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**The role of Employment protection legislation  
and Product market regulation on youth  
employment**

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*A Giulia,  
che in tutti questi anni  
mi è sempre stata vicino.*

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## Introduction

The difficult condition that young people, in search of a first job, are going through in these years is not negligible. The number of unemployed is alarming. The lack of stable employment also has social consequences: young people do not have financial resources to allow them to move away from the family.

The low employment levels in Europe deserves some interest due to the seriousness of unemployment rates of young people in many Member States, especially those in the Mediterranean macro-area.

Youth employment is a central theme of activation policies, in which there is a lively political debate signed by the plurality of positions expressed by policy-makers, stakeholders and politicians.

This dissertation aims to analyse the effect of regulation on the youth employment level.

The productivity of a country depends on the degree of efficiency with which the resources are used in the system. Efficient markets establish efficient employment levels.

A system that encourages competition allows for a better allocation of resources, for a more decisive stimulation of investments and, consequently, for an increase in employment. Competition policy aims to strengthen the possibilities for economic growth. The achievement of the result requires, however, a profound change in the relationship between political power and the economy. The motivations that push the State towards a policy of interference can be traced to the will to avoid, or solve, the failures of the markets (natural monopoly conditions, externalities, information asymmetries) or the need to redistribute wealth in a fair way.

In many industrialized countries, too many rules have been added, which overlapped over time. They have often proved to be contradictory enough to make regulation ineffective and unnecessarily binding for the conduct of economic activity. It is precisely for this reason that in the last twenty years many European countries have decided to adopt policies to deregulate the product and labour market. Regulation in the goods market entails a limitation in the creation of new businesses, increasing entry costs or reducing the granting of permits and licenses. While, in the labour market, the rules determine a high degree of burdensome hiring and redundancies by giving the employed workers a very strong market power.

A look to European employment and unemployment level is displayed in the first chapter of this dissertation. The aim is to examine the differences in data for different groups of workers in the short and long-term and looking at the effect that the crisis has had on European employment numbers. Then always in the first chapter, is provided a brief explanation of the causes that determine the

employment of young people. Mentioning, furthermore, the effects that regulation has on employment levels. In the second chapter, the concept of regulation in the labour and product market will be developed in depth. We will study the relationship between EPL with, respectively, turnover costs, employment level and youth employment. Moreover, the relationship between product and labour market will be studied. The last two chapters are devoted entirely and respectively to the economic and empirical analysis of deregulation and its effects on employment. In the third chapter we will try to explain the model of Blanchard & Giavazzi of 2003 (which highlights the role of regulations and deregulation of the market of goods and the labour market), which is still one of the pioneering models on the topic and the economic basis of various models developed later. Finally, in the last chapter we will try to give a personal empirical interpretation on the topic, analysing the rate of youth employment and the relationship that exists with deregulated market. The youth cluster will be compared with the adult counterpart and then subdivided by level of education and gender. To study the impact of deregulation on different samples and to estimate the level of regulation in 22 OECD countries over the period 1998-2013, I used the PMR and EPL indicators computed by OECD.

# 1 A look at the causes of the employment and unemployment rates

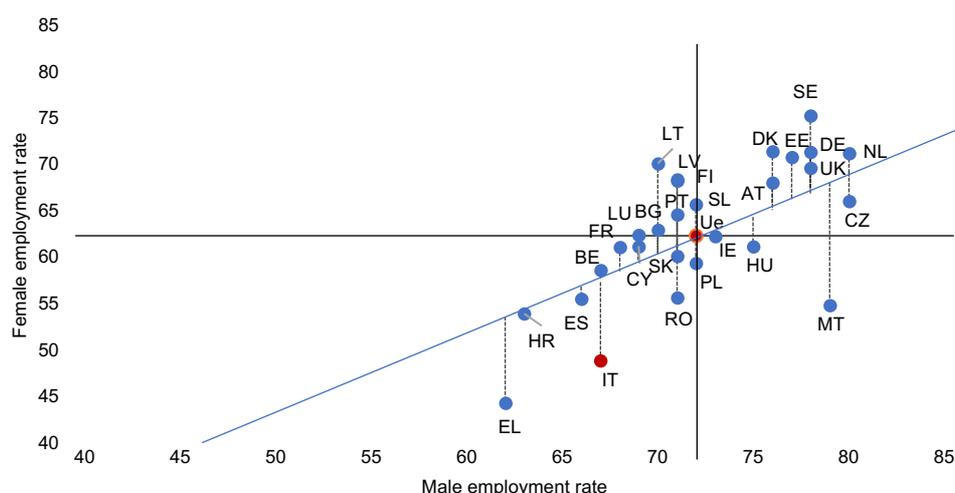
## 1.1 European employment in recent years

A valid analysis on youth unemployment must be able to contextualise the phenomenon in the territory in which it manifests itself. In this chapter, we want to propose the situation of young Europeans looking for employment, analysing the proposals of the European Commission to reduce the unemployment rate and promote employment.

In 2013, the EU employment rate for people aged between 15 to 64 stood at 64.1%. The EU employment rate reached the peak in 2008, touching 65.7% of the population and declined over the following years, standing at 64% in 2010. This decline was followed by a period of stability between 2010 and 2013, and then in 2014, return to the upward path observed before the crisis. The financial crisis has led to remarkable differences in the performance of individual labour markets. While the overall employment level for the EU in 2014 was even lower than the levels recorded in 2009, some Member States showed a clear increase in their total rates. Germany, for instance, has had a raise in the employment rate of about 9 percentage points in the ten years from 2004 to 2014. Other states such as France have maintained an almost stable employment rate over the entire period. In contrast, the Greek employment rate fell from 61.4% in 2008 to just under 50% in 2013. Reductions were also seen in Spain and Italy rates. However, in recent years, especially between 2016 and 2017, the increase in the number of employees aged 15 and over has improved significantly (+1.5 percent) in Europe. The employment rate of 15-64 years in 2017 is 67.6 percent (+1.0 percentage points compared to 2016), with always very high variability, ranging from 76.9 percent in Sweden to 53.5 of Greece.

The European average shows an increase in the similar employment rate between men and women in the last year (respectively 1.1 and 1.0 percentage points). However, even if in the decade of 2008/2017 substantial increases in female employment rates are observed, in particular in Germany (+7.2) and Poland (+7.1), the European gender gap average almost unchanged. There is a steady relationship between the female and the total employment rate. Countries where the employment rate is high, experience high rates of female employments (*Figure 1.1*).

**Figure 1.1: Gender employment difference in Europe**



*Source: OECD Statistic 2017*

Countries such as Germany, the United Kingdom, Sweden and the Netherlands have achieved a high and balanced level of participation between men and women. In contrast, others, including Italy, Spain and Greece, still show a substantial gender difference.

Focusing on the unemployment rate, we can see a decrease in all the countries of the European Union, on average 1.0 percentage points. After the crisis, unemployment has not yet been reabsorbed in Greece (+13.7 percentage points compared to 2008), Spain (+5.9 points), Italy and Croatia (with 4.5 and 2.6 points respectively) compared to 2008. However, in these countries and in the last year, the drops are stronger except for Italy. Compared to 2008 Germany and Hungary record the most significant decrease in unemployment rates that are among the lowest (3.8 and 4.2 percent) together with the Czech Republic (2.9 percent) and the Netherlands (4,9 percent). The number of unemployed in the European Union in 2017 was just under 18.8 million, with a reduction of about 2.2 million compared to the previous year. In the last few years were introduced a lot of different contracts. In fact, over the last decade, part-time workers had increased by about 5.7 million in Europe, and those who worked full-time were reduced by one million (-0.5%). The countries with the highest incidence of part-time remain the Netherlands (50.7 percent and 76.0 among women), Austria (28.7%, of which 47.7 percent among women) and Germany (28.2, with 47.3 percent among women). The countries with the lowest incidence are those of Eastern Europe. Despite this, in Europe, in 2013, the number of unemployed aged between 15 and 29 years has reached 9 million, with a significant increase compared to the previous year.

Since this is a consequence of a deep crisis, it is important to plan appropriate structural policies to guarantee employment with a long-term vision, even for the "young" bracket. In this sense emerges

the concept of "full employment" able to include all social classes. We need to pay particular attention to those people who, discouraged, tend to leave the labour market and become inactive, and very often these individuals are just the young.

### 1.1.1 The impact of the crisis

As the previous data show, young workers were those affected harder by the recession in European countries. The impact on employment as a result of the crisis varied mainly according to the levels of education of workers. The employment rate of low-skilled workers has declined sharply and, as a consequence, the unemployment rate has increased.

On the contrary, positive effects were observed concerning qualified and highly qualified workers, which continued to grow throughout the period. Employers tend to invest in skilled personnel because they are more productive and source of higher profits for companies, this is thanks to specific skills and knowledge that are more difficult to replace. The opposite case occurs for unskilled personnel, that can be replaced more easily. Remarkable differences in unemployment rates (divided according to the level of education) appear to be pronounced in countries where the crisis has hit more violently, such as Spain.

Self-employed workers have also been strongly affected by the crisis. However, there are differences in each country, which tend to reflect various factors of influence, including legislative regimes, economic cycle and political representation. Ireland and Estonia, for example, have suffered a drastic decrease in employees with a fixed contract, in Spain, on the other hand, there has been a drastic lowering of the temporary employment rate.

A different topic must be addressed concerning the young people. They represent the category most at risk. They are, in fact, more subject to layoffs, and especially in times of insecurity, they are less attractive, compared to the adult counterpart. It is no coincidence that the unemployment rate of young people has increased considerably in the years from 2008 to 2013 and that this has not stopped in the following years in the Mediterranean countries. On the contrary, the employment of the older counterpart (55-64 years old) seems to have benefited from the situation, there has been a marked increase in the employment rate for this age group, in particular for women. These results can be broadly extended to the various countries of the euro area, including those most affected by the crisis, where the decrease in employment has taken place but at a more moderate pace than that of young people.

Continuing the gender analysis, first of all, we can affirm that the gap that has always existed between male and female employment has been considerably attenuated during and after the crisis. This was

a characteristic that united several European countries, albeit with different rates and dimensions. Therefore, men have suffered a significantly greater decline in performance than the female counterpart; this analysis can be extended to all age groups considered (with a remarkable difference considering the youth sample).

### 1.1.2 Long-term unemployment

Breaking down the characteristics of unemployment by duration, we are able to have a much broader view of crisis' influence on the economic system. Initially, the ranks of the unemployed had been filled by those who had just lost their jobs; this drove to a phenomenon that had led to a decline in the short-term employment rate in 2008. With the proliferation and worsening of the economic situation of several European countries, the difficulties in finding employment became persistent, so long-term unemployment duration began to take hold and increase since the end of 2008. Reaching the last quarter of 2011 with 46.2% of total unemployment in the monetary union area, losing about five percentage points compared to the beginning of 2009.

Several reforms have been implemented and supported in Europe since the early 2000s, with the sole aim of reducing early retirement and increasing the legal age to retire. These solutions have stimulated labour supply for the elderly age group, further worsening youth employment.

The labour market reforms in Germany<sup>1</sup> at the beginning of the 2000s are an excellent example. Specifically, a drastic change was given by the German Reformation implemented between the years 2003/2005, under the government of Chancellor Gerhard Schröder, who took the name of Hartz reform. The reform was implemented progressively through four laws. The Hartz reform gave strength to the German welfare thanks to state grants which benefited millions of unemployed, who proved to be in active job search. The German unemployed were solicited with work proposals, which could not be refused under penalties (10%, 20%, 30% or 60% less than the contribution depending on the case) and suspension of the same subsidies for three months in cases where the proposal had been habitually refused. The nature of unemployment benefits reforms has become increasingly severe over the years, the eligibility criteria have become stricter, and penalties for refusing a job offer have been increased.

The European countries, to increase the chances of finding a job for the unemployed, have decided to adopt different policies aimed at improving the supply side of work, with the sole purpose of increasing the chances of finding employment to the unemployed. One of the problems that could be

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<sup>1</sup> For further information on the reform consult the *appendix 1*.

improved through targeted policies was precisely the optimisation between research and job opportunities. This optimisation could be achieved by reducing the barriers due to information (so-called information asymmetries), or through investments in human capital with the purpose of increasing the skills and abilities of workers. Almost all countries have decided to focus on improving the human factor by taking training courses for the unemployed. Some countries such as Austria and Ireland have decided, through grants, to give the possibility to those who are unemployed to continue their studies, while other countries like Cyprus or Italy have focused on training and hiring young people directly in companies, thanks to State incentives. In order to make it easier for companies to hire new staff, direct subsidies were introduced for new employees, and sometimes the non-wage costs were deleted. The various allowances distributed had the sole and only purpose of improving the employment situation of specific groups; therefore, the primary objective was an improvement on the labour supply side. Non-wage costs, while representing an attempt not only to improve employment but also to influence the demand for work, reducing the burden on companies by increasing the possibility of new jobs and diminishing the risk of business failure. Other countries have decided to invest directly through work programmes or real public investments, concentrating their resources trying to marginalise the future problem of long-term unemployment.

To cope with the widespread phenomenon of youth unemployment, in 2012, the Council of the European Union sent specific recommendations to the Member States facilitating the transition from the school world to the labour market, through a special guarantee system, to support traineeships offering quality work experience and to provide young people more opportunities for work and training abroad. To reduce youth unemployment, the EU has both financial resources (thanks to the European Social Fund (ESF)) and the necessary strategic guidelines. For higher efficiency and effectiveness of policy programmes, it is essential that there is integration between the Member States, and that best practices are applied which guarantee the best results by seeking the most appropriate strategies and the most appropriate policy.

## 1.2 Principal actors in the employment process

The statistical data presented in the previous analysis inevitably require an explanation of the causes of youth unemployment, especially because of the high number of the unemployed present in the different EU Member States. We have seen as the employment situation may change considering different countries and we try to find an explanation of this heterogeneity relying on previous results. The literature identifies three main factors that determine the employment level:

- institutional factors;
- welfare reforms;
- economic policies.

### 1.2.1 Institutional factors

National and regional institutional factors have proved to be extremely relevant for youth employment. Regarding the direct impact, it was noted that the scourge of youth unemployment is also attributable to the shortcomings of the political actor in the policies addressed to young people. We can note the absence of a long-term strategic vision for the solution of the youth condition or the inability to cooperate between public and private actors involved in the implementation of political measures aimed at young people. (Berthet & Bourgeois, 2014). In more specific terms, the absence of a strategic vision was due to the fact that not all Member States or Regions, especially in Mediterranean Europe, have developed a solid school-work transition, marked by clear steps, and enriched by certain services in favour of needy citizens. Besides, we can also find defects concerning the implementation of employment insertion or reintegration policies aimed at the youth target, especially due to: an opaque distribution of competences between public and private actors or to a disproportionate and inefficient attribution of powers to the State rather than to local authorities (Berthet & Bourgeois, 2014). The consequences of these impacts of an institutional nature have indeed been negative for young people emerging from a training programme. In the absence of a valid link between training and job opportunities, those who did not have a high family income or belonged to disorganised and economically stagnant territorial contexts paid the highest price for lack of youth policy. In the case of the indirect institutional impact, instead, at least the following two aspects must be mentioned: the lack of incentives for entrepreneurship and the weakness of formal and informal institutions. In the first case, it should be noted that the lack of incentives for entrepreneurship is manifested in the presence of excessive taxation, high bureaucracy and an unclear and redundant regulatory framework which mainly prevents small and medium-sized companies from taking on new

labour. The weakness of formal and informal institutions has instead manifested itself in their inability to govern and coordinate the collective decision-making process and the persistent lack of trust gained by individuals and families towards the institutions themselves (Barca, 2009).

### 1.2.2 Welfare state

In recent years, almost all EU Member States have opted to rationalize welfare services, reducing public spending. In this process, the universalistic concept of welfare state, aimed at providing services for the whole community independently of the individual's social status, has diminished in favour of an active and enabling welfare state (Lundhal & Olofsson, 2014). The basic idea was to prevent the citizen from simply surviving using grants, focusing instead on a citizen who found the main form of social integration in work activism. The provision of services and benefits focuses on the emancipation of people so that any non-fulfilment by the beneficiary often leads to end of financial disbursements. The transition to a new paradigm required a new organizational and cognitive approach in welfare policies and in the offices in charge. In the cases of the most virtuous states on the subject, the public administration or the private actors that provide a service have conceived the beneficiaries not as subjects deserving of protection but of the resources on which to carry out social investments (which in the literature are called social investment) or innovative interventions (often interdependent social service packages), both subject to ex-post monitoring and evaluation. Along with this proactive approach, appropriate measures have been set up for young unemployed people: in this case, the pioneering role of Sweden should be noted, which already in 2007 proposed a national Youth Guarantee programme for young people between 18 and 24, pledging to provide training and work opportunities in contrast to inactivity. This programme was then evaluated positively, expanded and included in the framework of the Europe 2020 strategy, the name was left unchanged, and the only purpose of its activation was given by the need to give a perspective and help young people to enter in the labour market.

In "The Youth Guarantee", the states of the European Union must assure that all young people under the age of 29 can find a job in line with their knowledge, skills and experience within the 4 months from the achievement of the degree, from the abandonment of studies or from loss of work. It should also be ensured that young people, who are interested, have the opportunity to acquire the knowledge and skills of interest through direct experience. The primary aim is a reduction in the non-active population. Unlike previous interventions, this manoeuvre intends to offer directly to young European (neither employed nor engaged in study or training activities (NEET)) one of four proposed

alternatives: work, apprenticeship, traineeship or further education. The realisation of the "The Youth Guarantee" manoeuvre involves profound structural reforms to be implemented to make the transition from studies to the world of work easier. The purpose is to prevent young people from leaving school early or accepting unsatisfactory work solutions by increasing their potential and making them more attractive and suitable for today's business environment.

The "Youth Guarantees" has become a solid reality throughout Europe. It has helped to increase the quality of life of many young Europeans. Since 2014 more than 5 million young people have signed up to youth guarantee schemes every year. More than 3.5 million young people enrolled in the programme have benefited of a job offer, education, training or apprenticeship. Over two-thirds of the young people who came out of the guarantee in 2015 have found work, undertaken study paths, apprenticeships or traineeships (Indicator Framework for Monitoring the Youth Guarantee, European Commission 2015). In 2014, the position of young people in the labour market improved:

- In the EU there are 2 million young unemployed less and 1 million young people, that instead of not working, are attending courses of study or training (NEET)
- Youth unemployment dropped from a peak of 23.7% in 2013 to 18.7% in 2016

The success of "The Youth Guarantee" is measured by its ability to create social inclusion by making young people participate and active in the world of work, but above all by positively impacting on the rate of youth unemployment in Europe.

### 1.2.3 Economics policies

Among the economic factors and related policy measures, it is appropriate to consider two aspects: structural changes in economic activities and the impact of the financial crisis of the 2008/2009 period. The production system in the Member States has undergone a change in the last thirty years as a result of post-industrialisation and international competition powered by countries with lower labour costs. The consequence of this phenomenon has been the relocation of countless European industrial companies, implying a lower demand for labour. In the countries most affected by deindustrialisation, the choice of a wide range of entrepreneurs has been a withdrawal to the tertiary sector and industrial products of excellence or high technology. The lower weight of the industrial workforce was in fact offset by greater demand for specialised professionals and occasional workers. It should be noted that no doubts have been expressed regarding the ability of new sectors and economic activities to absorb the labour force emerging from the industrial cycle and the young labour force (Bubbico, 2015).

There have been different public interventions, faced with this radical change in production methods, mainly national, aimed at supporting the adjustment of the economies. Three policies, in particular, have been involved in the process, leading to effects on youth unemployment: macroeconomic policies, territorial development policies and labour policies. Considering jointly macroeconomic policies and territorial development policies, these have provided a support for productive reconversions, as well as for the development of strategies for industrial, economic and, in the more forward-looking, educational policies to be applied at national and regional level. In this framework, the European Union has also succeeded in influencing the regulation of economic development, especially through the cohesion policy (Barca, 2009) and the coordination of macroeconomic policies. Macroeconomic policies and territorial development, however, have not always succeeded in favouring the redevelopment of the incoming workforce, due to the following shortcomings: policies without a response with representative of the territory and young people; policies undermined by the lack of credibility of the public actor as well as of social capital between political actor and civil society, policies conditioned by overly generic or experimental objectives; policies burdened by a high bureaucratic fragmentation and poor management of public funds (Sbrescia, 2015).

Labour policies, on the other hand, have strengthened the flexibility of labour contracts, encouraging the use of fixed-term and part-time employment contracts in most countries. This has been justified as an adaptation of the labour power to the production methods that are increasingly flexible.

## **2 Employment protection legislation and product market regulation**

The public authority, to achieve multiple purposes, can affect the natural balance of the market and the activity of private companies through two instruments: taxation and regulation. In this section we will analyse the function of regulation in the market.

The regulation of goods and labour market is often considered as one of the main causes that have led Europe to have relatively low levels of growth and development in contrast to those of the United States. Economic regulation can be defined in general as the use of the coercive power of the government to limit the decisions of economic agents. It may include restrictions on business decisions regarding entry, exit, use of inputs, quantities and types of output produced as well as prices. These restrictions are likely to influence the functioning of labour and product markets significantly. Furthermore, as market forces will continue to operate even under the strictest regulatory conditions, results in labour and product markets will generally be driven by the interaction of these forces with the existing regulatory framework.

The term regulation identifies the set of constraints (prohibitions and obligations) and controls placed on the performance of economic activities (exchange and production) by operators (companies and individuals). In non-socialist societies, it is assumed that social welfare is nothing more than the aggregation of the well-being of individuals.

From a purely theoretical point of view, regulation is a tool designed to increase the welfare state; the main problem is that often are left aside those that are the social purposes for which a correct regulation is needed, ending up by intervening in the economy with rules that turn out to be bankruptcy. This may suggest that sometimes it is better to switch to total deregulation. According to the neo-classical theory, in fact, through the price mechanism, the market spontaneously generates information about preferences and scarcity of resources; information that otherwise would not be available and which allows efficient allocation of existing resources. It also considers that all agents have full information on technology, which maximises their usefulness and that nobody is able, with his own demand and supply, to influence prices. Moreover, they consider the total absence of externality.

The traditional justification that economic theory gives of regulation consists in the fact that in the real world these conditions are almost always not met (markets fail). In fact, it is unthinkable to leave the free market to operate without any constraint.

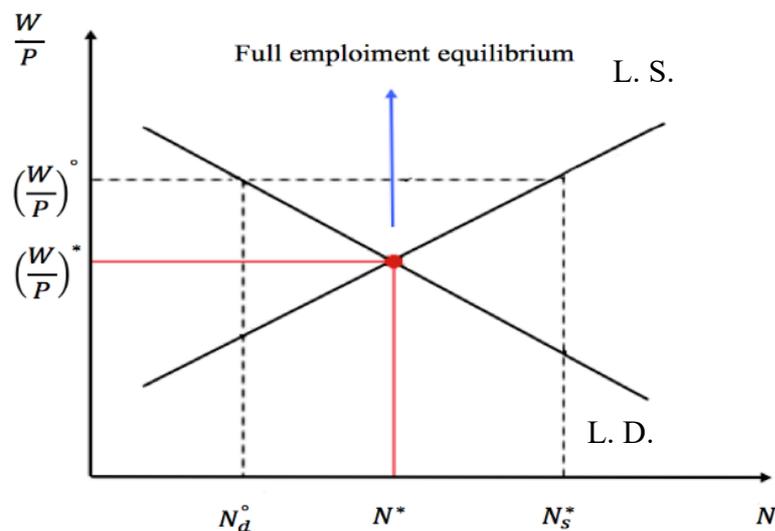
Below, the focus is on a subset of government restrictions that can affect the level and composition of employment. These include (i) labour market regulations governing assumptions and decisions to dismiss companies; (ii) regulation of the product market that limits company decisions on entry and

exit along with direct state intervention in the allocation of resources, through public ownership and control of companies. Conceptually, these regulatory interventions can have both direct and indirect effects on the equilibrium of the labour market, both in isolation and in the interaction between themselves and with other public policies.

## 2.1 Regulate the labour market

A labour market is a theoretical place where the criterion of competition and equilibrium can be achieved thanks to the price system. It is the meeting point for supply and demand for work and for businesses and workers. It also indicates all the mechanisms that regulate this meeting and, consequently, the formation of wages. So, it is the place where the real wage is contracted ( $W/P$ ). As can be seen from *Figure 2.1*, the labour demand curve is negatively inclined, while that of the supply is growing.

