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**The youth employment rate and the role of minimum wage, labor market policies and institutions: theory and estimates.**

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## **Chapter 1 :Youth Employment: general outlook.**

### **1.1 Defining youth.**

Considering Standard Definition of United Nations, young people are that one aged from 15 to 24 inclusive. However, there is a need to underline as practically this definition changes from country to country, considering also cultural, institutional and political factors. In developed countries and in the Central and in The Eastern European economies, the lower age limit is equal to the statutory minimum during school living age, however, the higher limit vary significantly between countries. For example, if we consider United Kingdom's New Deal, for young it considers people from 18 to 24 years old( with a special treatment from 16 to 17), while in Italy it dramatically changes, considering people from 14-29(in the north), and 14-32( in the south). Developing countries often don't have minimum school-leaving age; this is one the most important cause which determines early labor market experience for young people<sup>1</sup> . In Germany, for example, the rate of those aged (16-24) is approximately the same as the adults; which meaning that dual apprenticeship system is working in good way<sup>2</sup>.

#### **1.1.1 OECD Countries.**

In the countries of the Organization for the Economics Co-operation and Development (OECD) the unemployment rate of young people was 20.5 points percentage in 2013, while for adults this has been estimated to be 7.2 per cent (so more than double of youth are unemployed).

If it possible, for developing countries data show a worse situation, above all if we consider women.

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<sup>1</sup> In this study we are not going to study child labor issue.

<sup>2</sup> In Chapter 2, this topic will be discussed in very detailed way; its effect on youth employment rate is going to be estimated.

### **1.1.2 Middle East.**

The Middle East has the highest youth unemployment rate of all regions. More than one in four economically active young people are unemployed. The youth unemployment rate is estimated at 28.6 per cent, and is projected to increase gradually to 30.00 per cent in 2018. Together with North Africa, The Middle East is one of the two regions in which the total unemployment rate (across all age groups) exceed 10.2 in 2014; however given the high youth-to adults ratio of unemployment rate (4.0), as well as the youthful population in this region, youth bear the brunt of the unemployment problem, constituting the 45 per cent of unemployed.

### **1.1.3 North Africa.**

As in the Middle East, the youth unemployment rate in North Africa is very high, at 25.00 per cent in 2014. The unemployment rate for young women is even higher, at 38.0 per cent, compared with 18.5 per cent for young men in 2014.

Despite the disadvantages position of young people, their share of total unemployment has been (slowly) decreasing due to demographic changes; in particular the share of youth in the population has been falling. In 2000, one in three persons of working age population were aged between 15 and 24, but this proportion dropped to 28 per cent, and it is projected to fall to one in four persons in 2015.

However, there is a need to underline that there is a great heterogeneity between countries by sex. In Morocco, in 2011 unemployment rate for male and female were fairly close (18.1 for male and 17.4 for female) while in Algeria, young women were more affected by unemployment rate than young men. The female youth unemployment rate in this country was 37.5 per cent in 2010, while the male youth unemployment rate stood at 18.7 per cent. <sup>3</sup>

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<sup>3</sup>( IL, 2011 a)

#### **1.1.4 Sub-Sahara Africa.**

In this region there has been, (and it is still in act) a strong economic growth which has influenced a positive way labor market indicators. For example, in Ghana the average growth rate is estimated of 6.5 per cent in the last ten years, and the unemployment rate decrease more than fifty per cent; additionally Ghana Labor Force Survey shows a contemporary decrease of a vulnerable employment too. It clearly shows how in the last twenty years there was a decrease from 80 to 75 per cent of vulnerable employment, and considering youth issue, the average regional unemployment rate decrease by almost 1 percentage point from 13.4 per cent to 12.3 per cent. All other developing countries show a higher decrease of vulnerable employment, but in more cases with a lower increase of economic growth. However, a common trend that is needed to underline is that the manufacture sector in several cases is a fulcrum of paid job creation, but with a lot of differences over countries.

