	123.3	35.32
20 13	2,178.29	20.76	129	40.04
20 14	2,206.27	39.54	131.9	42.68
20 15	2,260.23	29.35	132.3	40.32

Source: Own calculations