**Figure 2.1: Labour market**

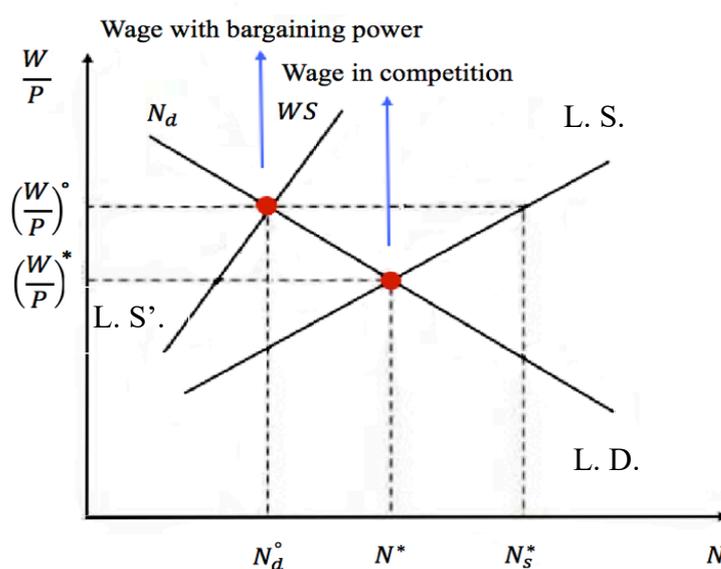


If in the hypothesis of equilibrium, the point of full employment was reached, there would be only voluntary unemployment, i.e. not only those who have a higher reserve wage than the equilibrium wage would work. If, as in the case of goods, the market is not left free to act and there are external interventions, involuntary unemployment is generated: graphically corresponds to the  $N_s^\circ - N_d^\circ$  segment. The fact that the market does not act in competitively can, therefore, be guessed by the fact that, in a competitive context, in the presence of unemployment competition among workers should eliminate the difference between the salary received and the reserve wage. The presence of this

difference means that workers have power market, which can be interpreted as a contractual force. The bargaining power of workers depends on two factors: the cost that the company should bear to replace a worker, in the case of dismissal; and the difficulty for the worker to find another job. So, the strength of the workers is higher when the unemployment rate is low because the companies are in the most disadvantaged position. Therefore, it is possible to imagine a negative relationship between unemployment and wages. The difference increases the more pervasive the public intervention in the market is and the greater the contractual strength of the workers are.

The neoclassical theory has traditionally attributed the responsibility for the presence of unemployment in the labour market to the union. The belief is based on the fact that if the labour market is not competitive, the labour supply curve will replace the union indifference curves, causing an increase in the balance wage, a decrease in employment and a decline in the product. The phenomenon can be observed in *Figure 2.2*.

**Figure 2.2: Labour market in the presence of the trade union pressure**



The unions with their pressure prevent wages from having the flexibility necessary to guarantee the full employment of the labour force. The wage (resulting from union bargaining) is set too high: the presence of trade unions becomes one of the leading causes of unemployment. Perfect wage flexibility would be enough to ensure full employment. If the market is free to act, its rebalancing forces will allow to reach the point of equilibrium. To achieve this result, the necessary condition is that the salary is not rigid; in this way it would allow, in the medium term, to reach the level of competitive wage and full employment, eliminating involuntary unemployment. Labour market regulation policies are, as we have seen above, often associated with the idea of salary flexibility and labour

contracts. Flexibility means the ability of individuals to abandon pre-established schemes and adapt to new circumstances, in the economic system and, in particular, in the labour market. It is not, of course, only the unions that cause rigidities in the labour market. State intervention with legislation on layoffs, minimum wages and working hours does not allow the market to self-regulate. For the labour market, the OECD collected data concerning the member countries and published very useful indicators to characterise the current regulation. They are built according to the rules and laws concerning the recruitment and dismissal of workers, through the two temporal dimensions of fixed-term contracts and permanent contracts.

### 2.1.1 Employment protection legislation

In all OECD countries, some rules regulate the employment relationship between workers and companies. Those referring to dismissal practices are often included in the employment protection legislation (EPL). These rules and regulations govern: unfair dismissals, restrictions on releases for economic reasons, severance indemnity, minimum notice periods and administrative authorisations. EPL regulations can influence the level of employment balance, as well as its dynamics on the business cycle. When we think about employment protection legislation, we refer to the whole number of rules and procedures concerning the faculty of companies to hire or dismiss workers, changing the labour policy to adapt it to local contexts better.

*“Employment protection legislation deals with: the lawfulness of probationary period, mandated notice periods and severance payments (payments to workers for early contract termination); procedural requirements to be followed for individual dismissals or collective redundancies; sanctions for unfair dismissal and conditions for using temporary or fixed-term contracts. Such rules and procedures may be enshrined in law or in collective or individual labour contracts” (EUROPEAN SEMESTER 2017).* The effectiveness of employment protection also depends on additional institutional factors such as collective bargaining agreements, court interpretations of legislative and contractual provisions. There are minimum requirements that are common in all the Member States that must be followed and respected according to international treaties and international organisation (International Labour Organisation Conventions, the EU Charter of Fundamental Rights<sup>2</sup>, the EU Treaty and EU Directives). However, except for some focal points, EPL is heterogeneous in all the Member States. These differences depend on different legal traditions that represent the institutional pillars of each nation.

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<sup>2</sup> According to Article 30, 'every worker has the right to protection against unjustified dismissal, in accordance with Union law and national laws and practices'

The “raison d’être” of the legislation is given by the protection of workers from arbitrary action by employers. The latter must satisfy a series of requirements when dismissing workers. These reflect the social costs of dismissal to some extent.

Employment legislation can be viewed as a sort of insurance of workers against income risks. As suggests Pissarides (2001), in the presence of complete insurance market, the need to ensure workers does not arise. But perfect insurance market expects to be corrupted by moral hazard and adverse selection, so, it cannot exist in the real world. Therefore, in certain cases both workers and firms might require employment legislation. The ratio behind is that, while for worker represent insurance; for companies, this represents the possibility to reduce the costs of labour (thanks to higher productivity or by lowering the mean wages for a given level of productivity).

### 2.1.2 EPL indicators

The OECD has published estimates, based on numerical indicators, on the degree of "rigidity" of employment protection regimes for the Member States since the beginning of the 1990s. In these years a long season of reforms in the field of labour relations began and almost all countries have moved along the direction of a gradual loosening of the constraints placed to protect the workplace. The OECD by EPL indicators measure the degree of narrowness of the procedures and the costs involved resulting from both the dismissal and the administrative-economic processes that follow the recruitment of workers. Referring not only to individuals but also to groups of workers and whatever is the nature of the contract, fixed or temporary.

#### Individual protection

For this area have been considerate three main characteristics: notice and severance pay provision, the difficulty of dismissal and procedure inconveniences that the employer may face. These conditions are the setting under which the employer can dismiss an employee.

- Notice and severance pay provision may be different based on the characteristics and type of worker (the main class-group are: blue-collar or white collar<sup>3</sup>) or whether the motivation of dismissals is due to personal reasons or external factors. In general, both notice and severance payments tend to be higher for white-collar workers than for blue-collar ones. (OECD, 1999).
- Procedural requirements refer to the process that should be followed once the employer decides to lay off a worker and must be last until the actual termination of the contract. Countries are scored according to:

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<sup>3</sup> A blue-collar worker is a working-class person who performs manual labour, while white-collar work may be performed in an office or other administrative setting.

- the delay before the notice of dismissal can start,
  - whether a written statement of the reasons for removal must be supplied;
  - whether a third party must be notified or consulted;
  - whether dismissal cannot proceed without the approval of a third party. (Nicoletti & Scarpetta, 2003).
- In the last years, almost all OECD countries have legislated remedies for unfair dismissal. The “difficulty of dismissal” includes the length of the trial period because during this period a dismissal cannot be contested for its unfairness. Moreover, it includes laying off taken without considering social factors of age or work and, also, the account is taken of the fact that, in certain cases, the labour court can decide to reinstate a worker that was previously fired wrongly.

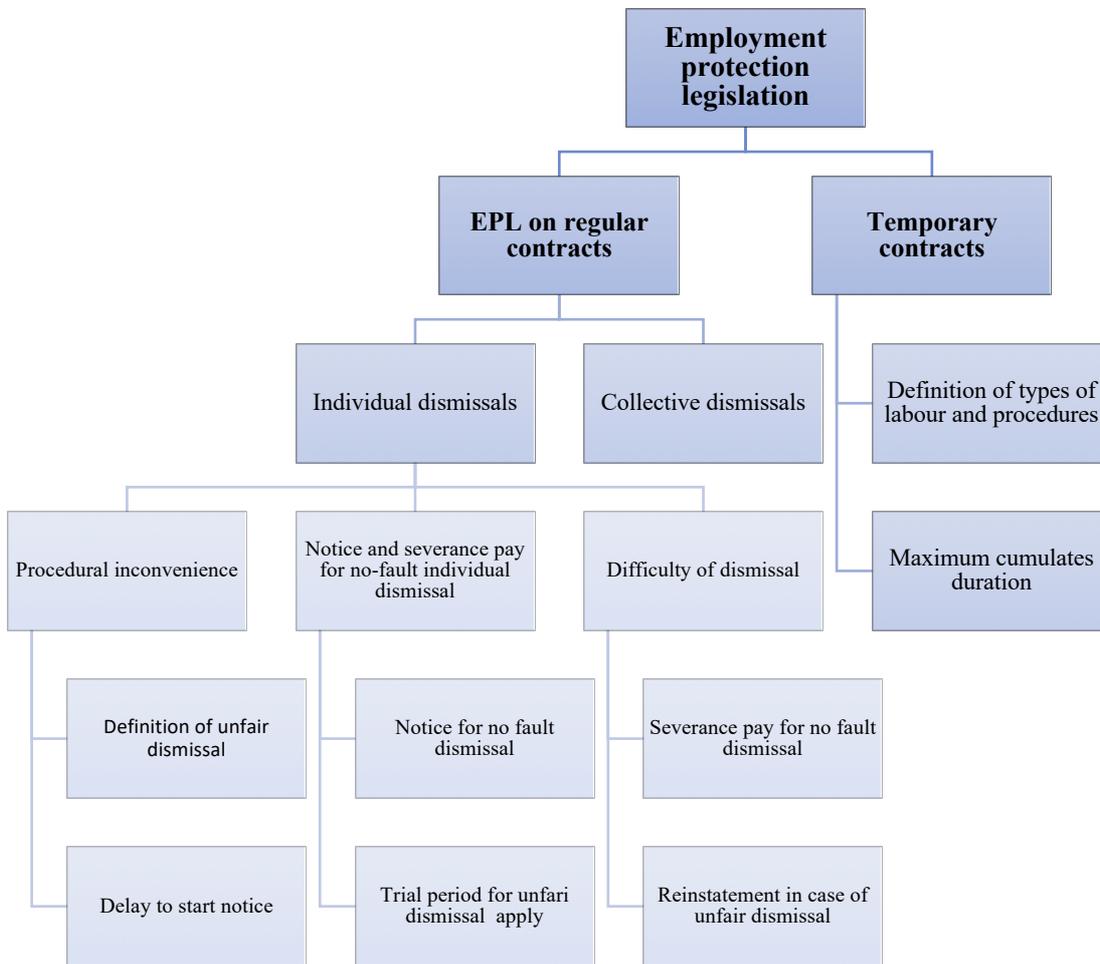
### Collective dismissal

To deal with the possible social costs have been introduced the additional provision to minimise these costs This index mainly refers to further delays and procedures required that are different from those considered for individual protection.

### Temporary contract provisions and temporary work agencies

This component measures the restriction on the use of temporary employment by firms, considering the type of work for which these specific contracts are guaranteed and the respective duration. The indicators of the stringency of EPL for fixed-term contracts refer mainly to the maximum cumulated length of the contract and the maximum number of successive renewals.

**Figure 2.3: table of labour market regulation indicators**

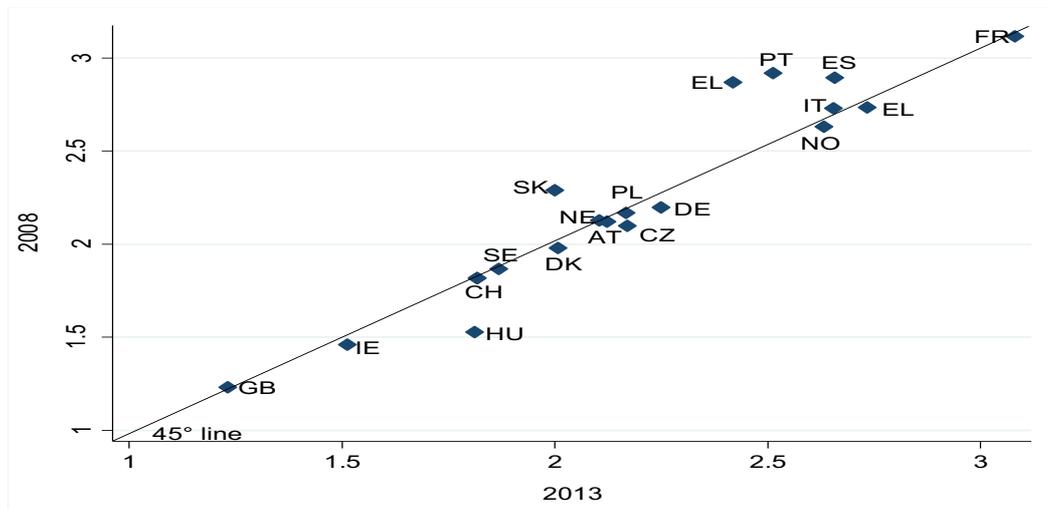


*Source: OECD*

### 2.1.3 What has changed in the last years

In almost all countries protection against individual layoffs has decreased in the last years, especially in Greece, Czech Republic and Portugal. This change in labour market regulation is mainly due to the effect of the economic crisis that hit European countries since the end of 2007. In the specific case, considered States were characterised by stringent legislation and, in the years of recession, they had to adapt structural economic changes, aiming at more flexible labour regulation. It is estimated that more than a third of the OECD states have undergone a certain loosening of the rules on individual or collective redundancies and looking exclusively at the European level we can notice similar results (Figure 2.4).

**Figure 2.4: Employment protection legislation indicators**



(Note: difference in the restriction of employment protection legislation between 2008 and 2013).

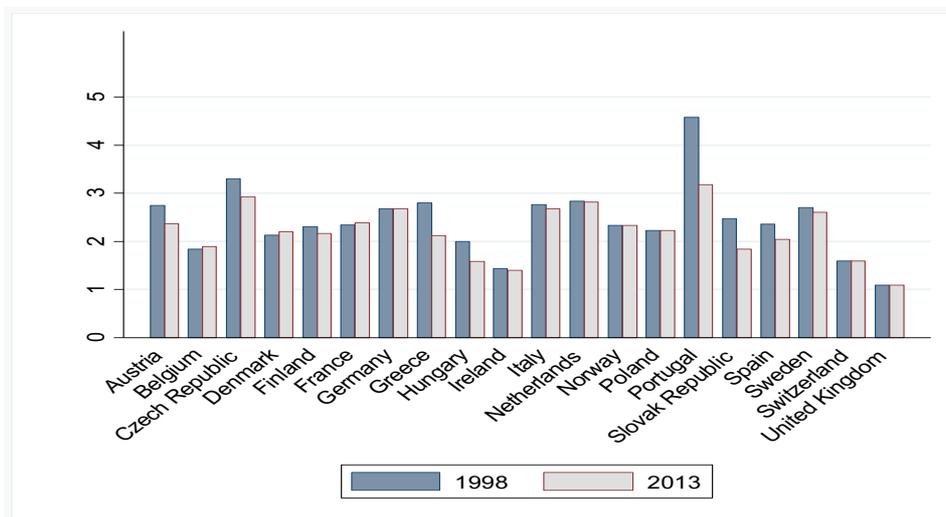
Source: OECD Statistic

These changes can be interpreted as a sort of convergence with the policies already adopted in several European leading countries. In the case of Portugal, several reforms have been carried out in this direction in recent years. Before the reforms, labour market legislation had a considerable regulation gap between temporary and permanent contract. On the one hand, the market was characterised by high redundancy payments, employer's difficulty in firing workers and the possibility given to the worker to be reinstated immediately after an unfair dismissal, on the other hand, the regulation for hiring workers with fixed-term contracts was in line with that of the other OECD countries. *Figure 2.5* and *2.6* can help us to have a look at the situation in the last few years. It can be noted that, considering temporary contract, there is not much difference amongst Portugal in 2013 and the other countries in the same year, while in *Figure 2.5* are reported the degree of regulation on individual contract of the European countries, we notice that Portugal is still, among those analysed, the nation with the highest rigidity despite the reforms on open-ended contracts. On the other hand, between 1998 and 2013 the strictness on fixed-term contract was drastically reduced. Naturally, this means that there was a normative divergence. In fact, with the reforms of 2011 and 2014, the provisions concerning permanent contracts have been substantially changed. The protections granted to workers with an open-ended contract have been reduced, precisely through a reduction in severance pay and

by introducing among the criteria considered valid for dismissal, the poor performance of workers; this led to a reduction in the regulatory gap<sup>4</sup>.

Another country that has adopted legislation favourable to reducing worker protection in recent years has been the Slovak Republic. In 2011 the labour code was reformed with immediate and direct consequences on workers. The obligation to negotiate with government authorities in the event of collective redundancies has been eliminated, notice times have been reduced and severance indemnity has been eliminated. Subsequently reinstated with the 2012 reform, although at a lower level<sup>5</sup>.

**Figure 2.5: Protection of permanent worker indicator**



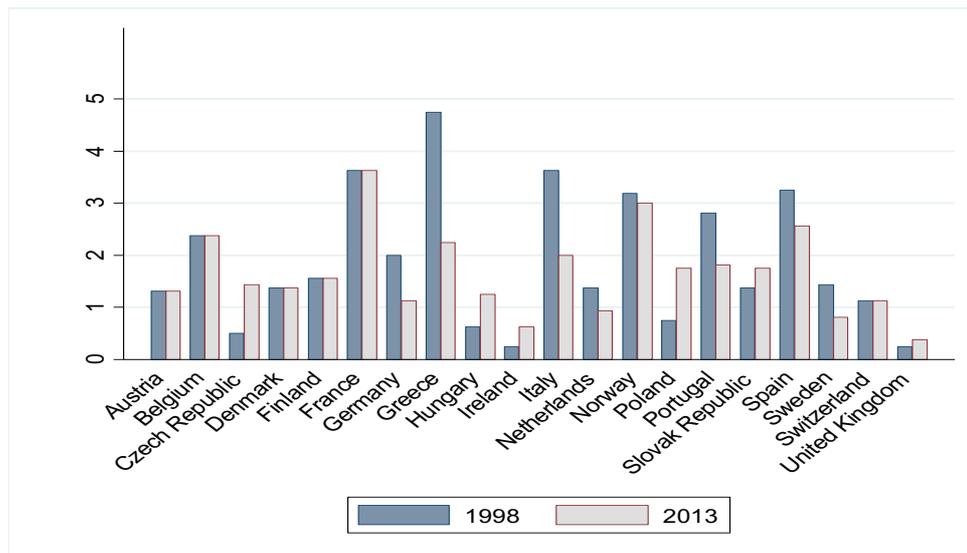
*(Note: figure shows the change in permanent worker contract's restriction for each country between 1998 and 2013)*

*Source: OECD Statistic*

<sup>4</sup> Labour Market Reforms in Portugal 2011-2015, OECD

<sup>5</sup> OECD Employment Outlook 2013, chapter 2.

**Figure 2.6: protection of temporary worker indicator**



(Note: figure shows the change in temporary worker contract's restriction for each country between 1998 and 2013)

Source: OECD Statistic

Overall, from 1998 to 2013, permanent contracts underwent a substantial loosening in regulation in most of the countries analysed; whereas, no Nations has increased his rigidity.

The situation changes if we consider temporary contracts. The sample of nations analysed can be substantially divided into three different groups:

- Who presents homogeneous indices between the two periods: Austria, Belgium, Denmark, France and Switzerland. It should be noted that, except for France, these countries have a regulation on fixed-term contracts that are very similar to each other, characterised by high flexibility.
- Who has focused their policy on higher flexibility, the main concerned are Mediterranean countries: Germany, Greece, Italy, Portugal, Spain.

The presence of Germany in this group is due to economic conditions that the country had to face at the beginning of the new millennium. We must first consider the time frame that we are evaluating. It starts in 1998 and Germany, after the EMS<sup>6</sup> currency crisis of the early nineties, had stopped playing the part of the traditional locomotive of the European economy. The unemployed had grown continuously, slowing their enthusiasm following the fall of the

<sup>6</sup> European monetary system.

Berlin Wall. In 2002 the jobless had returned above the four million marks, and at the turn of the century, there was the most extended phase of stagnation after World War II. A fundamental shock was given by the German Reform of the labour market implemented between 2003 and 2005, where in exchange for a reduction in the rigidity of EPL followed by an efficient system of relocation of jobless, Germany has once again returned to the role of leading economy, and the numbers of unemployment have returned to optimal levels.

- The last cluster is composed by those countries that have increased their temporary contract strictness: Hungary, Ireland, United Kingdom, Poland and Czech Republic. It can be noted that in 1998 everyone had a low index of fixed-term contracts regulations. To reduce the gap between different contracts and to try to overcome the problem of over-use of fixed-term contracts with a consequent increase in precariousness, various reforms have been made in these countries.

The areas that have been most reformed since 2008 are those concerning the limitation of the possibility of reinstatement in case of unjustified dismissal and the extension of the duration of the trial period. Policymakers positively view these results. The same literature agrees that the efficiency of work's reallocation and productivity depends mainly on these factors.

The theoretical models that have suggested the introduction of measures to ease labour market rigidity are based on the opportunity to facilitate the change of the workforce on the optimal levels for the company, adjustment that would allow efficient job creation throughout the economic system.

Analysing different economic system, we should consider various perspective with a multitude of implications.

In a framework where extended protections to permanent workers are accompanied by mild fixed-term contract regulations, wage pressures and consequently the unemployment rate could increase, based on the assumption that insiders can increase their salary claims without significant risks of losing their jobs. As a result, the effects on the equilibrium of the economic system will be suffered by the least guaranteed workers.

If the use of temporary contracts is liberalised, or facilitated, while strict regulation of long-term contracts is maintained, companies will be induced to replace permanent workers with temporary contracts, without long-term effects on occupation<sup>7</sup>. When we start from a model based on uncertainty, a move from a sufficiently rigid to a two-tier regime should be associated with a fall in average productivity but a transitional increase in employment. The fall in average productivity is a direct consequence of the decreasing in marginal returns. Italian labour market, for example,

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<sup>7</sup> Two-tier employment protection reforms: The Spanish experience Samuel Bentolila, Juan J. Dolado and Juan F. Jimeno.

experienced a decline in inaction as temporary contracts expanded and a negative association between average productivity and temporary contracts (Boeri & Garibaldi, 2007). Fixed-term contracts introduced into a system of this type have an adverse effect on workers who have just entered the labour market. They minimise the likelihood of conversion into an indefinite contract, transforming what should be an opportunity to improve their skills in a sort of trap that reduces motivation and commitment, leading to: a reduction in the worker's willingness to invest in specific company's requirements, and increases their work stress. The effects of regulations on time contracts cannot be assessed separately from the complex of protections offered to typical contracts. Temporary contracts often respond to specific and temporary business needs, and their excessive limitation can be burdensome for companies.

#### 2.1.4 The potential effect of the employment protection legislation

##### *2.1.4.1 EPL and flexibility*

One concept related to EPL is the flexibility. The theory of flexibility has been the subject of many studies that have investigated, in recent years, the relationship between the degree of flexibility and the level of employment and unemployment.

It is shared in the literature that a more flexible work responds better to the needs of cost containment and efficiency recovery of companies<sup>8</sup>. However, there could be adverse effects on the global demand caused by labour market flexibility. In fact, the uncertainty of the income received, almost inevitably affects the aggregate demand level, either directly (due to a lower propensity to consume with the same income earned), or through a lower debt capacity.

Equally complex are the effects on employment, mediated by the impact of labour regulation on productivity: on the one hand, the greater ability to calibrate the workforce on the needs and perspectives of innovation and technological progress seems to positively affect productivity, on the other hand the (relative) greater convenience of labour-factor could lead to a (relative) preference for work with respect to fixed capital, so that a slowdown in productivity growth cannot be ruled out. Another channel through which labour flexibility could impact on economic growth and, consequently, on employment, is identifiable in the risk that the limited work stability disincentives both companies and workers to invest in vocational training.

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<sup>8</sup> For the company, the greater flexibility of its workforce is a desirable situation.

#### *2.1.4.2 EPL and turnover cost*

Workers employed in a company enjoy certain advantages over the unemployed. The company makes typically an investment in the labour force, which includes all costs for selection and training in both: general and specific skills. Therefore, this means that the work can be considered a quasi-fixed factor (Oi, 1962). For workers employed in the firm (that take the name of “insider”), the company has borne these costs; for workers that the company could hire (that take the name of “outsider”), these costs have not been yet incurred. Labour market regulation plays an important role defining the costs that the company should bear due to the turnover of workers. In fact, the firm, especially in European countries, is not completely free in the management of employment contracts. Moreover, sacking is often regulated and usually procures costs, the company's unfair behaviour towards workers can bring consequences regarding strikes and less effort during the work; firing them is not always possible. Replacing a worker leads, in any case, to costs. The more specific the training and the more regulated the market is, the higher the costs will be. The productivity of the newly hired can depend on the behaviour of the insiders, and, from their collaboration in the production process. “Hiring a worker is a risky proposition, and the degree of uncertainty about the future is a crucial parameter in the firm's problem.” (Bentolila & Bertola, 1990). Given this setting, job security provision should either lower the labour’s demand and the employment for a certain level of wage or should lead to higher wage at the expense of lower employment. Empirical evidence has demonstrated that job security provision contributes to less turnover and job reallocation in the short-run, with direct consequences in the composition on the employment level, this means stagnation in the level of unemployment correlated to less change in employment (Nickell and Layard, 1999). However, on the other hand, considering the long-run period, the effect of higher worker protection related to turnover seems to disappear, i.e. the level of wage and employment appear to be mainly influenced by other job market characteristics (Bentolila & Bertola, 1990). For what concern the direct effect on employment, has been analysed that dismissals are much more regulated in Europe than in North America but despite this the hiring and firing rates are similar in the two continents. The solution to this puzzle has been given by “Boeri 1999”. He found that rigid labour markets may seem flexible. This is due to their regulation that reduces flows from employment to unemployment and leads to more massive job-to-job shifts of workers involved in redundancies; these shifts affect competition for jobs between employed and unemployed job seekers, but with a threshold on the number of hires from the pool of the unemployed.