#### **1.1.5 Asia.**

Employment in Asia and in the Pacific is estimated to increase by 1.7 point percent in 2015. Looking forward, employment growth is projected to out-space working age population growth, resulting in a slight increase in the employment to population ratio between 2009 and 2017(from 66.6 to 67.0 per cent). The labor force participation is expected to remain steady at around 70 per cent.

The unemployment rate in this region is decreasing during the last years, from an average of 6 per cent between 2000 and 2008 to around 4.3 per cent projected over the next years.

In Indonesia, the unemployment rate is at 5.8 compared with an average of 9.1 between 2000 and 2008.

Women are more likely to be unemployed than men, (6.3compared with 5.5 per cent); on the other hand in Philippines the women unemployment rate is at 7.2 per cent, almost the same also for men.

In addition, there is a need to underline how in this region youth unemployment rate remains the most important challenge: is it estimated to be 14 per cent, three times greater than adult one.



### **1.1.6 South Asia.**

Labor market in South Asia, as in the past, is dominated by informal and agricultural employment, where jobs are generally poor and unprotected. Some labor force indicators are able to explain very well the situation in this region: labor force participation is one of the lowest in the world; for youth the situation is always worse; reaching 39.6 per cent in 2014, which is an increase of education enrollment, especially in secondary schooling.

However, employment growth is stronger in the last years (1.1 in 2013 and 1.2 in 2014); above all for women. However, the official indicators are not able to clearly explain the situation, simply because, as explained before, employment is informal and under poverty conditions.

### **1.1.7 Latin America and Caribbean.**

The youth unemployment rate in Latin America and the Caribbean decreased from 17.6 per cent in 2003 to 13.5 per cent in 2008. The crisis has increased the rate to 15.4 per cent in 2009, but from 2010 the regional unemployment rate reached 12.9 in 2012. The ratio of youth to adult unemployment rate, which was 2.5 in 2000, gradually increased and now the common value is 2.8. In Argentina, for example, the ratio was 3.0 in the early years of past decades, but it reached 3.3 in 2007 and increased to 3.6 in 2011.

The youth unemployment rate in these regions has always been characterized by the level of education; however these differences are not always in favor of those with highest education. This was what exactly happened in 2012, where the youth unemployment rate for people with intermediate level of education was 7.1 points percentage, while for people with basic education level was 6.6 points percentage. In Chile, workers with a secondary level of education also have the highest unemployment rate, (7.3 per cent in October 2012, compared with 4.5 per cent for primary education workers and 3.1 per cent for workers with advanced education<sup>4</sup>).

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<sup>4</sup> ILO, 2013 B

## 1.2 A labor market for youth?

Young people have a lot of difficulties to get a job, and there are several reasons to explain this issue: -First, young workers that are new entrants in the labor market cannot compete with old ones for skills and experiences, so they can have probability to get only unskilled job.

However, the belief that one age group of worker can be replaced with another is not likely to be widespread; in several cases employees don't consider young and old workers in the same way. Some works indeed requires skills which are, or should be very common among young people, as for example adaptability, while other jobs can require more adults characteristic, such as experiences and responsibility.

There were programs explicitly designed to encourage the substitution of young work with old ones, as for example in France with the "Allocation de remplacement pour l'emploi (ARPE). Under this measure, early retirement was subsidized by the Government on condition that the employee hires a replacement under the same contractual agreement as the person retiring. Also if it was not clearly specified, applicants under 26 years of age were give special attention; this procedure was not usual but the aim was to encourage a turn-over of workforce through voluntary replacement of older workers with young ones. However, the results were not achieved: in fact the primary aim was to be able to employ 80.000 young people by the end of 1996, but the programs approached only 60.000 ones (Gineste, 1997). Then, the replacement rate was lower than expected, despite the explicit aim of the measure.