#### *2.1.4.3 EPL and the level of employment*

For several years, many economists have attributed to the rigidity of the labour market an essential role in explaining the differences between countries, in employment and unemployment rates, as well as in the duration and composition of the latter. Some studies sustain that when we are in the presence of strict employment protection regulations, there is a significative increase in the probability of unemployment rates. In fact, this form of regulation appears to have positive effects on youth and long-term unemployment. At the same time, also other instruments for increasing the employment power seem to have an identical effect. One of them is the worker bargaining power (S. Scarpetta, 1996).

In models with adjustment costs, labour rigidity is interpreted as a cost that the company should pay to adjust its labour to the optimum level. According to this setting, the effect of stiffness is no direct on employment (and therefore on unemployment) average, because if, on the one hand, it reduces the propensity of companies to take more workers, on the other hand, it induces to reduce as little as possible the workforce in the face of negative shocks. This implies, however, a loss of efficiency and therefore lower average profits for businesses. Greater rigidity also leads to less variability in employment and unemployment during the economic cycle, a longer duration of unemployment and, therefore, more significant difficulties in accessing the labour market for young people and, in general, for the weakest segments of workers.

According to other economists, the role of rigidity should be considered with caution. There is no direct evidence that stricter labour standards or employment protection lead to higher unemployment or a lower employment (S. Nichel & R. Layard 1999). In fact, employment protection legislation is only one of the different factors that may influence the employment rate. Some other instruments such as active labour market policies might limit the harmful effects of EPL on hiring rates<sup>9</sup>. Others, such as the generosity of unemployment benefits and their duration, the role of the trade union or the level of the total tax burden can have an essential role in determining the labour market condition.

#### *2.1.4.4 EPL and youth employment*

The provisions on occupational safety affect the redundancy rates of employees, lowering the threshold. The cause of layoffs is generally due to a decline in worker productivity that may be temporary or permanent. This decrease forces employers to deal with losses caused by a lack of

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<sup>9</sup> OECD "EMPLOYMENT OUTLOOK 2004"

efficiency. When such losses result relevant and start to weigh heavily on the profits of the enterprise, the employers are forced to resort to the dismissal, having to face all the expenses that derive. It follows that the redundancy will only occur when the costs arising from this procedure are higher than the losses resulting from the lack of productivity, that will always be higher the more present on the market is the legislation on worker protection. Returning to the shock factors that determine the drop-in yield, they can depend on the behaviour of the workers or, in some cases, by external factors not subject to control by the actors involved, such as a decline in demand for products, which makes its anticipation and prediction difficult. Being expensive, the costs arising from the dismissal of workers lower the rates of dismissal but at the same time reduce the possibility of employment. In fact, when employers decide to hire new workers, they must take into account and anticipate the costs of dismissal with a given probability. Therefore, assuming it becomes risky, due to the information asymmetry, a worker might initially seem more productive than he is. This will lower the expected usefulness of hiring an additional worker lowering, consequently, the recruitment rates. As we said earlier, this involves reducing turnover and lengthening employment periods alongside those of unemployment. Many authors have argued that an increase in labour security rigidity shifts the risks of unemployment towards young people. (OECD 1994, 2004, 2006; Bertola 1999; Allard & Lindert 2006; Cahuc & Zylberberg 2004; Breen 2005). Unemployment is mainly concentrated among the demographic groups that are most at risk, such as those who finished the school want to enter in the labour market. These will take more time to find the first job even if temporary. The whole process if too long could lead to discouraging the interested party by making it more distrustful and reluctant to seek employment. Of course, the other side of the coin suggests that once a first occupation is found, there is a higher chance that the period of this activity will be longer. With consequent incentives for the employer to invest in the formation of human capital that should further reduce the risks of youth unemployment. Indeed, an effect that should be taken into account when there is an increase in the duration of the employment periods is the opportunity to invest in both specific and general skills on the part of young people and employers. This is because an increase in human capital thus increases worker productivity, benefiting the entire company and not just individual employees. Besides, with the improvement in their specific skills, young people see their risk of unemployment decreasing. Therefore, under this precise perspective, deregulation in the labour market would destroy incentives to invest in human capital and harm young people and their prospects in the labour market. As long as these effects are conflicting, it would be difficult to analyse them and arrive at a satisfactory conclusion with the sole aid of economic models. To verify which of the two effects has the upper hand we must proceed with an empirical analysis, proposed in this dissertation in the last chapter.

A good alternative by employers to face an increase in costs due to the employment of workers with an open-ended contract is to adopt different types of contracts, for example using temporary contracts. These, in fact, turn out to be an alternative use that increases flexibility without imposing costs of dismissal. A direct consequence of the liberalisation of the formula for fixed-term contracts is, on the one hand, an increase in the employment rates due to a reduction in the costs of dismissal. On the other hand, an increase in employment loss rates will have to be addressed, due to the temporary nature of new contracts. Business relations will be characterised by more transitions. Therefore, we can divide the outcomes into two macro areas, advantageous results and negative consequences. Indeed, on the one hand, deregulation could nullify the negative effects of tight regulation on young people. Generating the creation of new jobs for young people and accelerating the transition to the first job, making youth unemployment lower. Conversely, there could be a stimulation of the job demand with consequent reduction of salaries on temporary workers. Besides, young people, fearing job loss and unemployment, may agree to be underpaid with the hope of converting their contract from temporary to permanent. This would consequently translate into salary flexibility that could be the real and only actor in guaranteeing higher employment levels. In fact, the literature suggests that the deregulation of temporary contracts leads employers to merely replace positions covered by fixed contracts with temporary ones (Blanchard & Landier 2002, Cahuc & Postel-Vinay 2002, Kahn 2010). In fact, when there is partial deregulation of contracts, i.e. related only to fixed-term contracts (while the regulatory provisions for other types of contracts remain unchanged), the incentive for companies to convert fixed contracts into permanent contracts will be reduced. Employers will want to avoid increasing the bargaining power of workers which would result in higher wage demands. As a consequence, young people will be forced to repeat periods of temporary work alternated with unemployment with increasingly reduced possibilities to see their contract converted.

## 2.2 Product market regulation

The product market is governed by regulatory provisions through which the public apparatus pursues aims of general interest. The main reasons behind the regulation of the product market are to be attributed to the various market failures, which mainly include natural monopoly conditions, information asymmetries and externalities. However, there are other mechanisms that can influence and increase participation and public intervention in the market. The presence of interest groups that operate for the sole purpose of increasing their income can be an example. The implementation of some rules can sometimes detach from the objective of primary public interest, getting closer to the protection of the interests of these groups.

The regulations themselves, under certain conditions, may be the cause of market failure, in fact, they could result in far greater costs than expected benefits. It is therefore not easy to estimate with certainty what may be the effects of regulations on labour market trends, this complexity is because these effects are mediated by the behaviour of the market itself, by the labour market institutions and by the industry structure. An example of a legal impediment is entry barriers that limit the number of competitors that can enter the market, favouring those already present. These restrictions are linked to policies of various kinds, commercial or international investment, which reduces the competition of foreign companies through tariffs or legal limits on foreign ownership. Poorly designed entry rules cause higher inefficiencies in markets characterised by imperfect competition, affecting effective competition. Furthermore, by restricting competition in the product market, restrictions on foreign competitors could lead to lower output and employment growth which adversely affect long-term employment levels (Krueger 1998).

A drastic competitive decrease in the product market would have direct repercussions on job demand. Companies would have higher profits than a market dominated by perfect competition. Therefore, the existence of higher profits would push workers to demand a higher salary. At this point, companies would find themselves optimising their profit function by choosing the right amount of capital and labour, but the increase in labour costs would lead to greater capital investment, leading to lower employment. In conclusion, entry restrictions will negatively affect economic efficiency. With unfavourable effects on employment and its composition.

### 2.2.1 Product market regulation and labour market

The public regulation of the goods market has the effect of restricting access or the birth of new businesses by increasing entry barriers, through direct costs or bureaucratic constraints, legal limitations on the number of companies and access to the market of foreign companies.

Regulatory reforms could lead to more competitive markets, when this happens, the gap between prices and marginal costs is reduced and in the absence of other distortions that may affect the market differently, the allocation of goods and resources will become more efficient. The optimization of resource allocation will lead to more competitive markets and as a result there will be an allocation of capital and labour almost entirely dedicated to the production of those goods that consumers value the most. Naturally, greater competition on the market will lead to a closure of the market to less efficient companies, so that only the most productive companies will survive, with a consequent general increase in market efficiency (A. Alesina et al. 2005).

We must distinguish three different types of classification within public market regulation:

- Type of restriction: imposition of barriers to entrepreneurial activity, control of companies by the State and barriers to trade and international investments.
- Function: regulation can be administrative or economic. The first concerns the information, procedures, charges for starting a business or for requesting authorisations, concessions, licenses. The second includes state control, legal barriers to competition or investment.
- Scope: regulation can concern an entire economy or just a specific sector.

If we focus on the level of companies, we can divide their life into three parts: entry into the market, growth and exit from the market. All three phases are characterised by rules and procedures of an administrative and economic nature, which entrepreneurs must follow and respect.

Although these procedures are slightly different between states in quality or quantity, they are nonetheless heavy and often disincentive. Sometimes the barriers are not only bureaucratic obstacles, but real prohibitions to enter a market. Therefore, the regulation of the goods market may be seen as a whole of rules that place impediments within an economic-productive context.

These barriers may have the purpose of affecting the structure market or the entry of new companies, by: laws that limit the number of competitors in a given sector or give an unfair advantage to some of them; structural provisions, which make more difficult for some companies to access supplier networks (vertical integration); administrative burdens that impose fixed costs to operate; policies that create impediments to international trade and investment (G. Nicoletti & S. Scarpetta, 2003)

For example, lower trade barriers can generate a reallocation of resources; this reallocation consents the more efficient firms to become more productive, with a consequent exit from the market by the lowest efficient. When less capable firms come out of the market but at the same time new (more efficient companies) come in, a total productivity growth is generated (Marc J. Melitz, 2003). It is for this reason that the use of barriers limits the raising of the market efficiency, representing a market failure.

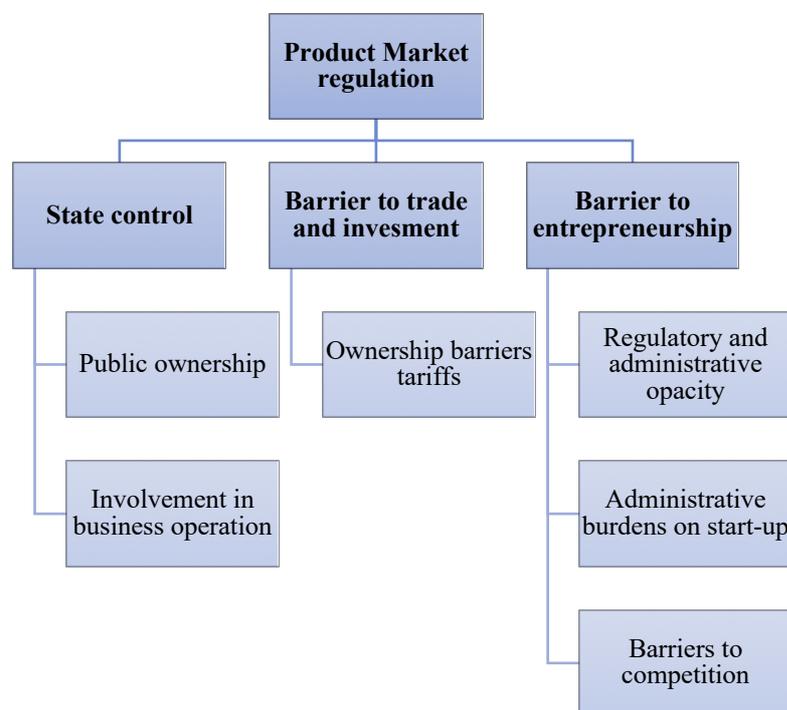
### 2.2.2 Indicators and reforms on product market regulations

How can we summarise the regulation on the market of goods from an economic perspective?

OECD gives the answer. To allow a comparison amongst European countries and to analyse more in-depth their economic system, the OECD summarised various indicators based on the information resulted from questionnaires distributed to the officials of the Member Countries.

The indicators of PMR are not based on opinion polls and for this reason they are considered "objective". Furthermore, they are directly focused on policies and follow a bottom-up approach, in which each country is assigned a score that can be related to specific policies. They do not focus solely on particular sectors but cover the product market rules affecting the economy in general and are controlled by the national administrations of the member countries of the OECD. In the *Figure 2.7* we can see a summary of PMR low-level indicators. Each of the low-level indicators captures a specific aspect of the regulation.

**Figure 2.7: table of product market regulation indicator**



Source: OECD

The regulation of the product market has been analysed on three main factors:

- Regulatory barriers to international trade and investment, through explicit legal and tariff provisions;
- Direct state control of economic activities, through state participation or other types of interference in the decisions of companies in the business sector and the use of command and control regulations;
- Obstacles to private business activity, through legal restrictions on access to markets or administrative burdens and opacity that hinder the creation of businesses.

Using these summary indicators, we are now able to compare and distinguish PMR levels between member nations and to see the evolution of their regulations over the last 20 years.

Three groups of general product market regulation could be established in 1998 in Europe: a group oriented towards a more flexible model with fewer market impositions, which see Britain as a leader, Ireland and Denmark also belong to this category. A second group, characterised by relatively liberal outward-oriented policies, composed predominantly by the European continental States, in detail: Finland, Germany, Iceland, Netherland, Norway and Sweden. Last but not least, a group with relatively closed external policies (among which Portugal, Greece and Poland stand out).

On the other hand, observing the data relating to 2013 along with the data in 1998, two considerations can be made:

1. The situation from the point of view of regulation between the European countries from 1998 to 2013 would seem to have followed the same direction, translated into a drastic reduction of regulatory rigidity.
2. The level of narrowness among the countries appears to be more evenly distributed, in fact, looking at the *Figure 2.8*, it can be seen that in 2013, no member country has excessive levels of PMR.

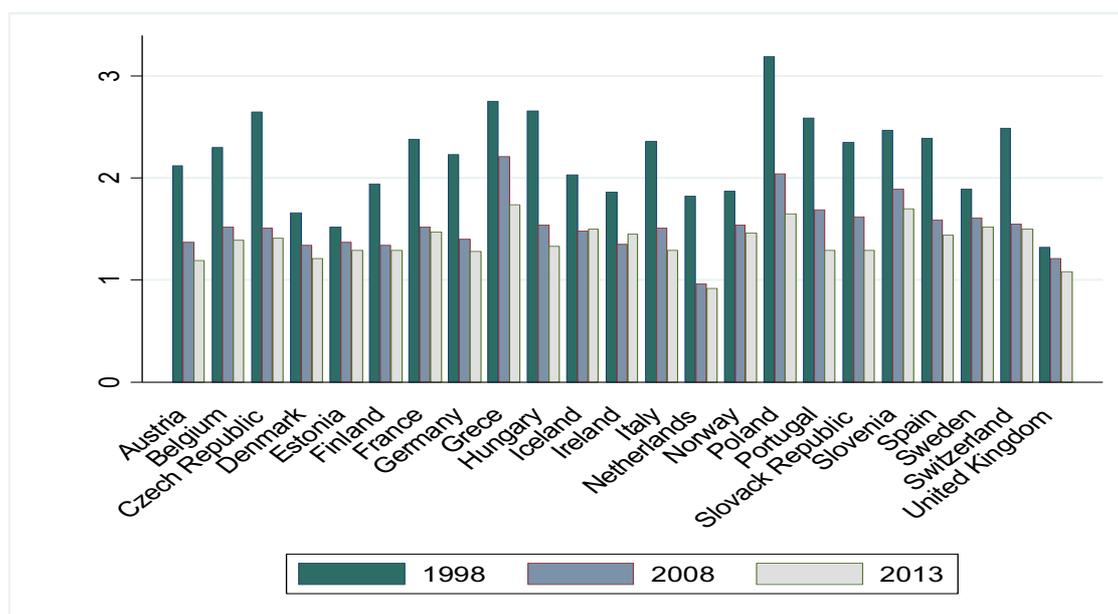
The leading causes that drove to this result are to be found in the role that the European community has played in recent years and the impact of the economic crisis in Europe. First of all, we need to remember that in 1998, there were 15-member states in the European Union, about half of those that composed the community in 2013<sup>10</sup>. It must be underlined how the conception of the community has been outlined and affirmed in the common imaginary in recent years, also thanks to the introduction of the euro. We must also consider the numerous achievements in terms of harmonization from different points of view have been reached (free movement of human capital, free trade, free movement of people). All these factors, along with the obligation to respect the constraints established in the various treaties, have influenced the regulatory dynamics in the market of goods in the various states.

In the *Figure 2.8*, we can see the evolution of the PMR in three different years, respectively in 1998, 2008 and 2013. The decision to include 2008 in the analysis arose from the desire to examine the effects of the crisis on regulation. In almost all the countries considered, between 1998 and 2008 there was a drastic tendency to reduce rigidity, while less significant changes were recorded between 2008 (the year when the economic crisis broke out in Europe) and 2013.

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<sup>10</sup> To see the chronology of the enlargement of the European Union go to the appropriate section of the appendix

**Figure 2.8: Product market regulation over time**



(Note: figure shows the change in the strictness of product market regulation for each country in 1998, 2008 and 2013)

Source: OECD Statistic

Remaining consistent with the outcome found previously, the countries that experienced more restrictive regulation in 1998 (Poland, the Czech Republic, Greece, Italy, France, Hungary and Spain) recorded a significant improvement in the PMR. In addition, progress has been achieved in several areas evaluated by the various sub-indicators.

Countries that were estimated to be “relative liberal” in 1998 (U.K, Ireland and Denmark) have recorded small improvement in PMR, and at the end, countries that were defined as “in the middle” of PMR strictness (Iceland, Netherland, Sweden, Germany, Austria, Belgium, Finland, Switzerland), recorded medium-large deregulation. Substantial improvements were made in moderating the barriers to competition in all sectors reported by the PMR indicators.

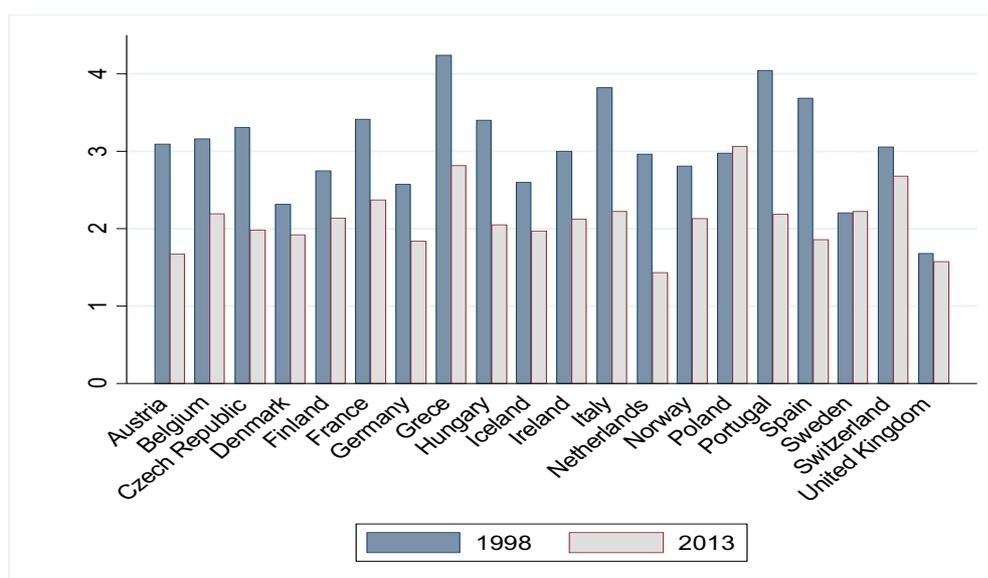
In particular:

- **State Control:** For “restrictive countries”, the control by Government has been reduced dramatically. This reflects the removal of price controls in the air transport and telecommunication sectors, while for France and Spain this decrease is mainly due to a decline in the extent of public control over companies. (P. Conway & G. Nicoletti 2006, R. Bouis et al. 2016).

For “relatively liberal” countries, the improvements have been made mainly for Ireland and Denmark. The latter reached these results by lessening recourse to command and control regulation<sup>11</sup>.

At the end we have the “middle group”, all these countries have made progress in reducing State control, as for the previous groups, this has been achieved by removing price controls and relying less on command and control, while Sweden maintained its status quo.

**Figure 2.9: State control indicator**



(Note: figure shows the change in State control sub-indicator restriction for each country between 1998 and 2013)

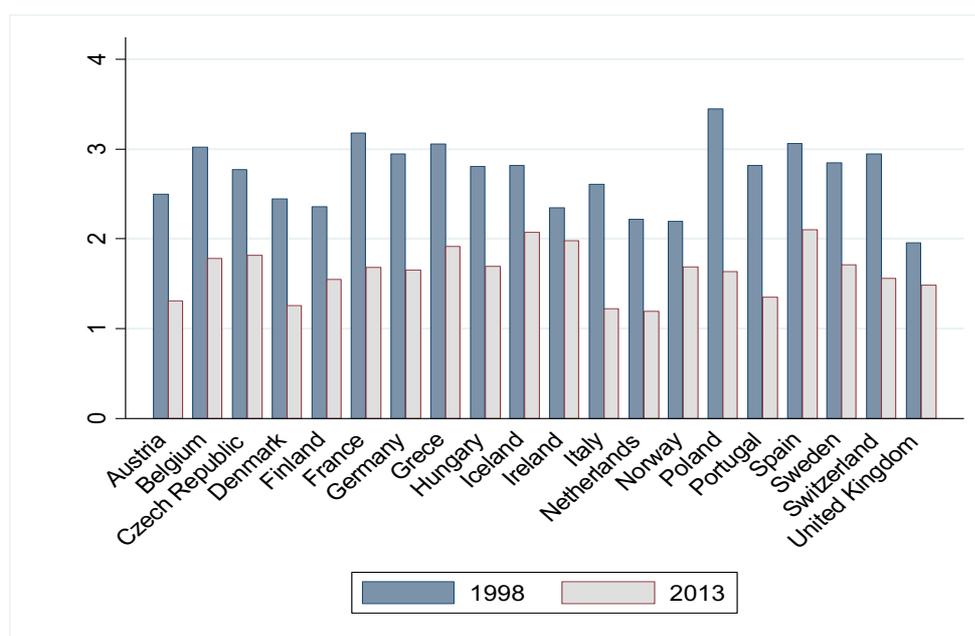
Source: OECD Statistic

- **Barriers to entrepreneurship:** Italy, French and Spain have made substantial progress. This progress was mainly due to a reduction in the administrative burdens on start-up. Poland and Italy also removed legal barriers to entry in some sectors, while Greece has improved the system of licenses and permits (P. Conway, V. Janod, G. Nicoletti 2005, R. Bouis et al. 2016). For what concern “relatively liberal” countries, their progress depends mainly on reductions in administrative burdens.

Last but not least, we have the “middle group”, where Sweden and Finland improved the system of licenses and permits, while Norway and German have lowered administrative burdens.

<sup>11</sup> Command and Control (CAC) regulation can be defined as “the direct regulation of an industry or activity by legislation that states what is permitted and what is illegal”

**Figure 2.10: Barriers to entrepreneurship indicator**



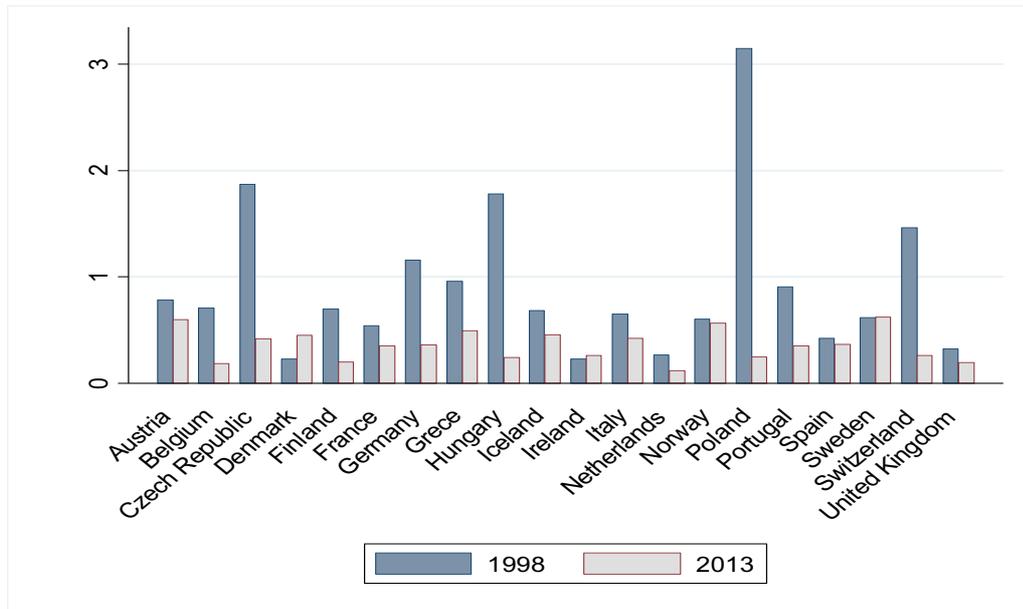
(Note: figure shows the change in barrier to entrepreneurship sub-indicator restriction for each country between 1998 and 2013)

Source: OECD Statistic

- Barriers to trade and investment: for what concern this category, the changes were almost imperceptible, except for the “relatively restricted” countries, as we can see from the *Figure 2.11*.

We can see that especially Poland, Czech Republic and Hungary, have made drastically change. In Czech Republic and Poland, these results have been reached thanks to explicit recognition of the national treatment principle and the access for foreigners to regulatory appeal procedures (P. Conway, V. Janod, G. Nicoletti 2005, R. Bouis et al. 2016). This is an evident influence of the accession to the European Union.

**Figure 2.11: barriers to trade and investment indicator**



*(Note: figure shows the change in barrier to trade and investment sub-indicator restriction for each country between 1998 and 2013)*

*Source: OECD Statistic*

In conclusion, in the last 20 years have been made drastically change in Product market regulation in all its form with the purpose of improving market efficiency. In particular, such reforms have characterised the market structure of the “relative restricted countries”.

### 3 Theoretical model

The following chapter wants to give a brief analysis of a model built by Blanchard & Giavazzi, which highlights the role of regulations and deregulation on both goods and labour market. The conclusions at the end of the chapter will be used as a theoretical basis for empirical analysis.

The theoretical analysis is based on the study of an economy in which several companies produce differentiated products, using only the labour. The model will be based on two main assumptions: the labour's supply is defined by a monopolistic competition of the product market, while the labour's demand by efficient bargaining in the labour market.

Monopolistic competition is the market structure in which many sellers are present, offering a similar but not identical product. The product of one firm is different from that of other companies active in the same market, so its demand curve has a negative slope; therefore, to maximise profit, the competitive monopolistic company determines the quantity produced by making the marginal cost equal to the marginal revenue and defines the price based on demand, so that it is consistent with this quantity. In particular, in the model that we are going to analyse, the only source of profit that companies have resides in their product differentiation capacity; the more they are able to raise the price of their product considering the willingness to pay of consumers, higher their market power is. Another assumption that we must consider is the efficient bargaining in the labour market, which determines the distribution of the rents between firms and workers. In modern societies, the bargaining power of workers is represented by the presence of trade unions, these organisations are personally involved in dealing with companies for a fairer distribution of profits.

### 3.1 Regulation

We have already explained in the previous section the meaning behind this term; now we are going to show how the effect of this factor is taken into account by O. Blanchard & F. Giavazzi<sup>12</sup>. In the model, regulation is produced by three fundamental parameters:  $\beta$ ,  $\vartheta$  and  $c$ .

$\beta$  reflects regulation in the labour market, i.e. the bargaining power of workers, which is expressed in the appropriation of a portion of the income that companies obtain in markets that are not perfectly competitive. The maximum expression of workers' market power is the trade union that works to try to limit the choice of companies. The main action is the joint regulation of working conditions, which is carried out mainly through the stipulation of collective agreements, increasing the power of workers. These elements of rigidity contribute to increasing  $\beta$ . While  $c$  and  $\vartheta$  reflect the two dimensions of regulation in the goods market; they generally have the effect of restricting access or the birth of new businesses, through bureaucratic limitations and licenses. In particular,  $\vartheta$  may indicate barriers to international trade and investment that can be classified into: legal and administrative barriers to foreign ownership of businesses, existence of explicit provisions discriminating business activity on the basis of nationality, average trade tariffs and the incidence of non-tariff barriers to trade (G. Nicoletti & S. Scarpetta, 2003).  $c$ , on the other hand, represents the entry cost, a decrease in  $c$  may come from a reduction in the degree of control exercised by legislative bodies over state-owned business sector enterprises

### 3.2 Temporal analysis

The model is based on three different levels of temporal analysis, partial and general short-term equilibrium, and the effects of the interaction between the labour and product market in the long-run. The difference between the two levels of equilibrium in the short-term is that, in the partial stability the total level of the output defined by  $Y$ , the general price level identified with  $P$ , and the unemployment rate  $u$ , are considered exogenous. For this reason, the employment level and the reservation wage are established ex-ante. Furthermore, it is established the condition under which the number of firms in the market has to be fixed (there are no companies that enter and leave the market). Moving to the second equilibrium, we need to introduce the condition that  $P_i / P = 1$ . Now the unemployment rate varies in a way that the reservation wage appears to comply with this assumption.

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<sup>12</sup> O. Blanchard & F. Giavazzi (2003), "Macroeconomic Effects of Regulation and Deregulation in Goods and Labour Markets"

The number of companies, which is still considered exogenous, remains unaltered. In the end, there is the long period. Unlike the short-run, where the real wage and the number of companies have no effect on employment decisions, now these factors are determined by the model itself. The number of companies along with the number of products varies to satisfy the entry conditions. The distribution of income between companies and workers in the short term determines the number of companies in the long-term equilibrium. Now let's analyse in detail the economic agents that are the protagonists of the model.

### 3.3 Workers and firms

The number of companies is assumed to be exogenous in the short term, while the number for the medium term is endogenous. This distinction makes it possible to highlight the role played by the distribution of income in determining the optimal number of companies on the market. The degree of competition in the product market is determined by regulation that mainly acts through entry costs for companies, while the labour market establishes the bargaining power of workers. In this framework, there are  $L$  workers, considered at the same time also consumers and indexed with the letter  $j$ . In each period, each worker has a utility function:

$$V_j = \left[ m^{-\frac{1}{\vartheta}} \sum_{i=1}^m c_{ij}^{\frac{(\vartheta-1)}{\vartheta}} \right]^{\frac{\vartheta}{(\vartheta-1)}} \quad (3.1)$$

$$\vartheta = \bar{\vartheta} g(m) \quad g'(\cdot) > 0$$

$m$  indicates the number of goods consumed and the related companies present in the market, indexed with the letter  $i$ ,  $\vartheta$  indicates the elasticity of substitution between goods (this variable depends positively on the variety of the number of existing products);  $\bar{\vartheta}$ , instead, it is a constant that summarises all those factors representing the regulation that are able to influence the elasticity of substitution. From the utility curve two fundamental implications can be obtained, the first is that under the condition for which the workers consume all the products in the same quantity, with consequent equality between  $C_{ij} = C_j/m$  (hypothesis of symmetrical consumption), the utility function will be  $V_j = C_j$ . Therefore, the number  $m$  of the products does not directly affect the utility of the consumer. On the other hand, the increase in the number of products will affect the elasticity of substitution by increasing it. In every period, the worker can offer one or zero units of work and spend all the gain in consumption. Assuming, in fact, that the consumer spends all his wage, we are

consequently arguing that there are no savings and therefore there is no presence of capital in the model. The worker's budget constraint is:

$$\begin{aligned} \sum_{i=1}^m P_i C_i &= W_j N_j + P f(u)(1 - N_j) \\ f'(u) &< 0 \end{aligned} \quad (3.2)$$

$N_j$  corresponds to the offered job, if it is equal to 1 the equation of the budget constraint is satisfied by the first term on the right because the second is cancelled. While in the case  $N_j$  is equal to 0 it will be the first term to be removed, with a budget constraint that will depend on  $f(u)$ .

$f(u)$  corresponds to the worker's reservation wage, which is inversely related to the unemployment rate, captured by  $f'(u) < 0$ .  $W_j N_j$  represents the monetary value of consumption.  $P$  is the price index associated with consumption:

$$P = \left[ \frac{1}{m} \sum_{i=1}^m P_i^{(1-\vartheta)} \right]^{\frac{1}{(1-\vartheta)}} \quad (3.3)$$

Under consumption symmetry assumption ( $C_{ij} = C_j/m$ ) and reminding that  $C_j = V_j$  the utility function implies that:

$$V_j = N_j \left( \frac{W_j}{P} - f(u) \right) + f(u)^{13} \quad (3.4)$$

Each company produces one product, so its production function will be:  $Y_i = N_i$ . Moreover, as for workers, entrepreneurs who earn profits will spend them entirely on consumption. For this reason, the assumption of a model characterised by the absence of capital is maintained. The nominal profits will be for the following companies:

$$\Pi = P_i Y_i - W_i N_i = N_i (P_i - W_i) \quad (3.5)$$

According to the consumer utility function, the firms will have a demand function given by:  $Y_i = \left( \frac{P_i}{P} \right)^{-\vartheta}$ , where  $Y$  is the aggregate demand and  $\vartheta$  is the elasticity with respect to the relative price.

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<sup>13</sup>  $\sum_{i=1}^m P_i C_{ij} = W_j N_j + P f(u)(1 - N_j)$   
 $\frac{C_j}{m} \sum_{i=1}^m P_i = W_j N_j + P f(u)(1 - N_j)$   
 $C_j = N_j \left( \frac{W_j}{P} - \frac{P f(u)}{P} \right) + f(u)$

### 3.4 Bargaining power: workers and firms

The company, in each period, contracted  $L/m$  workers. The bargaining scheme chosen is the Nash's bargaining where the company and the workers together simultaneously determine wages and level of employment to maximise the differential utility of the workers and the company's profitability. Within the model considered, the logarithm of maximising Nash is used:

$$\beta \log[(W_i - Pf(u))N_i] + (1 - \beta)\log(P_i - W_i)N_i \quad (3.6)$$

The first term represents the surplus that the worker perceives working in the enterprise  $i$ , following the hypothesis of symmetry consumption. The second indicates the profit of the company  $i$ , and the term  $\beta$  represents the bargaining power of workers<sup>14</sup>.

### 3.5 Short-run and long-run equilibria

#### 3.5.1 Short-run partial equilibrium

As mentioned earlier, in the short-term  $P$ ,  $Y$  and  $u$  are exogenous variables, so the workers and the company choose the price  $P_i$ , the employment  $N_i$  and the wage  $W_i$  to maximise the 3.6. In this analysis the production function  $Y_i = N_i$ , where  $Y_i$  is given by:  $Y_i = \frac{Y}{m} \left(\frac{P_i}{P}\right)^{-\theta}$ . From maximisation, we have the equality of the marginal revenue of the worker with the reserve wage.

$$\frac{P_i}{P} \frac{1}{1+\mu(m)} = f(u) \quad (3.7)$$

with  $\mu(m)$  the mark-up on the reservation wage given by:

$$\mu(m) = \frac{1}{\theta g(m)-1} \quad \text{with } \mu'(m) < 0$$

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<sup>14</sup> The efficient bargaining hypothesis is important because it allows the "stronger" workers to obtain a higher salary without lowering the employment level.

So, from the previous equations, we can observe the relative price chosen by companies and workers:  $\frac{P_i}{P} = f(u)(1 + \mu(m))$ . Analysing what we have achieved, we can see that the real price of the product is selected based on the mark-up and the real reservation wage. The latter depends on the companies' number  $m$  and the elasticity of the product demand curve. Maximising again 3.6, this time compared to the  $W_i$  wage, we get that, the real wage is given by<sup>15</sup>:

$$\frac{W_i}{P} = (1 - \beta)f(u) + \beta \frac{P_i}{P} \quad (3.8)$$

3.8 depends on the reservation wage and the relative price. Using, the equation that identifies the relative price in that of the real wage we have <sup>16</sup>:

$$\frac{W_i}{P} = [1 + \beta_\mu(m)]f(u) \quad (3.9)$$

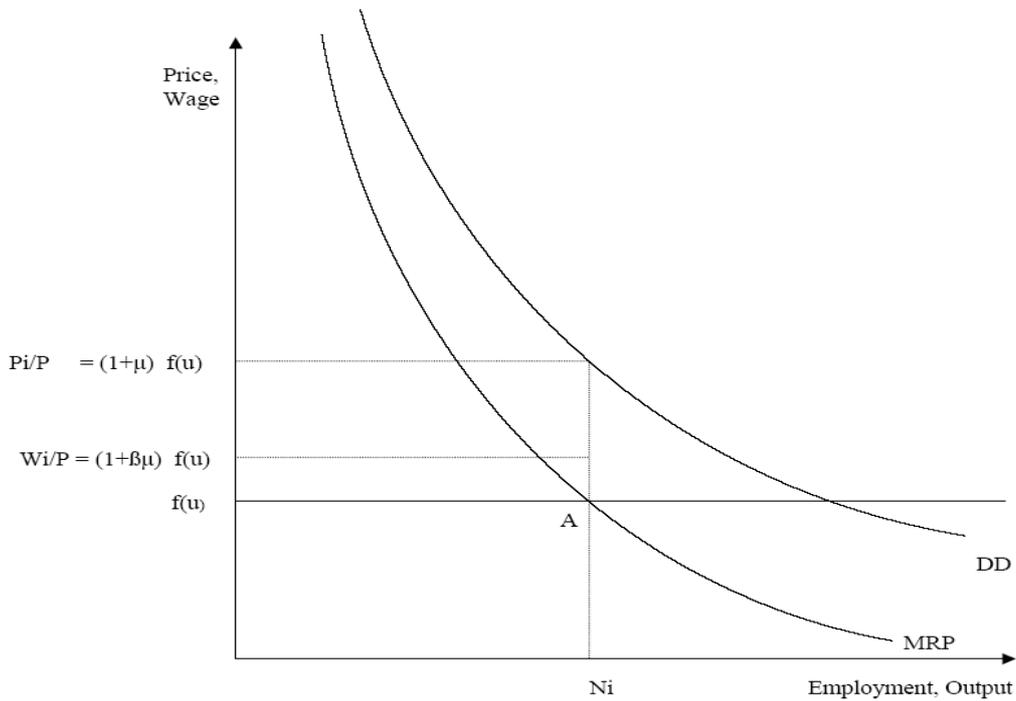
*Figure 3.1*, taken from Blanchard & Giavazzi 2003, shows the partial short-term balance. On the ordinates axis are represented relative price and the real wage, while on the abscissa axis the occupation  $N_i$  and consequently the output ( $N_i = Y_i$ ).

---

<sup>15</sup>  $\beta \frac{1}{(W_i - Pf(u))} + (1 - \beta) \frac{N_i}{P_i Y_i - W_i N_i} = 0 \Rightarrow \beta P_i + (1 - \beta)(W_i - Pf(u)) = 0$

<sup>16</sup>  $\frac{W_i}{P} = (1 - \beta)f(u) + \beta \frac{P_i}{P} = f(u)[(1 - \beta) + \beta + \beta_\mu(m)]$

**Figure 3.1: Partial equilibrium**



*Source: O. Blanchard & F. Giavazzi, Macroeconomic effects of regulation and deregulation in goods and labour markets*

By MRP we mean the marginal revenue product curve, while with DD the demand curve. As can be seen, employment and production are fixed by the condition of equality between MPR and the reservation wage  $f(u)$  in point A. Workers will receive a salary between the relative price and the reservation wage; this is shown by the 3.9, where  $\beta$  acts on the mark-up. Thus, the real wage that in the short-term does not influence the employment level, turns out to be a growing function of both  $\beta$  and mark-up. When  $\beta$  increases the real wage raises as well (up to the maximum level in which  $\beta=1$ ). While if  $u$  grows both companies and workers, even if in smaller quantities, perceive greater earnings.

### 3.5.2 Short-run general equilibrium

Now let's shift our attention to the general balance. From now on, companies will no longer be able to freely choose the relative price, as in the partial equilibrium, but they will have to undergo the condition that all prices must be equal, given the assumption of asymmetry in the model. This implies that:  $\frac{P_i}{P} = 1$  and solving again the equation  $\frac{P_i}{P} = f(u)(1 + \mu(m))$  with this new assumption we have:

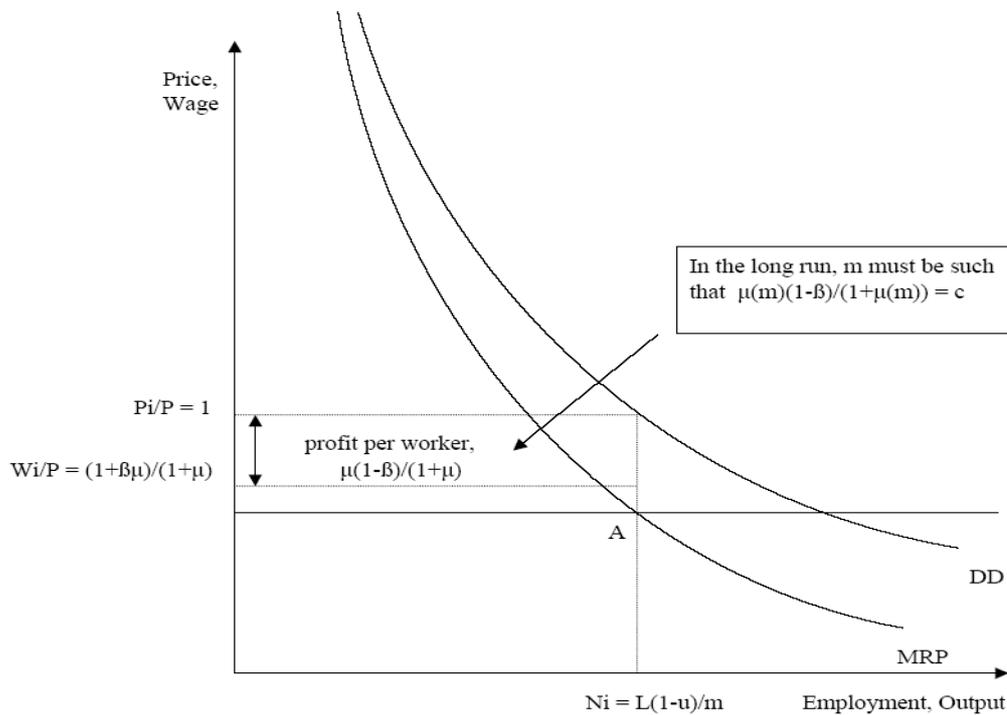
$$f(u) = \frac{1 + \beta\mu(m)}{1 + \mu(m)} \quad (3.10)$$

replacing the new reserve wage within the equation that determines the real wage:

$$\frac{W_i}{P} = (1 + \beta\mu(m))f(u) = \frac{1 + \beta\mu(m)}{1 + \mu(m)} \quad (3.11)$$

It should always be remembered that in the short-term the number of companies and the elasticity are exogenous variables and therefore the mark-up is fixed. The employment level, as in the previous case, is determined by the equality between the reservation wage and the income of the worker's marginal product. Equation 3.10 shows the equilibrium value of  $u$  and the 3.11 determines the real wage, taking into account the reservation wage and the relative price. It can be seen that, unlike the previous case, the mark-up here plays a different role. In this case, the real wage is inversely proportional to  $\mu$ . Reproducing the equation 3.11 we can see that  $\mu$  play a double effect, as the number of companies in the market grows, the mark-up will decrease, causing positive effects on the real wage. On the one hand, there will be a decrease in the numerator, but this will be attenuated by the multiplier ( $\beta$ ), on the other hand, a net change will occur in the denominator. So, a decrease in the mark-up will have a diminutive effect on both numerator and denominator but with a stronger impact for the second. So overall, a decrease of  $\mu$  would bring the real wage to increase. From an economic point of view, an increment in the mark-up level would lead to an increase in the income for businesses and the salary of workers. But also, to an increment in the price of products that allows companies to receive higher margins. remembering the assumption of consumption symmetry, the subjects earn as workers, but they lose as consumers and the second effect is stronger than the first. Regarding the effect of  $\beta$  on the model, it remains unchanged compared to the previous analysis, with the real wage still increasing in  $\beta$ . *Figure 3.2* shows the general short-run balance.

**Figure 3.2: General equilibrium**



*Source: O. Blanchard & F. Giavazzi, Macroeconomic effects of regulation and deregulation in goods and labour markets*

### 3.5.3 Long-run equilibrium

In the short-term, the real wage has no allocative powers and the employment level is not influenced by the level of corporate income. While, in the medium-term, the number of companies varies so that the profits per employee are equal to the entry costs of the market. The cost of entry is given by administrative or legal restrictions, it is not a direct cost, so it is seen as a shadow cost. The assumption carried forward in the model implies that  $c$  should be proportional to the output. Recalling from the previous analysis that profits per employee are given by the difference between relative price and real

wage we have that  $\frac{\mu(m)(1-\beta)}{1+\mu(m)} = c$ . Moreover, using the definition of mark-up, we obtain the equation that determines the number of equilibrium enterprises according to the parameters  $c, \beta, \bar{\vartheta}$ <sup>17</sup>

$$\bar{\vartheta}g(m) = \frac{1-\beta}{c} \quad (3.12)$$

Given that  $g'(m) > 0$ , the number of enterprises is a decreasing function of  $c$  and  $\beta$ . From an economic point of view this means that greater workers' bargaining power or higher entry costs reduce short-term firms' returns, which fall below the entry costs reducing the number of companies on the market until the return to equilibrium. The long-term equilibrium unemployment rate is therefore determined by the new mark-up obtained by inserting it into the defining equation  $\mu$ <sup>18</sup>:

$$f(u) = \frac{1}{1+\mu(m)} = 1 - \frac{c}{1-\beta} \quad (3.13)$$

The unemployment rate turns out to be an increasing function of  $c$  and  $\beta$ , a lower level of the two parameters will cause the elasticity to increase and the mark-up to decrease, raising the reservation wage. In the end, we have the real equilibrium wage given by<sup>19</sup>:

$$\frac{W_i}{P} = (1 - c) \quad (3.14)$$

As the equilibrium revenues of companies are determined solely by the entry costs, real wages depend on  $c$ . The mark-up in long-term equilibrium is a function of  $c$  and  $\beta$ , so an increase in costs leads to fewer companies increase unemployment. Notice how in this case the supply curve is infinitely elastic: an increase in  $\beta$  directly affects unemployment, these because a higher contractual power implies lower rents for companies; consequently, there will be fewer firms and the mark-up will be higher.

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<sup>17</sup>  $\mu(m) = \frac{1}{\bar{\vartheta}g(m)-1} \Rightarrow \frac{\frac{1}{\bar{\vartheta}g(m)-1}(1-\beta)}{\frac{\bar{\vartheta}g(m)}{\bar{\vartheta}g(m)-1}}$

<sup>18</sup>  $f(u) = \frac{1}{1+\frac{c}{1-\beta-c}} = \frac{1}{\frac{1-\beta-c+c}{1-\beta-c}}$

<sup>19</sup>  $\frac{W_i}{P} = \frac{1+\beta\left(\frac{c}{1-\beta-c}\right)}{1+\frac{c}{1-\beta-c}} = \frac{1-\beta-c+\beta c}{1-\beta} = \frac{(1-c)}{(1-\beta)}$

### 3.6 Deregulation

Let us now analyse the effects of deregulation on the goods market both in the short and long term. Suppose that the government increases  $\bar{\vartheta}$ , improving the elasticity of the demand produced, remembering from the model how this increase depends on factors that are different from the number of companies present in the market. We will have two different effects depending on the analysis we are going to carry out. In the short-term, companies that are facing an increase in demand elasticity see their mark-up decrease with a consequent rise in reservation wages. Thanks to an increase in  $\mu$ , there will be a higher level of real wages and a decrease in the unemployment rate. In the short-term, given the initial assumption that the number of companies is fixed, a reduction in entry costs would have no effect. On the other hand, considering the long-term, the positive effects of  $\bar{\vartheta}$  tend to disappear. The reduction in the mark-up leads to lowering the profit rate for companies and if this is not followed by a reduction in entry costs, fewer firms will be willing to enter the market, with a consequent decrease in the total number of companies and products. This reduction was due to the failure of some companies that due to entry costs have not been replaced. So, the main reason for the vanishing of the effects of an increase in elasticity is due to the lack of parallel deregulation of entry costs. In the medium-long-term, the mark-up returns to the pre-deregulation level as well as the profit of the companies, the real wage and the unemployment rate. In order for a specific deregulation policy to be effective, there must be parallel action on various fronts in the goods market. Reducing the entry cost for new firms would lead to an increase in the competition level. In fact,  $c$  directly affects the elasticity of demand thanks to the entry of new companies. In this way, a decrease in  $\mu$  is obtained with a consequent increase in the real wage and a reduction in the unemployment rate. However, what happens to the profits of the company? These are destined to decrease similarly to the case of an increase of  $\bar{\vartheta}$ , but this time the companies will still be encouraged to enter the market even it will face lower profits. The difference lies in the fact that through a reduction in entry costs the only ones to suffer the consequences are the incumbent, since their profits will be reduced, while the new companies will always be incentivised to enter the market until this decision does not involve negative profits. The consequence is an increase in competition level amongst companies. In this way, benefits will be obtained not only in the employment level but also by higher wages.