Different measures are which ones with the aim to encourage the recruitment of young people instead of existing older employers by reducing the relative cost of hiring young workers. Furthermore, Begg et al (1991) found that 80 per cent of the jobs "created" were works already existing, or which would have been created also without YTS; additionally only nine per cent of those jobs were for workers aged 19 and above, the replacement rate was between young aged 16 and 24 years old, to additionally underline as the young have also been, and continue to be a "false threat" to old workers.

### **1.2.1 The “real” estimation of youth employment.**

The “real” estimation of the unemployed in general, and in this case of youth unemployment in particular, has to be done taking into account the discouraged workers. It is very important because basically it includes to the standard definition of unemployed youth those who are not technically unemployed because they do not meet the active job search criteria but who would like to work.

There are a lot advantages to use it:

- firstly, it is able to capture information on discouraged people that are not “usefully occupied”, and would like to work if job market improve;

- secondly, in this sense we are going to have a sense of the size of the youth labor market problem in relation to the youth labor market as whole;

- thirdly, it helps in the interpretation of the employment adjustment process. For sure, if we don’t include these ones, we don’t have a real estimation of unemployment, above all for the dimension of the active labor policy that the policymakers have to do. Instead if we consider the labor market for young people in developing countries, it is very different from the developed ones.

### **1.2.2 Youth labor market in developing and developed countries.**

Youth labor market in developing economies is characterized by an increasing demand for workers, a scarcity of capital and a persistent conflict between “old way” to do economies and the modern one (it can be considered as geographical conflict, between rural and urban part of countries; this is also because the cost of workers is lower than buying or renting machinery.

Figure 1<sup>5</sup> suggests how labor market experiences and the quality of jobs for young people differ significantly between developed and developing countries. There are several reasons for these differences: there are economical, juridical and social issue to take into consideration.

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<sup>5</sup> Source; ILO website, Global Employment Trends for 2014.

Its aim is to compare aggregate data on youth labor market situation from least developed countries (LDCs)-Cambodia, Liberia, Malawi and Togo, with aggregate data from four high-income European countries(Belgium, France, the Netherlands and Portugal). In this figure youth are divided in four categories:

- A) regular employment, defined as wage and salaried workers holding a contract of unlimited duration (in the case of high-income countries), or a contract of a duration greater than 12 months (in the case of LDCs);
- B) irregular employment, defined as wage and salaried workers holding a contract of limited duration(less than 12 months in the case of LDCs and undefined in the case of the high-income countries);
- C) unemployed (relaxed definition), defined as a person currently without work and available to take up work in the week prior to the reference period;
- D) the residual inactive youth.

**Figure 1. Distribution of youth population by regular and irregular employment, unemployment (relaxed definition and inactivity for four LDCs and four high-income countries (%).**

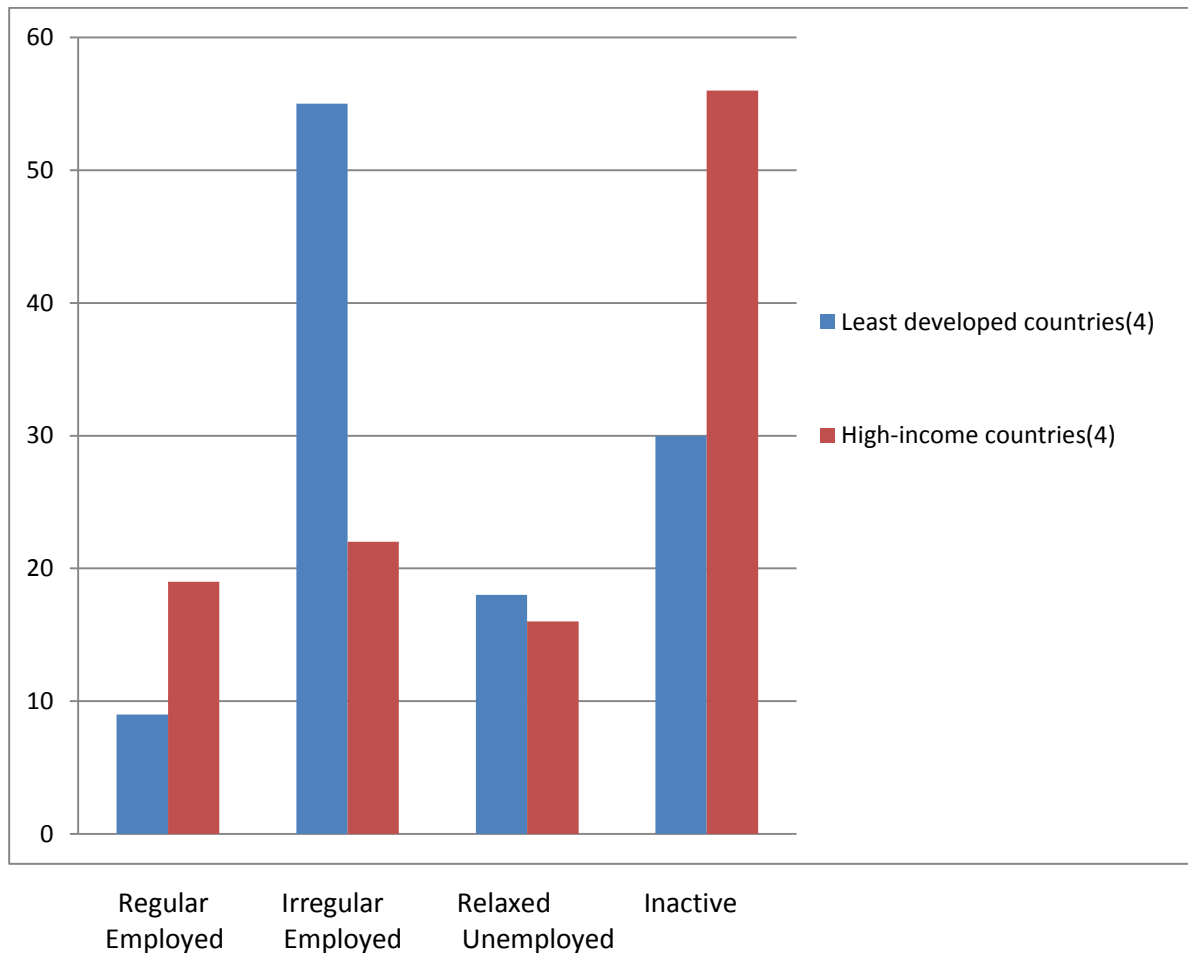


Figure 1 suggests two conclusions: first, the main differences between youth in developing economies and in developed ones are in the shares of irregular employment and inactivity. It is very important to underline because, as explained before, the size of unemployment dramatically changes. Second, when we use the relaxed definitions of unemployment, rates are more similar, the explanation has to be found in the level of educational attainment: in developed economies generally young people go to school and complete at least secondary level of education, while in developing ones, educational

enrolment remains low and educational attainment levels are still extremely low, with small proportion of youth attaining a secondary education. The mean of educational attainment among the young Population in Cambodia, Liberia, Malawi and Togo in 2013 were 6.2 per cent considering people with primary level education or lower, 33.7 for young people with secondary level of education and 4.1 per cent with higher-level degree.

The main difference between developing and developed countries is that in the last one young people are generally enrol in a school course, so they are considered as inactive, then increasing inactivity; while in developing countries young people generally are not enrolled in school, they are engaged in irregular employment. In contrast with irregular employment developed economies nine of ten are engaged in temporary wage employment.