In this model the only dimension that characterises the labour market is given by the workers' bargaining power,  $\beta$ . We analyse the effects of labour market regulation in two different time. In the short-term a reduction in the bargaining power leads to higher profits for companies at the expense of a lower real wage, as can be seen from the 3.11, this without determining any change in employment. In the long-run, the higher profits that companies have obtained push new companies

to enter the market until the profits return to the initial level. This new increase in competition lowers the level of the mark-up with a consequent increase in reservation wages, a fall in the unemployment rate and an increase in real wages that return to the level of pre-deregulation (in fact  $W/P$  is equal to  $1-c$ , i.e. it is independent of  $\beta$ ). This result implies that the short-term wage reduction will be compensated, in the long-run, by an increase of the same amount able to bring the salary back to the initial level. Thus, the level of unemployment falls with respect to the short-term level. We can clearly see that there is a sort of inter-temporal trade-off. Lower real wage levels due to a decrease in  $\beta$  in exchange for lower levels of unemployment in the long-term.

As we said, the model is based on different assumptions, including efficient bargaining. Trying to remove this hypothesis and to consider the bargaining takes place only at the level of the salary leaving to the enterprise the faculty to decide the occupational level, we will have different solutions with respect to the previous case with a balance that will be equal both in the long and in the short-term.

The real equilibrium wage remains unchanged as well as profits for companies, while the unemployment rate is reduced. In conclusion, in the standard model the trade-off is given by lower salaries in the short-term with a higher employment in the long-term. In the case of inefficient bargaining, where companies alone determine the level of employment (right to manage), workers will benefit from a higher level of employment in both the short and long-term.

The model that has been presented shows that a good policy of deregulation must start from the goods market. By reducing the price of products, the real wage increases, because it increases its purchasing power. This policy also leads to a reduction in entry barriers, leading to a reduction in the unemployment rate. Another consequence of the deregulation of the goods market is the decrease in total profits to be shared between companies and workers, which would lead workers to be less incentivised to appropriate a proportion of these profits. This facilitates deregulation of the labour market.

## **4 The youth employment impact of product and labour market regulation: an empirical analysis**

### **4.1 Empirical literature reviews**

As we have seen from the theoretical model of Blanchard & Giavazzi (2003), the labour and product markets tend to interact with each other. This interaction produces effects that can be different depending on the time frame analysed. The purpose of this section is to test the relationship between EPL and PMR and youth employment empirically. There are numerous visions of the literature on this phenomenon, and several empirical studies have already been accomplished with the aim of analysing these variables and the employment effects. G. Nicoletti & S. Scarpetta (2005) study the relationship between the reforms in the product market and their impact on employment using the OECD countries as a sample in the 80s and 90s. In their analysis they take into account the different labour market policies and the interactions of the latter with product market reforms, assessing their combined impact on employment. They find that deregulating the product market has a beneficial effect on job demand, increasing competition and consequently having a positive influence on work over the long term. As also suggested by M. Cacciatore, R. Duval, G. Fiori (2012), the positive effect of the reforms is gradually manifested, on the other hand, possible layoffs are immediate. So, they take some time to reveal their final effects on the market.

As we have already seen the PMR refers to the narrowness and difficulty for new companies to enter the market. In particular, the study by A. Kugler & G. Pica (2003), shows how strong barriers to entry can undermine all the efforts made to deregulate the labour market to increase employment. They use a model indicating how the impact of redundancy costs is mitigated if entry barriers are more pronounced. A direct consequence of this economic phenomenon is that companies are more reluctant to create new jobs if entry barriers are stronger. Furthermore, it is shown that the rise in employment depends on the elimination of administrative costs that can hamper entrepreneurship.

While, on the one hand, the literature agrees in considering the deregulation of the product market as beneficial for the employment level, with evident reductive effects on unemployment (Berger & Danninger 2007, G. Fiori, G. Nicoletti, S. Scarpetta, F. Schiantarelli 2007). On the other hand, conflicting opinions tend to result from an analysis focused solely on the effects of EPL on the labour market.

B. Rafi (2015), analyses only the impact of flexibility in the labour market, underlining how the youth labour market participants (i.e. people from 15 to 24 years), have a more significant return in terms of job opportunities thanks to greater flexibility.

R. Di Tella & R. MacCulloch (1999) use a dataset based on surveys made to businessmen in the analysed countries, focusing on the restrictions of hiring and firing from 1984 to 1990 for 21 OECD countries. The results show a positive relationship between deregulation and increased employment. Moreover, appears to be a stronger response in the female labour market than in the male market. Unlike previous results, A.R. Bordon, C. Ebeke, and K. Shirono (2016) analyse the impact of the various reforms on the labour market, considering problems of endogeneity. Using the lagged operator for the employment rate as control variables, the banking crisis, and accounting for country and year fixed effects. They use the local projection approach (LP) with treatment effect techniques, finding that labour market and product reforms have a positive impact on the employment rate, going to increase it by one percentage point every five years. Other economists do not find a significant impact of the deregulation of the product market on employment as in the case of A. Bassanini & R. Duval (2006). In their study, they find that the impact of specific political reform has different effects depending on the institutional context of reference, therefore, each country needs to use reform packages well designed for their particular situation, which produce greater impacts and sometimes even different than the solution of individual policies.

Also, C. Noelke (2011), focuses on the study of the impact of the EPL on youth unemployment, using not only an analysis of conventional regressions but also a difference in difference model. The empirical tests use both OECD aggregated data for a period from 1985 to 2007, and individual data from appropriate surveys for a smaller sample of countries from 1992 to 2007. Both models do not provide concrete evidence that greater flexibility reduces the youth unemployment. Other economists find an even negative impact of greater flexibility. L. Malk (2013) uses the difference in difference as the primary analysis model, taking advantage of the changes in Estonia (subjected in 2007 to labour flexibility reforms), as a pretext to analyse the effect of the deregulation of the EPL, choosing this country as group to analyse and Lithuania as a control group. Assuming that flexibility on the protection of labour is essential for a better adaptation of the workforce to the different economic conditions, it was decided to use the microdata of the worker surveys during the period 2007-2011 to analyse the flows of workers and the effects of the reform. The results of this analysis do not seem to demonstrate the significant influence of deregulation as a cause of higher employment, indeed, in this specific case, the flexibility reform (in addition to not giving the expected results) turned out to be deleterious because of the costs related to the risk of insecurity perceived by workers.

Over the years the literature tried to explain the relationship between the combined deregulation of the two markets and the employment consequences empirically. H. Berger & S. Danninger (2007) find that deregulation of EPL and PMR is beneficial for employment growth, especially when there is an interaction between the reforms of the two markets. Their results are based on a national sample of the Organization for Economic Cooperation and Development from 1990 to 2004. Moreover, from their results, it is highlighted that labour market liberalisation produces a greater employment increase when the product market is competitive, and the same can be said for the opposite case. On the contrary, B. Amable, L. Demmou and D. Gatti (2011), provide new evidence on the relationship between deregulation and employment and inactivity. The authors use a dynamic model by providing evidence of how greater flexibility in the labour market makes the effects of deregulation of the product market weaker, also proving that EPL provides a beneficial effect on the employment level. They conclude that EPL and PMR appear to be substitutes instead of complementary forms of regulation.

**Table 4.1: Empirical findings**

Authors	Dependent variable	Data	Methodology	Endogenous test	Results
<b>Peter R. Fallon, Robert E.B. Lucas (1993)</b>	Employment level	India and Zimbabwe	Regression based on time series. Identification based on pre-post analysis of regulations in different industries	No endogenous test	Regulations reduce in employment in over 80% of industries. In India, no consistent employment effects among smaller formal firms that were not covered by regulation.
<b>Boeri, Nicoletti and Scarpetta (2000)</b>	Non-agricultural employment rate	19 OECD countries over the 1982-1995 Based	Different steps: 1) reduced model for EPL 2)country-specific effect 3)correlation between PMR index and country-specific effect	No endogenous test	Countries with high PMR value have higher non-agricultural unemployment rate
<b>Nicoletti and Scarpetta (2005)</b>	Non-agricultural employment rate	20 OECD countries over the 1980-2002	Fixed effect regression	No endogenous test	Employment can be boost by reducing the PMR. EPL has a negative but not significant impact on employment.
<b>Helge Berger and Stephan Danninger (2007)</b>	Employment growth rate	27 OECD countries over 1980-2004	Panel data technique with fixed effect, IV and GMM	Endogenous test on GMM but not for fixed effect method	Deregulation in EPL and PMR encourage the employment growth
<b>Clemens Noelke (2011)</b>	Youth unemployment	21 OECD countries (1985–2007) and micro data from 15 West-European countries and the U.S. (1992–2007)	Difference in difference estimation using 4 aggregation steps with ols and fixed effects.	No endogenous test	The empirical analysis finds no robust evidence whatsoever linking either dimension of EPL to inferior youth labour market performance
<b>Bilal Rafi (2015)</b>	Unemployment rate	OECD countries over the 2000-2012	Panel data with country-time fixed effect	No endogenous test	The increases in EPL flexibility have a beneficial downward impact on the unemployment rate. Furthermore, there is a complementarity between increases in government effectiveness and EPL.
<b>Rafael Di Tella and Robert MacCullochb (2005)</b>	Employment rate	21 OECD countries over the 1984-1990	Country-time fixed effects, and dynamic panel data techniques	No endogenous test	Countries with more flexible labour markets have higher employment rates and higher rates of participation in the labour force. These results are stronger in the female labour market, although the long-run effects are approximately similar across both male and female sub-groups.
<b>Rachel Griffith, Rupert Harrison and Gareth Macartney (2007)</b>	Unemployment rate	14 OECD countries over 1986-2000	Country-time fixed effect	1) They estimate the impact of PMR and EPL on profitability. 2) they measured the impact of profitability on unemployment rate	A reduction in product market regulation was linked with greater competition. This enhancement in competition is associated with higher aggregate employment.
<b>Céline Piton (2018)</b>	Unemployment rate	24 European countries over the period 1998-2013	Panel data with fixed effect	She uses Instrumental variable approach, using the lagged values of the endogenous variables as instruments	Product market deregulation overall reduces unemployment rate, but labour market deregulation is detrimental to unemployment

## 4.2 Data

To study a possible interaction between EPL along with the PMR on the youth employment rate it is indispensable to start from a database containing a sufficient number of relevant data. In particular, in the analysis developed it has been decided to analyse data from 22 Countries<sup>20</sup>, almost all European, from 1998 to 2013. For practical reasons, to each element of the list of countries is assigned an index, which ranges from 1 to 16. Therefore, a set of panel data is set up with an index unit for Country ( $i = 1 \rightarrow I = 22$ ) and a time index variable for Year ( $t = 1 \rightarrow T = 16$ ). However, many other factors are likely to affect youth employment over regulations.

I do not consider simple bivariate correlations, and I estimate a structural model of employment including some explanatory variables in addition to EPL and product market regulations.

Control variables have been chosen depending on the availability of the data and based on previous research, for the creation of the dataset adopted in the analysis, the source used is the OECD.

Following G. Nicoletti & S. Scarpetta (2003) the control variables chosen, have been those for which data exist for almost all countries over our time-period and that have a high explanatory potential.

The independent variable for this study are:

### Union density<sub>it</sub>

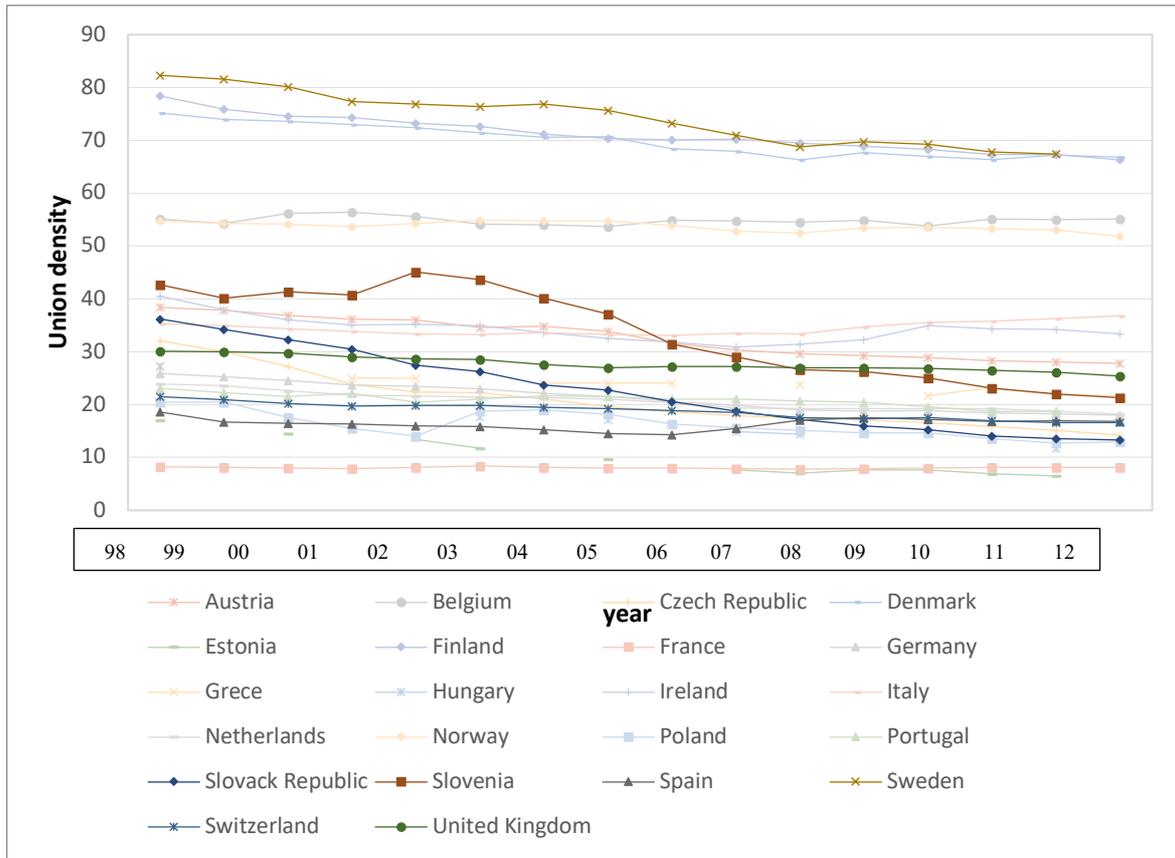
A trade union is an organisation of workers with the purpose of achieving common goals: refining safety standards, and attaining better wages, benefits and working conditions. In the specific case, the union density rate is computed as the ratio of the employees who are members of trade unions to all the employees in a country<sup>21</sup>. This measure plays an essential role in determining the bargaining power held by workers. In the work described by Giovazzi (2003), this measure should approximate what in the model is identified with  $\beta$ . The role played by the union density on employment is controversial, because on the one hand, the trade unions can give "voice" to the needs of workers, through a compact identification in the demand side, improving information flows and increasing their permanence (E. Barth, A. Bryson and H. Dale-Olsen, 2017). On the other hand, an increase in workers' bargaining power negatively affects the probability of hires, which may result in lower employment.

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<sup>20</sup> Italy-Germany-France-Austria-Belgium-Portugal-Spain-Netherland-Ireland-Finland-Greece- Slovak Republic-Slovenia-Iceland-Norway-Sweden-UK-Denmark-Czech Republic-Hungary-Poland-Switzerland.

<sup>21</sup> Density is calculated using OECD data.

**Figure 4.1: Union density trend**



Source: OECD statistic

The Figure 4.1 shows the variation in time of our variable. In recent years, the composition of the union has slowed down in European countries. Between 1998 and 2003, the average score fell by 0.026 compared to 0.046 between 2003 and 2008 and 0.002 between 2008 and 2013.

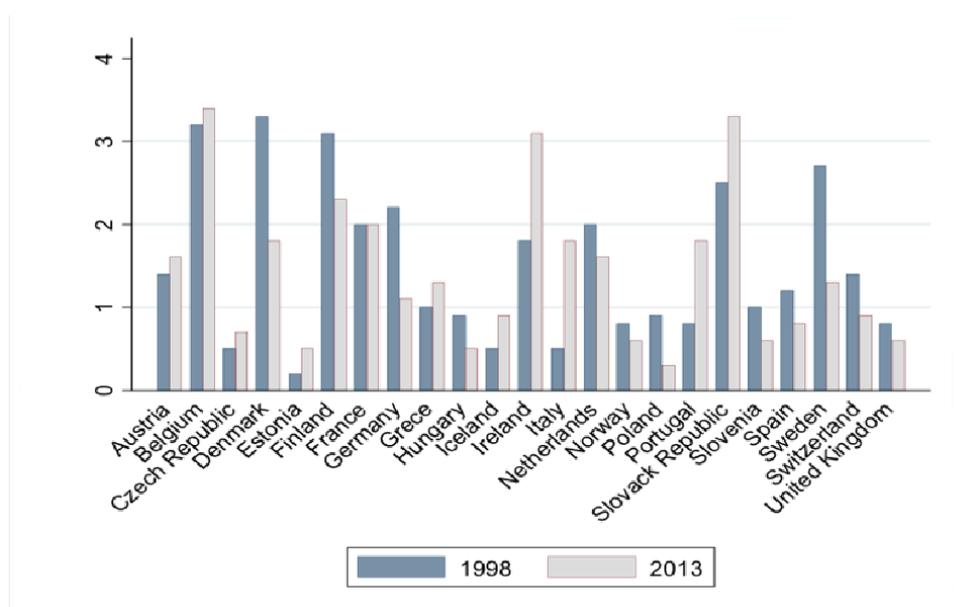
We can divide the sample into two main subgroups using a union density of 50% as a threshold. Countries with high-density union are: Belgium, Denmark, Finland, Norway and Sweden. These countries have maintained a relatively stable trend over the entire period, even if overall, a reduction of around 10% can be seen. Among the nations that are below the 50% threshold, Slovenia and Slovakia stand out, with an overall decrease of 21% and 22% respectively. The leading causes attributable to this drop can be found by a decline in both the extent and intensity of union organising efforts or by a decreased willingness on the part of workers to join unions (W. T. Dickens & J. S. Leonard, 1984).

Replacement rate<sub>it</sub>

It plays an important role because shows the proportion of net income at work that is maintained after the job loss. We refer to a government welfare programme for employable people, who are unemployed. They receive an economic benefit during the research for a new job. The unemployment

benefit replacement rate provides a proxy for the workers' fall-back position included in our model. Generous unemployment benefit systems are also likely to increase the bargaining power of incumbent workers by reducing wage pressures from outsiders (Fiori et al. 2007). The benefits sum should be small; it should allow the unemployed to survive while searching for a new job. The extent of the period that covers the unemployment changes depending on the country and regulation. The more extended the period and the greater the sum is the higher the probability to remain unemployed will be.

**Figure 4.2: Replacement rate variation 1998/2013**

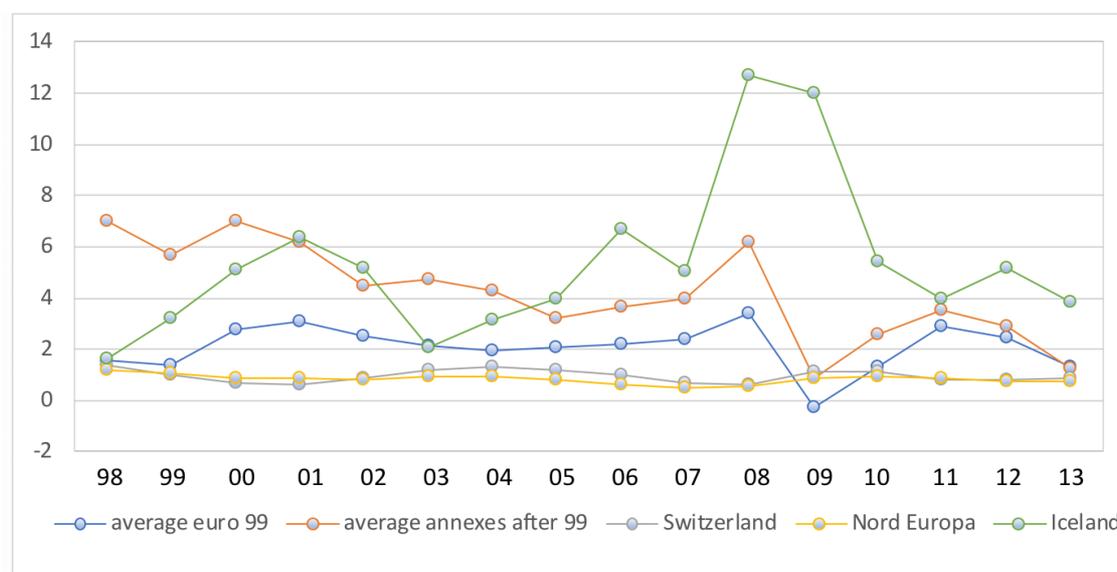


Source: OECD statistic

Inflation<sub>it</sub>:

It is an interesting variable linked to employment through the Philips curve and to the inverse relationship between unemployment and inflation. It is necessary to consider this variable as fundamental in the attempt to explain the variation of the youth employment rate. Analyse its trend, over the last few years, could be a key factor in trying to understand the evolution of the unemployment rate.

**Figure 4.3: Inflation trend in European countries**



(Note: The Nations are grouped by entry into Euro area and geographical position).

Source: OECD statistic

I divided my sample of 20 countries<sup>22</sup> into three different main groups, adding in the analysis Switzerland and Iceland, the latter because it follows a completely different trend compared to other northern European countries. The first group includes the countries that have joined the introduction of the euro at its birth, the data on inflation for this specific group are similar for each country<sup>23</sup>. The second group includes all those countries<sup>24</sup> that have decided to adopt the euro only later. In the end, we have the nations of the north<sup>25</sup> which, despite each have their currency, they seem to share similar trends. The first two groups seem to follow similar patterns since 2005, albeit with different values. This depends on the main constraint introduced with the establishment of the European Central Bank. The primary objective of the BCE is to keep inflation stable; this is done by maintaining the harmonised consumer price index of around 2%. This constraint seems to be reached for the countries that introduced the euro immediately, and after it has also been achieved by those that joined the euro subsequently.

A sharp reduction of inflation's rate can be noted between 2008 and 2009. This trend is due to the impact of the crisis on the European markets. In these years, for the countries that joint the Monetary Union as its birth, the historical minimum is reached. They passed from controlled inflation until

<sup>22</sup> Czech Republic, Hungary and Poland have been drop-out in the formation of groups.

<sup>23</sup> Euro 1999: Italy-Germany-France-Austria-Belgium-Portugal-Spain-Netherland-Ireland-Finland.

<sup>24</sup> Post-adoption euro: Greece- Slovak Republic-Slovenia-Estonia.

<sup>25</sup> Nord Europa: Iceland-Norway-Sweden-UK-Denmark.

2008 to deflation in 2009. On the other hand, it seems that the countries of northern Europe, except for Iceland, have managed to keep their level of inflation stable (between 0% and 1%). This trend seems to be very similar to that followed by Switzerland.

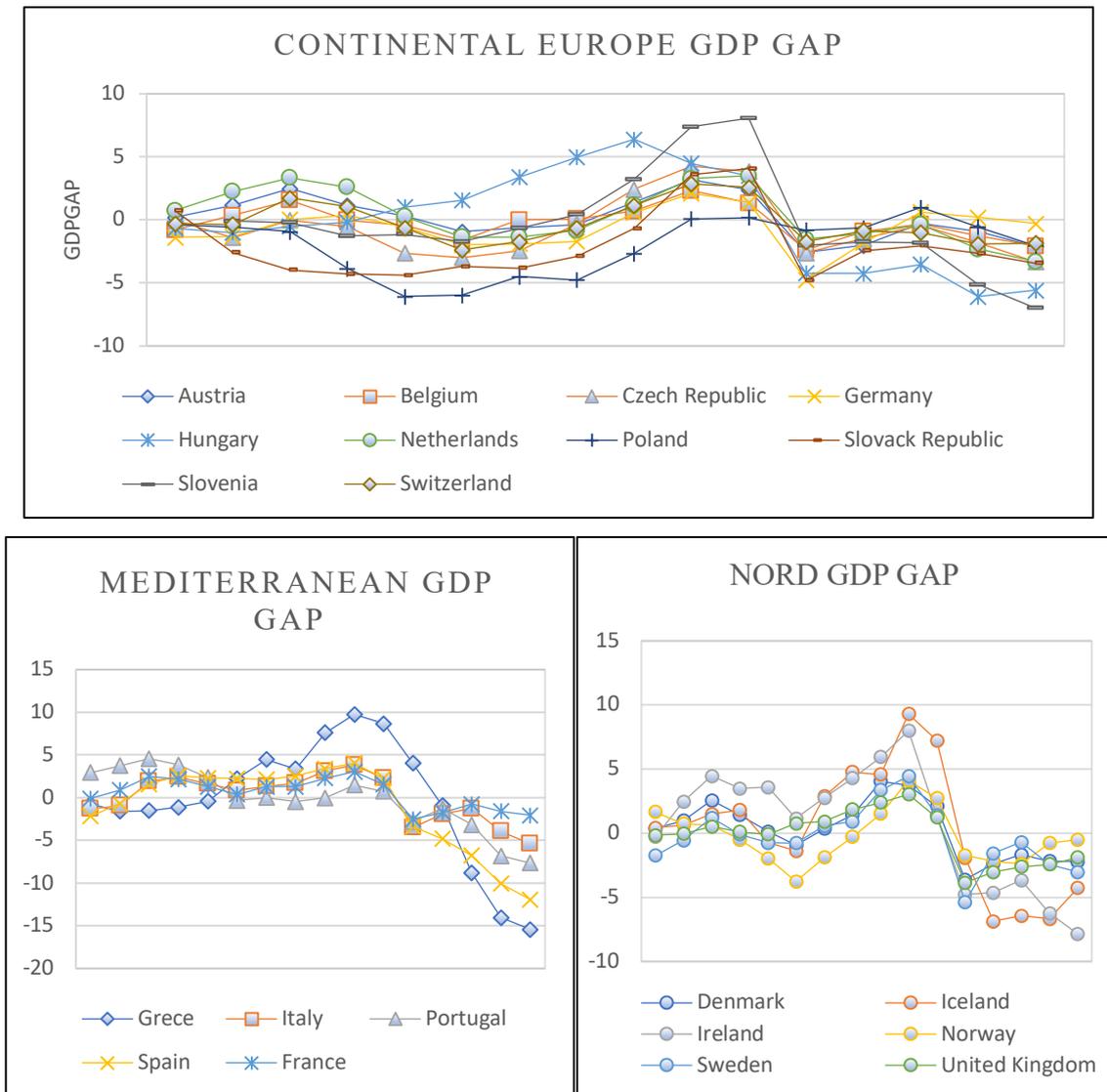
#### GDPgap<sub>it</sub>

it is a very interesting measure because it refers to the disparity between the total current output of an economy and its total potential output. It is included to control for cyclical conditions.

It is expressed, in our case, as a deviation of actual GDP from potential GDP as a percentage of potential GDP. A positive Gap value indicates expansions; conversely, a negative Gap value indicates a period of recession. The former case implies that the economy is overproducing with its current resources because the demand side is growing faster than the supply. This means that employers will need more workforce than the standard and there will be new hires, leading to an excess in the employment's levels. The latter case implies that the economy is underproducing and the employment is under the level of full occupation. In other words, the GDP gap indicates how efficiently a country is using its resources, and both positive and negative values indicate economy inefficiency. An ideal gap value should be close to 0; this would mean that an economy is operating at its full capacity.

Observing the *Figure 4.4* it should be noted that the Mediterranean countries are those characterised by considerable gaps, reaching, in particular with Greece, peaks ranging from +10 to -10 per cent along the entire time frame. On the other hand, the continental countries seem to be the ones with the best performances, managing never to exceed a percentage difference of 5 points. During the years of crisis, all States, without exception, suffered from the start of the recession. This has led to lower production levels and the surpluses between current and potential output have been smoothed to become negative for many countries that were experiencing a phase of expansion before, reaching a new level that will persist permanently until the end of the observation period.

**Figure 4.4: GDP GAP in Europe**



Source: OECD statistic

Labour productivity<sub>it</sub>

“It is measured as GDP per hour worked. It estimates how efficiently labour input is combined with other factors of production and used in the production process. Labour input is defined as total hours worked of all persons engaged in production.” (R. Freeman, 2008). This variable plays a crucial role in identifying the level of employment since higher productivity means higher output with fixed resources and so higher profits for the firm.

Vocational programme<sub>it</sub>

This is a specific control variable for youth employment. As specified by European Commission in the section of human development: “Quality and relevant vocational education and training can provide people, and especially youth, with the knowledge, skills and competencies required for the

*jobs of today or tomorrow. The provision of relevant job skills can, therefore, be a robust means of empowering people to seize employment opportunities or equip them for self-employment. The world's population is younger than ever, with 1.2 billion people aged 16-24. Therefore, providing pathways into the world of work for young people is one of the greatest development challenges of our era".* Through vocational training, I want to control for the effect in the employment rate caused by new integration programme for youth.

### 4.3 Methodology

In this section I am going to focus on the change in the youth employment rate. Labour market reforms probably should have a more direct effect on employment, while the transmission mechanism on employment could be more complicated (Bordon et al. 2016). In the analysis, I examined the impact of the most influential employment determinants, focus on the employment protection legislation and product market regulation.

#### 4.3.1 Baseline Specification

The first set of estimations aims to give an introductory look at the variables of interest, using the OLS method with Time-Series Cross-Section (TSCS) data I want to see the relationship between youth employment rate and its determinants:

$$Ye_{it} = \beta_0 + \beta_1 EPL_{it} + \beta_2 PMR_{it} + \beta_3 X_{it} + \beta_4 Z_{it} + \varepsilon_{it} \quad (1)$$

---

Where  $Ye_{it}$  is the youth employment rate in country  $i$  at time  $t$ , PMR represents the product market regulation index; EPL is the employment protection legislation indicator;  $X$  is the variables' control group for other labour market policies (vocational programme, replacement rate and union density);  $Z$  is a vector of control variables for macroeconomic factors (GDP gap, inflation and labour productivity) and  $\varepsilon_{it}$  is the error term. Testing hypotheses regarding youth employment rates involve specific problems related to the use of Time-Series Cross-Section (TSCS) data. A well-known problem is heterogeneity of panel data. To deal with heterogeneity, I included fixed effects in all the next estimation, using  $\gamma_t$  as set of time fixed effect. Furthermore, some heterogeneity across countries can be omitted or not adequately captured by our explanatory variables. To control for this potential

bias and to account for the specific characteristics of countries, all variables are estimated using the difference with respect to the country mean (country-fixed-effect regression, C. Piton, 2018). Adopting this methodology is possible to control for the business cycle and other unobservable country-specific effects and trends, and general time-specific effects.

$$(Ye_{it} - \bar{Ye}_i) = \beta_0 + \beta_1(EPL_{it} - \bar{EPL}_i) + \beta_2(PMR_{it} - \bar{PMR}_i) + \beta_3(X_{it} - \bar{X}_i) + \beta_4(Z_{it} - \bar{Z}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) + \gamma_t \quad (2)$$

Before proceeding with the estimation of the results, we must address some problems of endogeneity that may arise when we use different explanatory variables in a panel data analysis. Remaining faithful to what literature reports, there could be problems depending on when structural reform is implemented. This could lead to distorted results due to reverse causality. In our specific case, it would be difficult to distinguish the effect on youth employment rate of a reform conducted just before an economic recovery from the impact of the recovery itself. In this case, endogeneity would result in an upward trend in estimates. The opposite is true if the reform is implemented just before a recession. In our time frame, the spread of the subprime mortgage crisis in Europe at the end of 2007, might lead to bias problem. To check that the results do not reflect reverse causality from employment to institutions, I carry out Granger-causality tests<sup>26</sup> for the main institutional variables. It shows not only that there is no evidence of reverse causality effects, but also that there is no evidence that structural reforms are endogenous to the economic environment, this absence of endogeneity could be explained by the fact that the regression estimates the impact of EPL and PMR level in year  $t$  on the level of youth employment rate on the same year (C. Piton, 2018). Structural reforms need time to be validated, for this reason the youth employment rate does not influence the current level of regulation in product and labour markets. In this case, the fixed-effect regression is unbiased by the business cycle and thus constitutes the best estimation that can be made.

Two other potential issue, which can usually be found in similar analysis, might be serial correlation in the residual and multicollinearity. I dealt with the former problem by testing my regression using *Wooldridge test* for serial correlation in panel data<sup>27</sup>. Serial correlation refers to a situation where the

<sup>26</sup> Using Stata command: xtgcause.

<sup>27</sup> Wooldridge test for autocorrelation in panel data. H0: no first order autocorrelation

error term is autocorrelated; this means that the error term of an observation at time  $t$  is influenced by other observation at time  $t-j$ . The results did not find any evidence of serial correlation and baseline coefficients are not biased by it. Multicollinearity, on the other hand, refers to a situation where there is either an exact or approximately linear relationship between the independent variables. Multicollinearity by itself does not bias the fitted coefficients in a regression model but, conversely, it biases the standard errors upwards, of those fitted coefficients. It inflates the size of the confidence intervals in terms of their length. Therefore, it tends to bias student  $t$ -statistic test downwards and creates a problematic situation regarding the evaluation of a regression model. I assess whether there was or not the presence of multicollinearity problem by computing the variance inflation factors. This approach explains to us the extent to which the standard error of coefficients of interest has been inflated upwards. The results are shown in *Table 4.2*.

**Table 4.2**

<i>Variable</i>	<i>VIF</i>	<i>1/VIF</i>
<i>PMR</i>	1.53	0.654462
<i>Productivity</i>	1.42	0.701797
<i>EPL</i>	1.31	0.763248
<i>GDP gap</i>	1.31	0.763420
<i>Union</i>	1.30	0.770484
<i>Replacement rate</i>	1.22	0.818745
<i>Inflation</i>	1.19	0.840498
<i>Vocational program</i>	1.17	0.852260
<i>Mean VIF</i>	1.31	

As we can see from the *Table 4.2*, none of the factors results to have a collinearity problem. Thus, we can conclude that the model is characterised by the absence of multicollinearity issue.

Another problem that we may encounter in time-series cross-section data is the right choice of estimation technique and heteroscedasticity issue. In fact, if there is the presence of heteroscedasticity, the OLS estimator is still unbiased and consistent but they have no longer minimum variance, and it is not efficient anymore. The dataset is characterised by a restricted number of observations, and the standard generalised least square approach of Parks might produce standard errors extremely overconfident. “*The Parks estimator may understate variability by between 50% and 300% in a practical research situation*” (Beck & Katz, 1995). Therefore, they propose to retain OLS parameter estimates but replace the OLS standard errors with a panel-corrected standard error. Applying this new approach, we may be able to account for panel heteroscedasticity.

#### 4.3.2 Specification for sub-categories of EPL & PMR, and the interaction term

In the second part of the analysis, I will focus on the role of specific categories of employment protection legislation and product market regulation and their impact on youth employment rate. To do this, I am going to use the indicators reported in the OECD and specified in the second chapter of this dissertation. The work strategy will be defined as follows: in the first set of regression, I will concentrate only on the impact of collective dismissal, individual dismissal and temporary contract, leaving unchanged the PMR variable. In the second set of regression conversely, I will take into account only product market regulation composition: state control, barrier to entrepreneurship and barrier to trade and investment.

$$\begin{aligned}
 Ye_{it} = & \beta_0 + \beta_1 Coldis_{it} + \beta_2 Indism_{it} + \beta_3 Tempcontr_{it} + \beta_4 PMR_{it} \\
 & + \beta_5 X_{it} + \beta_6 Z_{it} + \varepsilon_{it}
 \end{aligned} \tag{3}$$


---

$$\begin{aligned}
 Ye_{it} = & \beta_0 + \beta_1 EPL_{it} + \beta_2 Barentr_{it} + \beta_3 Bartrad_{it} + \beta_4 Statcontr_{it} \\
 & + \beta_5 X_{it} + \beta_6 Z_{it} + \varepsilon_{it}
 \end{aligned} \tag{4}$$


---

Then I will try to go further in the analysis using the interaction between PMR and EPL. In fact, as suggested by Blanchard & Giavazzi, 2003; product market regulation and employment protection

legislation may have a joint effect that might be higher or lower than their indicators taken individually. The short-term impact on youth employment of structural reform in a given sector may depend on existing policies and institutional regulations in other areas. Going to investigate the economic effects due to product market reforms, they appear to be more substantial if the labour market is "flexible". In particular, when entry barriers are reduced, new jobs are filled more quickly, and laid-off workers find new jobs more quickly in a "flexible" labour market. However, long-term gains from product market reform are less if labour markets are flexible (Cacciatore, M., R. Duval and G. Fiori (2012)). This implies that there is long-term substitutability between labour and product market reforms. Thus, could be interesting to analyse the impact of this new index, obtained as a pure product between EPL and PMR. I control for the same independent variable, and I consider the interaction term as a dummy variable that will take the value of:  $1$  if the product between both regulations is above its average and  $0$  otherwise. A problem with this approach may be that I consider the influence of both regulations as equally distributed, weighing their impact on youth employment as distributed to 50% between the two.

$$Ye_{it} = \beta_0 + \beta_1 EPL_{it} + \beta_2 PMR_{it} + \beta_3 EPL * PMR_{it} + \beta_4 X_{it} + \beta_5 Z_{it} + \varepsilon_{it} \quad (5)$$


---

## 4.4 Results

### 4.4.1 Baseline regressions

*Table 4.3* shows the main regressions used to estimate the impact of the EPL and PMR on youth employment. In the first column are inserted results obtained using a simple OLS approach. From the results, we can see how both employment protection legislation and product market regulation have a negative impact on youth employment. However, these estimates are distorted due to the related econometric problems mentioned above. In fact, moving our attention to the second column we can see how, using the panel corrected standard error, the standard error reported for each variable in parentheses seems to be decreased although the absolute value of the coefficients is similar in the two regressions. Now, the results should be more accurate. Despite this first attempt, issue of heterogeneity of cross-sectional units is still persistent. To address these problems, the time-fixed effect and country-fixed effect were gradually added (column 3 and 4). Now our estimate is decidedly

more precise, and it is possible to give a more accurate interpretation of the results. As can be seen from column 4 of *Table 4.3*, a higher restriction in labour market regulation significantly reduces employment among young people. More precisely, the dependent variable results to be negatively affected by the coefficient of EPL for a value that influence more than proportionally its effect. The result impact is even more pronounced, considering product market regulation. The coefficient has a more significant impact on our dependent variable respect the case of EPL, even here the estimation of its coefficient is negative, which implies the inverse relationship between youth employment and PMR.

**Table 4.3: Impact of EPL and PMR on the youth employment rate**

	(1)	(2)	(3)	(4)
<i>Employment Protection</i>	-3.86*** (1.19)	-3.81*** (0.51)	-5.56*** (0.41)	-1.14** (0.51)
<i>Product Market Regulation</i>	-5.94*** (2.13)	-6.57** (1.69)	-8.45*** (1.77)	-2.50*** (0.47)
<i>Estimator</i>	OLS	OLS	OLS	FE
<i>Panel-corrected S.E.</i>	No	Yes	Yes	Yes
<i>Control Variables</i>	Yes	Yes	Yes	Yes
<i>Country Fixed effects</i>	No	No	No	Yes
<i>Year Fixed effects</i>	No	No	Yes	Yes
<i>R<sup>2</sup></i>	0.48	0.49	0.46	0.89
<i>Number of observations</i>	305	305	305	305

*Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.*

#### 4.4.2 Robustness check

To ensure the validity of these results, I proceeded to carry out checks of robustness with reference to the method chosen to analyse the effects of youth employment. To verify that this method is the most suitable to continue the analysis, I tried to investigate the robustness of the results to alternative estimation methods. As suggested by the literature (Fiori et al 2007), I used random effects estimators to capture the homogeneous institutions over time, for the sole purpose of testing its validity in comparison with the previously described fixed effect method through the *Hausman test*. It rejects the consistency of estimates, suggesting that more reliable estimates are obtained using fixed effects. This is not surprising since institutional variables are probably not related to country effects, since they include other unverified invariant institutions over time; a condition required for the consistency

of the random effect estimator (A. Bassanini & R. Duval, 2009). Thus, once we ascertained the validity of the method of analysis, we went to check that these results were not distorted due to the isolated behaviour of some countries that were subject to stronger deregulation in the last period.

**Table 4.4: Robustness checks of EPL and PMR impact on the employment rate**

	<i>Baseline regression</i>	<i>Excluding PT, GR, ES, IT</i>
<i>Employment Protection</i>	-1.14*** (0.51)	1.34** (1.09)
<i>Product Regulation</i>	-2.50** (0.47)	-1.90** (0.98)
<i>Estimator</i>	FE	FE
<i>Country Fixed effects</i>	Yes	Yes
<i>Year Fixed effects</i>	Yes	Yes
<i>R<sup>2</sup></i>	0.62	0.58
<i>Nb. of observations</i>	271	228

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

We can notice that, while for what concern PMR, the result is very similar in impact and significance to that of the previous analysis (even if the impact now is slightly higher), the effect of employment protection legislation is reversed, loosening degree in the value of significance. Therefore, excluding from the analysis those countries that have been strongly deregulated in the last period, or in which the deregulation in the labour market has been heavier than the others, the coefficient changes its sign. This can go to support the idea that deregulation will have a bivalent impact depending on the temporal analysis. In the short-term, higher regulation can have positive effects. Another possible explanation is that deregulation of EPL could be detrimental, it may hinder access to permanent and stable employment, such reforms are not always accompanied by a significant improvement in overall employment rates. In other words, the marginal reforms of the EPL, which are responsible for the distinct levels of protection between temporary and permanent workers, are likely to be a failure in the objective of integrating job seekers into the labour market while, at the same time, they exercised only limited influence to combat unemployment (P. Barbieri & G. Cutuli 2015).

### 4.4.3 The crisis' effects

The financial and economic crisis that began in 2008 in the American sub-prime mortgage market which consequently hit the real economy spread all over the world, but the impact was somewhat heterogeneous among the various countries. Nations responded differently to the crisis and with varying degrees of success. Some factors moderated its impact on individual countries labour market (W. Eichhorst et al. 2010). Among these variables there are various reforms in the regulation of the goods and labour market. So, I thought it would be interesting to examine the effect of regulation in the years before and after the economic crisis. In *Table 4.5*, you can visually see these differences. The sample was branched into two reference periods, but the countries being analysed remain unchanged. The first column presents an analysis for the period from 1998 to 2007, in the second column while the reference period includes the years from 2008 to 2013.

**Table 4.5: EPL and PMR performance before and during the crisis**

	<i>Pre-crisis regression</i>	<i>During-crisis regression</i>
<i>Employment Protection</i>	-1.60** (0.91)	3.65** (1.66)
<i>Product Regulation</i>	-1.75* (1.05)	-1.20* (1.18)
<i>Estimator</i>	FE	FE
<i>Country Fixed effects</i>	Yes	Yes
<i>Year Fixed effects</i>	Yes	Yes
<i>Adjusted R<sup>2</sup></i>	0.82	0.78
<i>Nb. of observations</i>	206	149

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

As we can see, there are several inconsistencies in the comparison of the two samples. Starting from the analysis of the PMR, although there are very similar results considering both the coefficient and the standard error, in the second column this variable becomes slightly lower but maintain its significance. The real difference lies, however, in the analysis of the EPL. In fact, considering only the pre-crisis period, the results tend to be congruent with those of the papers that takes into account the entire time frame, i.e. a less harsh regulation in the labour market is beneficial to increase the

youth employment level. However, during the crisis, the sign of this coefficient would appear to be reversed. Now, a narrower regulation corresponds to an increase in employment. This increase should be seen not only in the recruitment of new personnel but also as a relative reduction in redundancies. In other words, during the years of the crisis, a greater narrowness in the possibility of firing, due to more extensive economic consequences for employers, corresponded to a more tenuous variation in the employment rate. In recent years, there has been convergence from the various European countries into labour market policies, but despite the evidence of convergence, transnational differences remain in the strength of occupational protection, labour market policies and support for the unemployed. These transnational variations are essential to explain the differences in the impact of the current economic crisis (J. Heyes, 2011). In fact, as reported by a publication of the European Commission, between 2008 and 2009, the impact on real GDP of Denmark, Sweden, Italy and Germany was very similar, nevertheless, they recorded different reductions in their employment rates (respectively - 2.4%, -2.1%, -1.2% and + 0.2%). Countries that have proven to have a high labour protection index have managed to suffer less severe reductions in their employment rate compared to those with weaker employment protection. Naturally, this effect is a consequence of an analysis that is concentrated in the short term. In fact, these mechanisms over the last few years have shown their inability to deal with crises of magnitude as large as the one begun in 2008. In the long-run, the possibility of firing freely represents a buffer capable of mitigating the negative impacts accused by companies, reducing the possibility of bankruptcy.

#### 4.4.4 Regression using employment protection sub-categories indices

Using data built up by OECD, we can divide the EPL by different types of contract, always using OECD dataset (regular or temporary). For regular contracts, employment protection legislation takes into account individual or collective dismissal costs. I have estimated the different equations using the same methods used for the aggregate value. Starting from an OLS model with panel corrected standard error to end using fixed effect.

Reminded previous results, the aggregate EPL index have negative coefficients. Here, individual dismissal follows the same pattern, reflecting the same trend. We can see from *Table 4.6*, as individual dismissal and temporary contract have similar coefficient. Considering individual dismissal, an increase of one unit in the variable negatively affect the youth employment. Thus, deregulating this form of protection means higher the youth employment rate, as well as, an increase in the protection of temporary contract reduces the employment. This is confirmed by the literature. In fact, it is well known that it is difficult to find a definitive and stable occupation as a first job.

The occupations of those who appear for the first time in the labour market, predominantly young, are characterised by the short duration of the contract. Therefore, deregulation this type of contract, will directly influence the youth employment rate. Deregulation for collective redundancies appears to reduce the level of employment.

**Table 4.6: Sub-indices of employment protection legislation on the youth employment rate**

	(1)	(2)	(3)
<i>Employment Protection</i>			
1) individual dismissals	-3.78*** (0.71)	-3.14*** (0.50)	-1.27** (0.68)
2) collective dismissals	1.26* (0.68)	0.81 (0.71)	0.67*** (0.46)
3) temporary employment	-5.23*** (0.47)	-4.97*** (0.38)	-1.32** (0.55)
<i>Product Market Regulation</i>	-3.83** (1.32)	-8.97*** (1.43)	-2.95*** (0.57)
<i>Panel-corrected S.E.</i>	Yes	Yes	Yes
<i>Estimator</i>	OLS	OLS	FE
<i>Control Variables</i>	Yes	Yes	Yes
<i>Country Fixed effects</i>	No	No	Yes
<i>Year Fixed effects</i>	No	Yes	Yes
<i>R<sup>2</sup></i>	0.44	0.41	0.67
<i>Number of observations</i>	298	298	298

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

#### 4.4.5 Regression using Product market sub-categories indices

As for the case of EPL, the negative and statistically significant coefficient of product market regulation can hide different and sometimes opposite effects. To discover the different inside effect of PMR, I run a regression considering the three types of PMR. Public ownership and involvement in business operations by the Government are detrimental to the youth employment rate. An increase in State control impact with a more than proportional effect on the independent variable of youth employment rate. On this topic there are conflicting opinions from the literature, some paper finds that state controls increase the level of employment (Fiori et al. 2007, C. Piton, 2018). Other authors find no significance in their results (Boeri et al.2000).

For what concern the other two variables, we can see that, as for the State control, both have a negative coefficient, this means that a strict regulation in the barrier to trade and investment along with regulation in the barrier to entrepreneurship are significant and have a negative impact on the level of youth occupation. An increase in barrier to entrepreneurship is associated with a significant reduction in the youth employment rate. The Same pattern is followed by the barrier to trade and investment even if with a coefficient slightly lower.

**Table 4.7: Sub-indices of product market regulation  
on the youth employment rate**

	(1)	(2)	(3)
<i>Product market regulation</i>			
1) <i>State Control</i>	-4.20*** (1.39)	-6.38*** (1.21)	-2.59* (0.33)
2) <i>Barrier to entrepreneurship</i>	-2.03 (1.40)	-6.31*** (1.32)	-4.92*** (0.70)
3) <i>Barrier to trade- investment</i>	-3.82* (2.33)	-4.78*** (1.77)	-1.13 (0.42)
<i>Employment protection     legislation</i>	-9.86** (1.02)	-8.54*** (0.89)	-1.22 (0.99)
<i>Panel-corrected S.E.</i>	Yes	Yes	Yes
<i>Estimator</i>	OLS	OLS	FE
<i>Control Variables</i>	Yes	Yes	Yes
<i>Country Fixed effects</i>	No	No	Yes
<i>Year Fixed effects</i>	No	Yes	Yes
<i>R<sup>2</sup></i>	0.41	0.52	0.87
<i>Number of observations</i>	293	293	293

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

#### 4.4.6 Regression on the impact of EPL and PMR interaction

As suggested in the economic model of Blancher & Giavazzi 2003, the goods and labour market interact with each other. This interaction influences the employment level both in the short and long term. So far, we have seen the impact of deregulation on the goods and the labour market as distinct variables that do not interact with each other and therefore have independent effects on the employment level. Now inserting a term of interaction between EPL and PMR, I want to examine the combined impact of different reforms and when their effect is attenuated or enhanced by such interaction. As can be seen from *Table 4.8*, high employment protection legislation and a strict product market regulation have an influence on the amplified youth employment level. In fact, if the coefficients and therefore their individual impact, the EPL and PMR are respectively -1.61 and -2.52; the coefficient that translates the impact of the interaction between the different types of regulation is even higher of EPL taken individually, -1.80. It is no coincidence that countries that have experienced strict legislative and regulatory conditions on both fronts (such as Spain, Italy, Greece and Portugal) are those characterised by a higher rate of youth unemployment.

**Table 4.8: Interaction between EPL and PMR and its impact on youth employment rate**

	(1)	(2)	(3)
<i>Employment Protection</i>	-4.33*** (0.50)	-4.43*** (0.55)	-1.61*** (0.51)
<i>Product Regulation</i>	-8.80*** (1.94)	-10.42*** (1.09)	-2.52*** (0.82)
<i>EPL*PMR</i>	-6.52*** (2.97)	-8.55*** (3.12)	-1.80*** (0.52)
<i>Estimator</i>	OLS	OLS	FE
<i>Country Fixed effects</i>	No	No	Yes
<i>Year Fixed effects</i>	No	Yes	Yes
<i>R<sup>2</sup></i>	0.51	0.54	0.87
<i>Nb. of observations</i>	307	307	307

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

#### 4.4.7 Employment by types of worker: considering sex and educational level

I will analyse and compare the results between youth employment (*Table 4.3*) and adult employment. As a reference sample for the latter group, I used OSCE data and Eurostat data as a source, taking into consideration the age group between 25 and 64 years.

Young people are the category most affected by low-level of employment, particularly by long-term unemployment. In 2016, 5.5% of the active population of young people in Europe between the ages of 15 and 24 had long been unemployed. The experimentation of long-term unemployment in a young person can significantly affect not only the prospects of earning, with the risk of being employed in semi-skilled or even unqualified occupations but also on the size of the young's well-being. Reducing overall satisfaction with life and increasing the risk of social exclusion (Eurofound, 2017). Therefore, a significant impact had as a consequence of a deregulation in the labour and products market with regard to the increase in youth employment, could be an asset not only in the short term through direct employment of young people in the labour market. However, it could also result in an investment in the future workforce and social integration of these people. Analysing the first column of *Table 4.9*, we note that both EPL and PMR have a negative coefficient and therefore negatively affect the general employment level. However, if for the EPL, the impact of the latter is likely to be similar in the two different samples (compare the results with column 4 of *Table 4.3*) a substantial difference is viewed regarding the PMR.

If for the general employment its coefficient is -1.42, with reference to the employment of youth there is a result that corresponds to almost double. Therefore, deregulation in the product market is beneficial for employment levels in general, but the major impact resulting from these policies translates into a considerable increase in youth employment.

Considering now, the differences in adult employment and analysing them by gender, the results show a larger effect of structural reforms on women. Looking at the coefficient of those variables we can see a net difference in favour of the female sample. Regarding PMR, we can notice a similar impact on the gender, women seem to be more affected by the increase in the PMR index than men. I will analyse separately, the effects of EPL and PMR considering employment by gender and by the level of education, using FE regression.

To construct this sample, I used people aged between 15 and 39. Three categories are considered for the level of education: The low educational level that corresponds to pre-primary education until lower secondary school (levels 0-2 of the ISCED). Middle education, that takes into account a sample from upper secondary education to post-secondary non-tertiary education (levels 3-4). In the end, the

high education level, that corresponds to first and second stages of tertiary education, including programmes designed to provide advanced academic knowledge, among which master's degree, and programme designed to lead to an advanced research qualification, such as doctoral programme (levels 5-8). These categories are based on the International Standard Classification of Education (ISCED)<sup>28</sup>.

The first two levels of education are similarly impacted by reforms in product market regulation for both genders. Whereas, considering the EPL indicator, it loses its significance for a lower level of instruction when we consider males' employment, the same happens for females' average level of education. However, how we can see for the total employment, the coefficient is still significant. A reverse effect we can notice with reference to the last category. It seems that higher regulation in both EPL and PMR is beneficial for males as well as for females. This response is confirmed by the results of total employment in *Table 4.9*. The reason behind may be that when the PMR is very strict only the most competitive workers on the labour force are able to find a job; this category is represented by the people with the highest level of instruction.

The difference in the impact of the reforms related to the gender still remain for each section considered; men seem to receive a greater benefit from deregulation in comparison to the female counterpart. Even considering the impact of ISCED 5-8, when the effect for the EPL and PMR becomes positive, the female counterpart receives less benefit compared with men.

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<sup>28</sup> ISCED is the reference international classification for organising education programmes and related qualifications by levels and fields.

**Table 4.9: Impact of EPL and PMR on employment rate for different type of workers**

	Adult employment			Youth employment by education								
	Total	Gender		Total	Males			Females				
	General	Female	Male	Isced 0-2	Isced 3-4	Isced 5-8	Isced 0-2	Isced 3-4	Isced 5-8	Isced 0-2	Isced 3-4	Isced 5-8
<i>Employment Protection</i>	-1.15*** (0.34)	-2.37*** (0.61)	-0.72*** (0.32)	-0.85* (0.74)	-0.57* (0.41)	0.75** (0.99)	0.73 (0.81)	-0.73* (0.70)	1.34*** (0.33)	-1.49** (0.75)	-0.46 (0.47)	0.62** (0.53)
<i>Product Market Regulation</i>	-1.42*** (0.31)	-2.39*** (0.59)	-0.42*** (0.19)	-2.48** (1.14)	-3.48*** (0.66)	1.86*** (0.38)	-2.20*** (1.17)	-3.47*** (0.95)	2.75*** (0.25)	-2.75*** (1.12)	-3.30*** (0.54)	1.12*** (0.44)
<i>Estimator</i>	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
<i>Control Variables</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R<sup>2</sup></i>	0.84	0.83	0.80	0.86	0.81	0.78	0.86	0.82	0.79	0.82	0.85	0.79
<i>Number of observations</i>	295	295	295	304	304	304	304	304	304	304	304	304

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

## Conclusions

This dissertation aimed to examine the leading causes of youth employment in the last twenty years, starting from European policies and then focusing on the impact that the deregulation of the product and labour market may have on employment levels. The theoretical analysis of the Blanchard & Giavazzi (2003) model, already suggested us how the market of goods and the labour market could be connected and how deregulation of both markets could be beneficial for employment levels. Moreover, in the model itself, we tend to differentiate the results into two levels of temporal analysis: short and long term. This distinction is essential for a more accurate empirical study. In fact, as confirmed by M. Cacciatore, R. Duval and G. Fiori (2012), the reforms need time to reveal their net effects on the market.

For the empirical analysis, I used 22 OECD countries between 1998 and 2013. My primary concern was the possibility that the economic crisis could distort my results due to endogeneity problems. As consequence, deregulation could have been endogenous to the economic environment. However, using appropriate tests, this problem was immediately excluded.

The first approach at the analysis has been carried out by taking into account both country and time fixed effect and trying to solve variable endogeneity problems. The results are clear: deregulation of the product market has a positive impact on youth employment, as well as the deregulation of the labour market. However, we must consider that, in the last period of the sample, significant liberalisation reforms have been implemented in several European countries. As confirmed by the results of Cacciatore et al. (2016), the deregulation of the labour market could have adverse effects on employment in the short-term. These results are confirmed in the employment analysis of the crisis period, the coefficient of the EPL is positively correlated with higher employment levels. The reason behind could be an impact of the reform on the short-term employment level. This increase should be considered not only as the recruitment of new personnel but also as a relative reduction in redundancies. Both the effect of deregulation of the product market and the labour market can be decomposed into the respective sub-indices. For the product market, we have state control, barriers to entrepreneurship and barriers to trade. As the results suggest, a reduction in all the three variables (barriers to entrepreneurship, trade and state control) would have a beneficial effect on employment, even if not always in the literature a reduction in government intervention tends to reduce unemployment rates. Moving on the analysis of the EPL in its sub-indices we find that deregulation of legislation on temporary contracts as well as in individual dismissals gives benefits to youth employment.

This document seeks to provide further analysis, distinguishing workers by sex and education and trying to compare the youth and adult samples. The results show that the effects of the reforms have greater consequences if we consider the female cluster or if we examine the youth employment compared to the adult. Furthermore, it is highlighted how the effect of higher flexibility and reduced narrowness in the product market impacts differently on the samples subdivided according to the corresponding level of education. If the effects of deregulation appear to have a positive impact on employment regarding the less educated sample as well as the one concerning a medium education, the opposite occurs taking into account the sample of the most educated. Further research on the subject can be done. First of all, we could investigate more in depth the causes of employment related to the level of education. Furthermore, for a more detailed analysis, we could consider the inactivity rate among young people and see how it affects employment levels.

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# Appendix

## Appendix 1

### Germany reform

Germany, after the EMS currency crisis of the early 1990s, had ceased to play the role of a traditional locomotive of the European economy. The unemployed had grown continuously in the nineties, slowing their enthusiasm rapidly following the fall of the Berlin Wall. In 2002 the jobless had returned above the four million marks, and at the turn of the new century there had been the longest phase of stagnation after World War II. A fundamental shock was given by the German Reform of the labour market implemented between the years 2003/2005, under the government of Chancellor Gerhard Schröder, who took the name of Hartz reform. The reform was implemented progressively through four laws: the first came into force on 1 January 2003, the second on 1 April 2003, the third on 1 January 2004 and the last, the most important, on 1 January 2005. The Hartz reform gave strengthened by German state welfare thanks to state grants which benefited millions of unemployed, who proved to be in active job search. The German unemployed were solicited with work proposals, which could not be refused under penalty of penalties (10%, 20%, 30% or 60% less than the contribution depending on the case) and suspension of the same subsidies for three months in cases where the proposal had been habitually refused.

Reform phases:

#### *HARTZ 1*

The first reform has as its main objective the elimination and rescheduling of unemployment benefits (which could cover up to 32 months after the dismissal); moreover, it sees the introduction of job centers, where "advisers" are assigned, who follow the process of integration into the labor market.

#### *HARTZ 2*

This second part of the reform provides for the introduction of Minijob contracts, precarious and less taxed employment contracts and Midijob, atypical contracts that provide for a maximum remuneration of € 400 (not subject to contribution). It also provides for the financing of new forms of self-employment for the unemployed (micro-enterprises) and greater support for those over 50.

#### *HARTZ 3*

The third reform saw the transformation of the Federal Labor Office into the Federal Employment Agency; stimulating most of the unemployed to found small businesses through subsidies and tax benefits.

#### *HARTZ 4*

The fourth act is the last but the most important; provides for inclusion measures and a single economic assistance system to reduce long-term unemployment. The duration of unemployment support went from two years to one and a minor subsidy was introduced linked to the effective availability and commitment of the worker to actively seek new employment. Through this last point of the reform a minimum income of citizenship was introduced, distributed to any citizen, even to those who had never worked even one day. This income amounts to about € 400 plus accommodation if needed.

This series of reforms was not painless for Germany. In those years a wave of protests, especially from the trade union world, hit the German squares and Schröder himself collapsed in political polls. The idea behind the Schröder model was to make work for businesses less costly, unemployment benefits less affordable, layoffs easier and more flexible contracts. In this way the companies are back to being more competitive and are back to hire more people, until then unemployed.

## **Appendix 2**

### Enlargement of the European Union

Below is a brief chronology of the countries that have become protagonists of these enlargements:

- July 23th, 1952: European Coal and Steel Community founded by Belgium, France, Federal Republic of Germany, Italy, Luxembourg and the Netherlands.
- January 1<sup>st</sup>, 1958 European Economic Community: Belgium, France, Federal Republic of Germany, Italy, Luxembourg and the Netherlands.
- January 1<sup>st</sup>, 1973: By resolution of May 24<sup>th</sup> 1972 the Council of the European Communities approved the accession of the United Kingdom, Denmark and Ireland which signed the Accession Treaty on January 22<sup>th</sup> 1972 in Brussels.
- January 1<sup>st</sup>, 1981: By resolution of May 24<sup>th</sup> 1979 the Council of the European Communities approved the accession of Greece which signed the Accession Treaty on May 28<sup>th</sup> 1979 in Athens.
- February 1<sup>st</sup>, 1985: Greenland withdrew following the outcome of a 1982 referendum.
- January 1<sup>st</sup>, 1986: By resolution of May 24<sup>th</sup> 1985, the Council of the European Communities approved the accession of Portugal and Spain which signed the Accession Treaty on June 12<sup>th</sup> 1979 respectively in Lisbon and Madrid.
- October 3<sup>rd</sup>, 1990: German reunification; the annexation of the German Democratic Republic in the unified Federal West Germany is an enlargement of the European Communities without increasing the number of member states.

- January 1<sup>st</sup>, 1995: By resolution of May 16<sup>th</sup> 1994 the Council of the European Union approves the accession of Austria, Sweden and Finland which sign the Accession Treaty on June 24<sup>th</sup> 1994 in Corfu.
- May 1<sup>st</sup>, 2004: By resolution of December 13<sup>th</sup> 2002, the Council of the European Union approves the accession of Cyprus, Malta, Hungary, Poland, Slovakia, Latvia, Estonia, Lithuania, the Czech Republic and Slovenia who sign the Accession Treaty on April 16<sup>th</sup> 2003 in Athens.
- January 1<sup>st</sup>, 2007: By resolution of December 16<sup>th</sup> 2004, the Council of the European Union approves the accession of Romania and Bulgaria who sign the Accession Treaty on April 25<sup>th</sup> 2005 in Luxembourg.
- July 1<sup>st</sup>, 2013: By resolution of December 1<sup>st</sup> 2011, the European Parliament approves the accession of Croatia which signed the accession treaty on December 9<sup>th</sup> 2011 in Brussels.

### Appendix 3

Source: Wooldridge Jeffrey M. – 2006, “Introductory econometrics: a modern approach”.

Wooldridge Jeffrey M. – 2010, “Econometric Analysis of Cross Section and Panel Data”.

#### Pooled ordinary least squares (pooled OLS)

The simplest model of estimation for panel data is the pooled OLS model, which exploits the estimator of ordinary least squares. In most cases it is unlikely to be adequate for the analysis but offers a guideline for comparison with more complex models. The definition of the pooled OLS model can be written as:

$$y_{it} = x_{it}\beta + u_{it} \quad (A.3.1)$$

where  $y_{it}$  is the observation of the dependent variable for the cross-sectional unit  $i$  at the period  $t$ ,  $x_{it}$  is a  $1 \times k$  vector of independent variables observed for unit  $i$  at period  $t$ ,  $\beta$  is a vector  $k \times 1$  of parameters, and  $u_{it}$  is an error or disturbance term specific to unit  $i$  at period  $t$ . The use of the pooled OLS model has a significant disadvantage, in order to use the model and obtain consistent estimates of  $\beta$ , it is necessary to assume that the unobserved effect  $\alpha_i$  is uncorrelated with  $x_{it}$ ,  $E(x_{it} \alpha_i) = 0$ .

If the pooled OLS model is estimated, it is inconsistent and distorted if the aforementioned correlation exists. The distortion due to this problem is also called heterogeneity bias, but it is simply a distortion due to the fact that no time-constant variable has been included. (Wooldridge, 2006). The estimate through pooled OLS requires the validity of five assumptions:

- Ass. OLS1: linearity. The dependent variable is formulated as a linear function of independent variables and of the disturbance term;

- Ass. OLS2: exogeneity. The expected disturbance value is zero or errors are not correlated with any regressor;
- Ass. OLS3: homoscedasticity and not autocorrelation. The disturbances have the same variance and are not related to each other;
- Ass. OLS4: the observations of the independent variables are not stochastic but fixed in repeated samples without measurement errors;
- Ass. OLS5: full rank. There is no multicollinearity, i.e. there is no perfect linear relation between the independent variables.

### The fixed effects model

It is possible to break down the term  $u_{it}$  (indicating all unobservable variables), in its two components,  $\varepsilon_{it}$  and  $\alpha_i$ .

$$u_{it} = \alpha_i + \varepsilon_{it} \quad (A.3.2)$$

providing the model:

$$y_{it} = x_{it}\beta + \alpha_i + \varepsilon_{it} \quad (A.3.3)$$

$u_{it}$  is then decomposed into the two parts  $\alpha_i$ , the part of the error depending on the unit observed and independent with respect to time, comprising the effect of all unobservable variables, and  $\varepsilon_{it}$ , the part of the peculiar error of the observation.

The fixed effects model focuses on eliminating the  $\alpha_i$  intercept, constant over time, as it contains unobservable values and therefore would be considered an integral part of the model error. These values could be correlated with the  $x_{it}$  explicative variables, returning a distorted estimate. The elimination of the term  $\alpha_i$  is based on the data-demeaning procedure. It consists of subtracting the group mean from each of the variables and estimating the model without intercepting through the pooled OLS estimator. (Wooldridge, 2006)

The dependent variable can be written as

$$\bar{y}_{it} = y_{it} - \bar{y}_i \quad (A.3.4)$$

And the group mean  $\bar{y}_i$  is defined as

$$\bar{y}_i = \frac{1}{T_i} \sum_{t=1}^{T_i} y_{it} \quad (A.3.5)$$

where  $T_i$  is the number of observations for unit  $i$ . A similar formulation also applies to independent variables.

Consider a simplified model, for clarity, of a model with only one explanatory variable.

$$y_{it} = \beta_1 x_{it} + \alpha_i + \varepsilon_{it} \quad (A.3.6)$$

rewriting the equation using the variables averages over time.

$$\bar{y}_i = \beta_1 \bar{x}_i + \alpha_i + \bar{\varepsilon} \quad (A.3.7)$$

Since  $\alpha_i$  is constant over time it appears in both A.3.6 and A.3.7. If you subtract A.3.7 to A.3.6 for each t, you get it:

$$y_{it} - \bar{y}_i = \beta_1 (x_{it} - \bar{x}_i) + \varepsilon_{it} - \bar{\varepsilon}_i \quad (A.3.8)$$

In this way the fixed effect  $\alpha_i$  disappears from the equation, and it is possible to proceed with the pooled OLS estimation on the time-demeaned variables (Wooldridge, 2006). The OLS pooled estimator based on the time-demeaned variables is called the within,  $\beta$  estimator, and is the estimator that takes into account the individual effects but eliminates them from the model by using information for each country (or unit) for changes over time. Rewriting the equation A.3.8 for a model with several explanatory variables is now simple procedure, obtaining the following equation with time-demeaned variables for each i:

$$y_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + \dots + \beta_k x_{itk} + \varepsilon_{it} \quad (A.3.9)$$

However, the time-demeaning procedure cannot be implemented directly without having to take into account some details. In particular, a degree of freedom for the estimator within is lost due to the procedure.

The assumptions that must be valid when using the estimator within are:

- Ass. F1: For every i, the model is  $y_{it} = \beta_1 x_{it1} + \dots + \beta_k x_{itk} + \alpha_i + \varepsilon_{it}$  with  $t = 1, \dots, T$  where  $\beta_k$  are the parameters to be estimated and  $\alpha_i$  is the fixed effect.
- Ass. F2: a random sample from the cross-section is used.
- Ass. F3: each explanatory variable changes over time (at least for some i) and there is no perfect linear relation between the explanatory variables.
- Ass. F4: for each t,  $E(\varepsilon_{it} | X_i, \alpha_i) = 0$
- Ass. F5:  $\text{Var}(\varepsilon_{it} | X_i, \alpha_i) = \text{Var}(\varepsilon_{it}) = \sigma^2 \varepsilon$  for each t
- Ass. F6: for every  $t \neq s$ , idiosyncratic errors are uncorrelated. Cov( $\varepsilon_{it}, \varepsilon_{is} | X_i, \alpha_i) = 0$
- Ass. F7: the errors  $\varepsilon_{it}$  are independent and identically distributed as a normal one  $(0, \sigma^2 \varepsilon)$

### F-Test

The F-test for fixed effects tests the null hypothesis that the fixed effects  $\alpha_i$  are equal in all units. Rejecting this hypothesis means that the fixed effects are non-zero. Therefore, if the null hypothesis is rejected, it can be concluded that there is a significant fixed effect or a significant increase in the goodness of the model's adaptation in the fixed effects model, and the fixed effects model is better than the model pooled OLS.

## Test Hausman

The Hausman test tests the null hypothesis that individual effects are not correlated with any regressor in the model. If the null hypothesis is rejected, it can be concluded that the individual  $\alpha_i$  effects are significantly correlated with at least one regressor in the model and therefore the random effects model is problematic. Therefore, it will be preferable to use a fixed effects model.

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**The role of Employment protection legislation  
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employment**

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## **Introduction**

The difficult condition that young people, in search of a first job, are going through in these years is not negligible. The number of unemployed is alarming. The lack of stable employment also has social consequences: young people do not have financial resources to allow them to move away from the family.

The low employment levels in Europe deserves some interest due to the seriousness of unemployment rates of young people in many Member States, especially those in the Mediterranean macro-area.

Youth employment is a central theme of activation policies, in which there is a lively political debate signed by the plurality of positions expressed by policy-makers, stakeholders and politicians.

This dissertation aims to analyse the effect of regulation on the youth employment level.

The regulation of goods and labour market is often considered as one of the main causes that have led Europe to have relatively low levels of growth and development in contrast to those of the United States. Economic regulation can be defined in general as the use of the coercive power of the government to limit the decisions of economic agents. It may include restrictions on business decisions regarding entry, exit, use of inputs, quantities and types of output produced as well as prices.

These restrictions are likely to influence the functioning of labour and product markets significantly.

Furthermore, as market forces will continue to operate even under the strictest regulatory conditions, results in labour and product markets will generally be driven by the interaction of these forces with the existing regulatory framework. Below, the focus is on a subset of government restrictions that can affect the level and composition of employment. These include (i) labour market regulations governing assumptions and decisions to dismiss companies; (ii) regulation of the product market that limits company decisions on entry and exit along with direct state intervention in the allocation of resources, through public ownership and control of companies.

## **Employment protection legislation**

In all OECD countries, some rules regulate the employment relationship between workers and companies. Those referring to dismissal practices are often included in the employment protection legislation (EPL). These rules and regulations govern: unfair dismissals, restrictions on releases for economic reasons, severance indemnity, minimum notice periods and administrative authorizations.

EPL regulations can influence the level of employment balance, as well as its dynamics on the business cycle. The OECD has published estimates, based on numerical indicators, on the degree of "rigidity" of employment protection regimes for the Member States since the beginning of the 1990s.

The OECD by EPL indicators measure the degree of narrowness of the procedures and the costs

involved resulting from both the dismissal and the administrative-economic processes that follow the recruitment of workers. Referring not only to individuals but also to groups of workers and whatever is the nature of the contract, fixed or temporary.

### Individual protection

For this area have been considered three main characteristics: notice and severance pay provision, the difficulty of dismissal and procedure inconveniences that the employer may face. These conditions are the setting under which the employer can dismiss an employee.

- Notice and severance pay provision may be different based on the characteristics and type of worker (the main class-group are: blue-collar or white collar<sup>29</sup>) or whether the motivation of dismissals is due to personal reasons or external factors. In general, both notice and severance payments tend to be higher for white-collar workers than for blue-collar ones. (OECD, 1999).
- Procedural requirements refer to the process that should be followed once the employer decides to lay off a worker and must be last until the actual termination of the contract. Countries are scored according to:
  - the delay before the notice of dismissal can start,
  - whether a written statement of the reasons for removal must be supplied;
  - whether a third party must be notified or consulted;
  - whether dismissal cannot proceed without the approval of a third party. (Nicoletti & Scarpetta, 2003).
- In the last years, almost all OECD countries have legislated remedies for unfair dismissal. The “difficulty of dismissal” includes the length of the trial period because during this period a dismissal cannot be contested for its unfairness. Moreover, it includes laying off taken without considering social factors of age or work and, also, the account is taken of the fact that, in certain cases, the labour court can decide to reinstate a worker that was previously fired wrongly.

### *Collective dismissal*

To deal with the possible social costs have been introduced the additional provision to minimise these costs This index mainly refers to further delays and procedures required that are different from those considered for individual protection.

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<sup>29</sup> A blue-collar worker is a working-class person who performs manual labour, while white-collar work may be performed in an office or other administrative setting.

### Temporary contract provisions and temporary work agencies

This component measures the restriction on the use of temporary employment by firms, considering the type of work for which these specific contracts are guaranteed and the respective duration. The indicators of the stringency of EPL for fixed-term contracts refer mainly to the maximum cumulated length of the contract and the maximum number of successive renewals.

## **Product market regulation**

The public regulation of the goods market has the effect of restricting access or the birth of new businesses by increasing entry barriers, through direct costs or bureaucratic constraints, legal limitations on the number of companies and access to the market of foreign companies.

Regulatory reforms could lead to more competitive markets, when this happens, the gap between prices and marginal costs is reduced and in the absence of other distortions that may affect the market differently, the allocation of goods and resources will become more efficient. The optimization of resource allocation will lead to more competitive markets and as a result there will be an allocation of capital and labour almost entirely dedicated to the production of those goods that consumers value the most. Naturally, higher competition on the market will lead to a closure of the market to less efficient companies, so that only the most productive companies will survive, with a consequent general increase in market efficiency (A. Alesina et al. 2005).

To allow a comparison amongst European countries and to analyze more in-depth their economic system, the OECD summarized various indicators based on the information resulted from questionnaires distributed to the officials of the Member Countries.

The indicators of PMR are not based on opinion polls and for this reason they are considered "objective". They do not focus solely on particular sectors but cover the product market rules affecting the economy in general and are controlled by the national administrations of the member countries of the OECD.

The regulation of the product market has been analyzed on three main factors:

- Regulatory barriers to international trade and investment, through explicit legal and tariff provisions;
- Direct state control of economic activities, through state participation or other types of interference in the decisions of companies in the business sector and the use of command and control regulations;

- Obstacles to private business activity, through legal restrictions on access to markets or administrative burdens and opacity that hinder the creation of businesses.

## Literature reviews

Employment movements as well as heterogeneities across countries can largely be explained by interactions between macroeconomic shocks and economic. Product market regulation and employment protection legislation are part of the equation.

There are numerous visions of the literature on the role of EPL and PMR in the economy, and several empirical studies have already been accomplished with the aim of analysing these variables and the employment effects. G. Nicoletti & S. Scarpetta (2005) study the relationship between the reforms in the product market and their impact on employment using the OECD countries as a sample in the 80s and 90s. In their analysis they take into account the different labour market policies and the interactions of the latter with product market reforms, assessing their combined impact on employment. They find that deregulating the product market has a beneficial effect on job demand, increasing competition and consequently having a positive influence on work over the long term. As also suggested by M. Cacciatore, R. Duval, G. Fiori (2012), the positive effect of the reforms is gradually manifested, on the other hand, possible layoffs are immediate. So, they take some time to reveal their final effects on the market.

The PMR refers to the narrowness and difficulty for new companies to enter the market. In particular, the study by A. Kugler & G. Pica (2003), shows how strong barriers to entry can undermine all the efforts made to deregulate the labour market to increase employment. They use a model indicating how the impact of redundancy costs is mitigated if entry barriers are more pronounced. A direct consequence of this economic phenomenon is that companies are more reluctant to create new jobs if entry barriers are stronger. Furthermore, it is shown that the rise in employment depends on the elimination of administrative costs that can hamper entrepreneurship.

While, on the one hand, the literature agrees in considering the deregulation of the product market as beneficial for the employment level, with evident reductive effects on unemployment (Berger & Danninger 2007, G. Fiori, G. Nicoletti, S. Scarpetta, F. Schiantarelli 2007). On the other hand, conflicting opinions tend to result from an analysis focused solely on the effects of EPL on the labour market.

B. Rafi (2015), analyses only the impact of flexibility in the labour market, underlining how the youth labour market participants (i.e. people from 15 to 24 years), have a more significant return in terms of job opportunities thanks to greater flexibility.

Over the years the literature tried to explain the relationship between the combined deregulation of the two markets and the employment consequences empirically. H. Berger & S. Danninger (2007) find that deregulation of EPL and PMR is beneficial for employment growth, especially when there is an interaction between the reforms of the two markets. Their results are based on a national sample of the Organization for Economic Cooperation and Development from 1990 to 2004. Moreover, from their results, it is highlighted that labour market liberalisation produces a higher employment increase when the product market is competitive, and the same can be said for the opposite case. On the contrary, B. Amable, L. Demmou and D. Gatti (2011), provide new evidence on the relationship between deregulation and employment and inactivity. The authors use a dynamic model by providing evidence of how greater flexibility in the labour market makes the effects of deregulation of the product market weaker, also proving that EPL provides a beneficial effect on the employment level. They conclude that EPL and PMR appear to be substitutes instead of complementary forms of regulation.

## Data

To study a possible interaction between EPL along with the PMR on the youth employment rate it is indispensable to start from a database containing a sufficient number of relevant data. In particular, in the analysis developed it has been decided to analyse data from 22 Countries<sup>30</sup>, almost all European, from 1998 to 2013. For practical reasons, to each element of the list of countries is assigned an index, which ranges from 1 to 16. Therefore, a set of panel data is set up with an index unit for Country ( $i = 1 \rightarrow I = 22$ ) and a time index variable for Year ( $t = 1 \rightarrow T = 16$ ). However, many other factors are likely to affect youth employment over regulations.

I do not consider simple bivariate correlations, and I estimate a structural model of employment including some explanatory variables in addition to EPL and product market regulations.

Control variables have been chosen depending on the availability of the data and based on previous research, for the creation of the dataset adopted in the analysis, the source used is the OECD.

Following G. Nicoletti & S. Scarpetta (2003) the control variables chosen, have been those for which data exist for almost all countries over our time-period and that have a high explanatory potential.

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<sup>30</sup> Italy-Germany-France-Austria-Belgium-Portugal-Spain-Netherland-Ireland-Finland-Greece- Slovak Republic-Slovenia-Iceland-Norway-Sweden-UK-Denmark-Czech Republic-Hungary-Poland-Switzerland.

## Methodology

Labour market reforms probably should have a more direct effect on employment, while the transmission mechanism on employment could be more complicated (Bordon et al. 2016). In the analysis, I examined the impact of the most influential employment determinants, focus on the employment protection legislation and product market regulation.

The first set of estimations aims to give an introductory look at the variables of interest, using the OLS method with Time-Series Cross-Section (TSCS) data I want to see the relationship between youth employment rate and its determinants:

$$Ye_{it} = \beta_0 + \beta_1 EPL_{it} + \beta_2 PMR_{it} + \beta_3 X_{it} + \beta_4 Z_{it} + \varepsilon_{it} \quad (1)$$

---

Where  $Ye_{it}$  is the youth employment rate in country  $i$  at time  $t$ , PMR represents the product market regulation index; EPL is the employment protection legislation indicator;  $X$  is the variables' control group for other labour market policies (vocational programme, replacement rate and union density);  $Z$  is a vector of control variables for macroeconomic factors (GDP gap, inflation and labour productivity) and  $\varepsilon_{it}$  is the error term. Testing hypotheses regarding youth employment rates involve specific problems related to the use of Time-Series Cross-Section (TSCS) data. A well-known problem is heterogeneity of panel data. To deal with heterogeneity, I included fixed effects in all the next estimation, using  $\gamma_t$  as set of time fixed effect. Furthermore, some heterogeneity across countries can be omitted or not adequately captured by our explanatory variables. To control for this potential bias and to account for the specific characteristics of countries, all variables are estimated using the difference with respect to the country mean. Adopting this methodology is possible to control for the business cycle and other unobservable country-specific effects and trends, and general time-specific effects.

$$(Ye_{it} - \bar{Ye}_i) = \beta_0 + \beta_1 (EPL_{it} - \bar{EPL}_i) + \beta_2 (PMR_{it} - \bar{PMR}_i) + \beta_3 (X_{it} - \bar{X}_i) + \beta_4 (Z_{it} - \bar{Z}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) + \gamma_t \quad (2)$$

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Before proceeding with the estimation of the results, we must address some problems of endogeneity that may arise when we use different explanatory variables in a panel data analysis. Remaining

faithful to what literature reports, there could be problems depending on when structural reform is implemented. This could lead to distorted results due to reverse causality. In our specific case, it would be difficult to distinguish the effect on youth employment rate of a reform conducted just before an economic recovery from the impact of the recovery itself. In this case, endogeneity would result in an upward trend in estimates. The opposite is true if the reform is implemented just before a recession. In our time frame, the spread of the subprime mortgage crisis in Europe at the end of 2007, might lead to bias problem. To check that the results do not reflect reverse causality from employment to institutions, I carry out Granger-causality tests<sup>31</sup> for the main institutional variables. It shows not only that there is no evidence of reverse causality effects, but also that there is no evidence that structural reforms are endogenous to the economic environment, this absence of endogeneity could be explained by the fact that the regression estimates the impact of EPL and PMR level in year  $t$  on the level of youth employment rate on the same year (C. Piton, 2018).

Two other potential issue, which can usually be found in similar analysis, might be serial correlation in the residual and multicollinearity. I dealt with the former problem by testing my regression using *Wooldridge test* for serial correlation in panel data<sup>32</sup>. Serial correlation refers to a situation where the error term is autocorrelated; this means that the error term of an observation at time  $t$  is influenced by other observation at time  $t-j$ . The results did not find any evidence of serial correlation and baseline coefficients are not biased by it. Multicollinearity, on the other hand, refers to a situation where there is either an exact or approximately linear relationship between the independent variables. Multicollinearity by itself does not bias the fitted coefficients in a regression model but, conversely, it biases the standard errors upwards, of those fitted coefficients. It inflates the size of the confidence intervals in terms of their length. Therefore, it tends to bias student *t-statistic test* downwards and creates a problematic situation regarding the evaluation of a regression model. I assess whether there was or not the presence of multicollinearity problem by computing the variance inflation factors. None of the factors results to have a collinearity problem. Thus, we can conclude that the model is characterised by the absence of multicollinearity issue.

Another problem that we may encounter in time-series cross-section data is the right choice of estimation technique and heteroscedasticity issue. In fact, if there is the presence of heteroscedasticity, the OLS estimator is still unbiased and consistent but they have no longer minimum variance, and it is not efficient anymore. The dataset is characterised by a restricted number of observations, and the standard generalised least square approach of Parks might produce standard

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<sup>31</sup> Using Stata command: `xtgcause`.

<sup>32</sup> Wooldridge test for autocorrelation in panel data. H0: no first order autocorrelation  
Prob > F = 0.0000

errors extremely overconfident. “*The Parks estimator may understate variability by between 50% and 300% in a practical research situation*” (Beck & Katz, 1995). Therefore, they propose to retain OLS parameter estimates but replace the OLS standard errors with a panel-corrected standard error. Applying this new approach, we may be able to account for panel heteroscedasticity.

## **Results**

### **Baseline regressions**

*Table 1* shows the main regressions used to estimate the impact of the EPL and PMR on youth employment. In the first column are inserted results obtained using a simple OLS approach. From the results, we can see how both employment protection legislation and product market regulation have a negative impact on youth employment. However, these estimates are distorted due to the related econometric problems mentioned above. In fact, moving our attention to the second column we can see how, using the panel corrected standard error, the standard error reported for each variable in parentheses seems to be decreased although the absolute value of the coefficients is similar in the two regressions. Now, the results should be more accurate. Despite this first attempt, issue of heterogeneity of cross-sectional units is still persistent. To address these problems, the time-fixed effect and country-fixed effect were gradually added (column 3 and 4). Now our estimate is decidedly more precise, and it is possible to give a more accurate interpretation of the results. As can be seen from column 4 of *Table 1*, a higher restriction in labour market regulation significantly reduces employment among young people. More precisely, the dependent variable results to be negatively affected by the coefficient of EPL for a value that influence more than proportionally its effect. The result impact is even more pronounced, considering product market regulation. The coefficient has a more significant impact on our dependent variable respect the case of EPL, even here the estimation of its coefficient is negative, which implies the inverse relationship between youth employment and PMR.

**Table 1: Impact of EPL and PMR on the youth employment rate**

	(1)	(2)	(3)	(4)
<i>Employment Protection</i>	-3.86*** (1.19)	-3.81*** (0.51)	-5.56*** (0.41)	-1.14** (0.51)
<i>Product Market Regulation</i>	-5.94*** (2.13)	-6.57** (1.69)	-8.45*** (1.77)	-2.50*** (0.47)
<i>Estimator</i>	OLS	OLS	OLS	FE
<i>Panel-corrected S.E.</i>	No	Yes	Yes	Yes
<i>Control Variables</i>	Yes	Yes	Yes	Yes
<i>Country Fixed effects</i>	No	No	No	Yes
<i>Year Fixed effects</i>	No	No	Yes	Yes
<i>R<sup>2</sup></i>	0.48	0.49	0.46	0.89
<i>Number of observations</i>	305	305	305	305

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

## Robustness check and the crisis' effects

To ensure the validity of these results, I proceeded to carry out checks of robustness with reference to the method chosen to analyse the effects of youth employment. To verify that this method is the most suitable to continue the analysis, I tried to investigate the robustness of the results to alternative estimation methods. As suggested by the literature (Fiori et al 2007), I used random effects estimators to capture the homogeneous institutions over time, for the sole purpose of testing its validity in comparison with the previously described fixed effect method through the *Hausman test*. It rejects the consistency of estimates, suggesting that more reliable estimates are obtained using fixed effects. This is not surprising since institutional variables are probably not related to country effects, since they include other unverified invariant institutions over time; a condition required for the consistency of the random effect estimator (A. Bassanini & R. Duval, 2009).

The financial and economic crisis that began in 2008 in the American sub-prime mortgage market which consequently hit the real economy, spread all over the world, but the impact was somewhat heterogeneous among the various countries. Nations responded differently to the crisis and with varying degrees of success. Some factors moderated its impact on individual countries labour market (W. Eichhorst et al. 2010). Among these variables there are various reforms in the regulation of the goods and labour market. So, I thought it would be interesting to examine the effect of regulation in the years before and after the economic crisis. In *Table 2*, you can visually see these differences. The sample was branched into two reference periods, but the countries being analysed remain unchanged. The first column presents an analysis for the period from 1998 to 2007, in the second column while the reference period includes the years from 2008 to 2013.

**Table 2: EPL and PMR performance before and during the crisis**

	<i>Pre-crisis regression</i>	<i>During-crisis regression</i>
<i>Employment Protection</i>	-1.60** (0.91)	3.65** (1.66)
<i>Product Regulation</i>	-1.75* (1.05)	-1.20* (1.18)
<i>Estimator</i>	FE	FE
<i>Country Fixed effects</i>	Yes	Yes
<i>Year Fixed effects</i>	Yes	Yes
<i>Adjusted R<sup>2</sup></i>	0.82	0.78
<i>Nb. of observations</i>	206	149

Note: (standard errors), \*significant at 90%, \*\* significant at 95%,  
\*\*\*significant at 99%.

As we can see, there are several inconsistencies in the comparison of the two samples. Starting from the analysis of the PMR, although there are very similar results considering both the coefficient and the standard error, in the second column this variable becomes slightly lower but maintain its significance. The real difference lies, however, in the analysis of the EPL. In fact, considering only the pre-crisis period, the results tend to be congruent with those of the papers that takes into account the entire time frame, i.e. a less harsh regulation in the labour market is beneficial to increase the youth employment level. However, during the crisis, the sign of this coefficient would appear to be reversed. Now, a narrower regulation corresponds to an increase in employment. This increase should be seen not only in the recruitment of new personnel but also as a relative reduction in redundancies. In other words, during the years of the crisis, a greater narrowness in the possibility of firing, due to more extensive economic consequences for employers, corresponded to a more tenuous variation in the employment rate. In recent years, there has been convergence from the various European countries into labour market policies, but despite the evidence of convergence, transnational differences remain in the strength of occupational protection, labour market policies and support for the unemployed. These transnational variations are essential to explain the differences in the impact of the current economic crisis (J. Heyes, 2011). In fact, as reported by a publication of the European Commission, between 2008 and 2009, the impact on real GDP of Denmark, Sweden, Italy and Germany was very similar, nevertheless, they recorded different reductions in their employment rates (respectively - 2.4%, -2.1%, -1.2% and + 0.2%). Countries that have proven to have a high labour protection index have managed to suffer less severe reductions in their employment rate compared to those with weaker employment protection. Naturally, this effect is a consequence of an analysis that is concentrated in the short term. In fact, these mechanisms over the last few years have shown their inability to deal with crises of magnitude as large as the

one begun in 2008. In the long-run, the possibility of firing freely represents a buffer capable of mitigating the negative impacts accrued by companies, reducing the possibility of bankruptcy.

### **Regression using EPL and PMR sub-categories indices**

Using data built up by OECD, we can divide the EPL by different types of contract. For regular contracts, employment protection legislation takes into account individual or collective dismissal costs. I have estimated the different equations using the same methods used for the aggregate value. Reminded previous results, the aggregate EPL index have negative coefficients. Here, individual dismissal follows the same pattern, reflecting the same trend. We can see from *Table 3*, as individual dismissal and temporary contract have similar coefficient. Considering individual dismissal, an increase of one unit in the variable negatively affect the youth employment. Thus, deregulating this form of protection means increase the youth employment rate, as well as, an increase in the protection of temporary contract reduces the employment. The occupations of those who appear for the first time in the labour market, predominantly young, are characterised by the short duration of the contract. Therefore, deregulation this type of contract, will directly influence the youth employment rate. Deregulation for collective redundancies appears to reduce the level of employment.

As for the case of EPL, to discover the different inside effect of PMR, I run a regression considering the three types of PMR (*Table 4*). Public ownership and involvement in business operations by the Government are detrimental to the youth employment rate. An increase in State control impact with a more than proportional effect on the independent variable of youth employment rate. On this topic there are conflicting opinions from the literature, some paper finds that state controls increase the level of employment (Fiori et al. 2007, C. Piton, 2018). Other authors find no significance in their results (Boeri et al.2000).

For what concern the other two variables, we can see that, as for the State control, both have a negative coefficient, this means that a strict regulation in the barrier to trade and investment along with regulation in the barrier to entrepreneurship are significant and have a negative impact on the level of youth occupation. An increase in barrier to entrepreneurship is associated with a significant reduction in the youth employment rate. The Same pattern is followed by the barrier to trade and investment even if with a coefficient slightly lower.

**Table 3: Sub-indices of EPL on the youth employment**

	(1)	(2)	(3)
<i>E.P.L.</i>			
1) <i>Individual dism.</i>	-3.78*** (0.71)	-3.14*** (0.50)	-1.27* (0.68)
2) <i>Collective dism.</i>	-1.26* (0.68)	0.81 (0.71)	0.67*** (0.46)
3) <i>temporary employ.</i>	-5.23*** (0.47)	-4.97*** (0.38)	-1.32** (0.55)
<i>P.M.R.</i>	-3.83** (1.32)	-8.97*** (1.43)	-2.95*** (0.57)
<i>Panel-corrected S.E. Estimator</i>	Yes OLS	Yes OLS	Yes FE
<i>Control Variables</i>	Yes	Yes	Yes
<i>Country Fixed effects</i>	No	No	Yes
<i>Year Fixed effects</i>	No	Yes	Yes
<i>R<sup>2</sup></i>	0.41	0.52	0.87
<i>N. observations</i>	293	293	293

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

**Table 4: Sub-indices of PMR on the youth employment rate**

	(1)	(2)	(3)
<i>P.M.R.</i>			
1) <i>State Control</i>	-4.20*** (1.39)	-6.38*** (1.21)	-2.59* (0.33)
2) <i>Barrier to entrepr.</i>	-2.03 (1.40)	-6.31*** (1.32)	- (0.70)
3) <i>Barrier to trade</i>	-3.82* (2.33)	-4.78*** (1.77)	-1.13 (0.42)
<i>E.P.L.</i>	-9.86** (1.02)	-8.54*** (0.89)	-1.22 (0.99)
<i>Panel-corrected S.E. Estimator</i>	Yes OLS	Yes OLS	Yes FE
<i>Control Variables</i>	Yes	Yes	Yes
<i>Country Fixed effects</i>	No	No	Yes
<i>Year Fixed effects</i>	No	Yes	Yes
<i>R<sup>2</sup></i>	0.41	0.52	0.87
<i>N. observations</i>	293	293	293

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

## Employment by types of worker: considering gender and educational level

I will analyse and compare the results between youth employment (*Table 1*) and adult employment. As a reference sample for the latter group, I used OSCE data and Eurostat data as a source, taking into consideration the age group between 25 and 64 years.

Young people are the category most affected by low-level of employment, particularly by long-term unemployment. In 2016, 5.5% of the active population of young people in Europe between the ages of 15 and 24 had long been unemployed. The experimentation of long-term unemployment in a young person can significantly affect not only the prospects of earning, with the risk of being employed in semi-skilled or even unqualified occupations but also on the size of the young's well-being. Reducing overall satisfaction with life and increasing the risk of social exclusion (Eurofound, 2017). Therefore, a significant impact had as a consequence of a deregulation in the labour and products market with regard to the increase in youth employment, could be an asset not only in the short term through direct employment of young people in the labour market. However, it could also result in an investment in the future workforce and social integration of these people. Analysing the first column of *Table 5*, we note that both EPL and PMR have a negative coefficient and therefore negatively affect the general employment level. However, if for the EPL, the impact of the latter is likely to be similar in the two different samples (compare the results with column 4 of *Table 1*) a substantial difference is viewed regarding the PMR.

If for the general employment its coefficient is -1.42, with reference to the employment of youth there is a result that corresponds to almost double. Therefore, deregulation in the product market is beneficial for employment levels in general, but the major impact resulting from these policies translates into a considerable increase in youth employment.

Considering now, the differences in adult employment and analysing them by gender, the results show a larger effect of structural reforms on women. Looking at the coefficient of those variables we can see a net difference in favour of the female sample. Regarding PMR, we can notice a similar impact on the gender, women seem to be more affected by the increase in the PMR index than men. I will analyse separately, the effects of EPL and PMR considering employment by gender and by the level of education, using FE regression.

To construct this sample, I used people aged between 15 and 39. Three categories are considered for the level of education: The low educational level that corresponds to pre-primary education until lower secondary school (levels 0-2 of the ISCED). Middle education, that takes into account a sample from upper secondary education to post-secondary non-tertiary education (levels 3-4). In the end, the high education level, that corresponds to first and second stages of tertiary education, including programmes designed to provide advanced academic knowledge, among which master's degree, and programme designed to lead to an advanced research qualification, such as doctoral programme (levels 5-8). These categories are based on the International Standard Classification of Education (ISCED)<sup>33</sup>.

The first two levels of education are similarly impacted by reforms in product market regulation for both genders. Whereas, considering the EPL indicator, it loses its significance for a lower level of instruction when we consider males' employment, the same happens for females' average level of education. However, how we can see for the total employment, the coefficient is still significant. A reverse effect we can notice with reference to the last category. It seems that higher regulation in both EPL and PMR is beneficial for males as well as for females. This response is confirmed by the results of total employment in *Table 5*. The reason behind may be that when the PMR is very strict only the most competitive workers on the labour force are able to find a job; this category is represented by the people with the highest level of instruction.

The difference in the impact of the reforms related to the gender still remain for each section considered; men seem to receive a greater benefit from deregulation in comparison to the female counterpart. Even considering the impact of ISCED 5-8, when the effect for the EPL and PMR becomes positive, the female counterpart receives less benefit compared with men.

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<sup>33</sup> ISCED is the reference international classification for organising education programmes and related qualifications by levels and fields.

*Table 5: Impact of EPL and PMR on employment rate for different type of workers*

	Adult employment			Youth employment by education								
	Total	Gender		Total	Males			Females				
	General	Female	Male	Isced 0-2	Isced 3-4	Isced 5-8	Isced 0-2	Isced 3-4	Isced 5-8	Isced 0-2	Isced 3-4	Isced 5-8
<i>Employment Protection</i>	-1.15*** (0.34)	-2.37*** (0.61)	-0.72*** (0.32)	-0.85* (0.74)	-0.57* (0.41)	0.75** (0.99)	0.73 (0.81)	-0.73* (0.70)	1.34*** (0.33)	-1.49** (0.75)	-0.46 (0.47)	0.62** (0.53)
<i>Product Regulation</i> <i>Market</i>	-1.42*** (0.31)	-2.39*** (0.59)	-0.42*** (0.19)	-2.48** (1.14)	-3.48*** (0.66)	1.86*** (0.38)	-2.20*** (1.17)	-3.47*** (0.95)	2.75*** (0.25)	-2.75*** (1.12)	-3.30*** (0.54)	1.12*** (0.44)
<i>Estimator</i>	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
<i>Control Variables</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R<sup>2</sup></i>	0.84	0.83	0.80	0.86	0.81	0.78	0.86	0.82	0.79	0.82	0.85	0.79
<i>Number of observations</i>	295	295	295	304	304	304	304	304	304	304	304	304

Note: (standard errors), \*significant at 90%, \*\* significant at 95%, \*\*\*significant at 99%.

## Conclusions

This dissertation aimed to examine the leading causes of youth employment in the last twenty years, it focuses on the impact that the deregulation of the product and labour market may have on employment levels.

For the empirical analysis, I used 22 OECD countries between 1998 and 2013. My primary concern was the possibility that the economic crisis could distort my results due to endogeneity problems. As consequence, deregulation could have been endogenous to the economic environment. However, using appropriate tests, this problem was immediately excluded.

The first approach at the analysis has been carried out by taking into account both country and time fixed effect and trying to solve variable endogeneity problems. The results are clear: deregulation of the product market has a positive impact on youth employment, as well as the deregulation of the labour market. However, we must consider that, in the last period of the sample, significant liberalisation reforms have been implemented in several European countries. As confirmed by the results of Cacciatore et al. (2016), the deregulation of the labour market could have adverse effects on employment in the short-term. These results are confirmed in the employment analysis of the crisis period, the coefficient of the EPL is positively correlated with higher employment levels. The reason behind could be an impact of the reform on the short-term employment level. This increase should be considered not only as the recruitment of new personnel but also as a relative reduction in redundancies.

This document seeks to provide further analysis, distinguishing workers by sex and education and trying to compare the youth and adult samples. The results show that the effects of the reforms have greater consequences if we consider the female cluster or if we examine the youth employment compared to the adult. Furthermore, it is highlighted how the effect of higher flexibility and reduced narrowness in the product market impacts differently on the samples subdivided according to the corresponding level of education. If the effects of deregulation appear to have a positive impact on employment regarding the less educated sample as well as the one concerning a medium education, the opposite occurs taking into account the sample of the most educated. Further research on the subject can be done. First of all, we could investigate more in depth the causes of employment related to the level of education. Furthermore, for a more detailed analysis, we could consider the inactivity rate among young people and see how it affects employment levels.