### **1.2.3 The incidence of job part-time.**

For OECD, the incidence of part-time work for youth increase from 20.8 per cent in 2000 to 29.3 per cent in 2011 per cent from 2000 to 22.3 per cent in 2008, but it increased to 25 per cent in the 2011. In North America youth part time employment grew from 18 per cent, so there was a widespread use of part-time job: in fact in 2000 the young part time workers were the 28.4 per cent of the full time ones and in 2009 they were the 34.3 per cent, but instead in European Countries, the percentage decrease from the 2010 to the 2011 (in the midst of the crisis). For all these reasons, youth employment policies are the highest priority, with a particular target on first job-seekers. To win this that can be defined as the crisis of the youth, there is a need to extend the youth employment policies to those countries don't yet have actuated this type of policy. The area where is most important to intervene is area that regard macroeconomic and sector policies, social dialogue and partnership for youth employment, labor standard and social protection for young people.

### **1.3 Youth employment and skills mismatch in advanced economies.**

The issue of skill mismatch has always received more attention in the advanced economies due to economic crisis; however various form of skill mismatch are always present in the labor market. Skill demand and supply are influenced by a range of factors including for example the level of economic development of a country and technological change. For this reason, the implementation/formulation of effective education and training policies are become really important above all after the crisis.

However, in this chapter will be analyzed only two types of skills mismatch<sup>6</sup>. It are due simply because they are really common for young people and for this reason they have been included: the first one has the aim to compare the level of school education between employed and unemployed. As primary comment, there is a high risk of mismatch for those at the bottom at the educational pyramid. The second type consists in the mismatch between jobs held by young works and the qualifications they possess. The main result is that type of mismatch are that youth (meaning in this case people aged from 15-29) are more likely to be exposed to over-education than workers aged 30 and above.

#### **1.3.1 Skill mismatch between labor supply and demand.**

The skill mismatch between labor supply and demand of skill has been quantified using an index called “Duncan and Duncan index of dissimilarity<sup>7</sup>”. Its aim is to compare the structure of educational achievement of the employed and unemployed, capturing the mismatch if unemployment rates differ among workers with different level of education achievement<sup>8</sup>. This index has a range equal from 0(no mismatch) to 100(full mismatch), with value equal zero if workers with primary, secondary and tertiary education have the same rate of unemployment rate.

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<sup>6</sup> However, there is a need to underline that that there is no agreed definition of skills mismatch. It is a term which refers to various types’ imbalances between skills offered and skills needed in the world of the word. Additionally, each type of mismatch can be measured in several ways, with relative advantages disadvantages. Taking in consideration these issue, the choice has been to analyze the mismatches describe in the chapter.

<sup>7</sup> It is the most widely index know to measure segregation by sex( Anker, Melkas and Korten, 2003)

<sup>8</sup> For more detail about it use, see Johansen and Gatelli(2012)

Several type of this skill mismatch has been seen among countries. Considering as sample of 28 European Countries, skill mismatch was less than 10 per cent in 8 countries in 2011, exceed 20 in four Countries (Belgium, Finland, Luxembourg and Sweden). Furthermore, there is a need to underline that this skill percentage of skill mismatch is not an indication of quality of school system, because if it would have been really of high quality, it would improve the employability of workers.

A high level of mismatch corresponds to wide differences between unemployment rates between youth with different level of education.

Considering Sweden , for example, the youth unemployment rate with primary education or lower is equal to 38.6, is more than three times the rate for youth with tertiary education(12.4 per cent). However, there is a need to underline as there is also example of countries with more similar problem of unemployment rate by level of education, which is reflected in a low value of the mismatch index. In Switzerland, for example, the index was 1.6 per cent in 2011. The youth unemployment rate with primary education was 7.8 per cent in 2011 on this country, compared with 7.5 per cent for you with secondary education and 8.5 per cent for youth with tertiary education. As explained before, Belgium has a relatively high level of mismatch; it is increasing in the recent years because of deteriorating position of workers with a low level of education. The youth unemployment rate for workers with primary education in Belgium increased from 2009 to 2011(from 30.2 to 31 per cent). This trend has been confirmed by the whole 28 countries, the unemployment rate for youth with primary education increased, while the unemployment rate for youth with tertiary education decreased in 17 out of 28 countries.



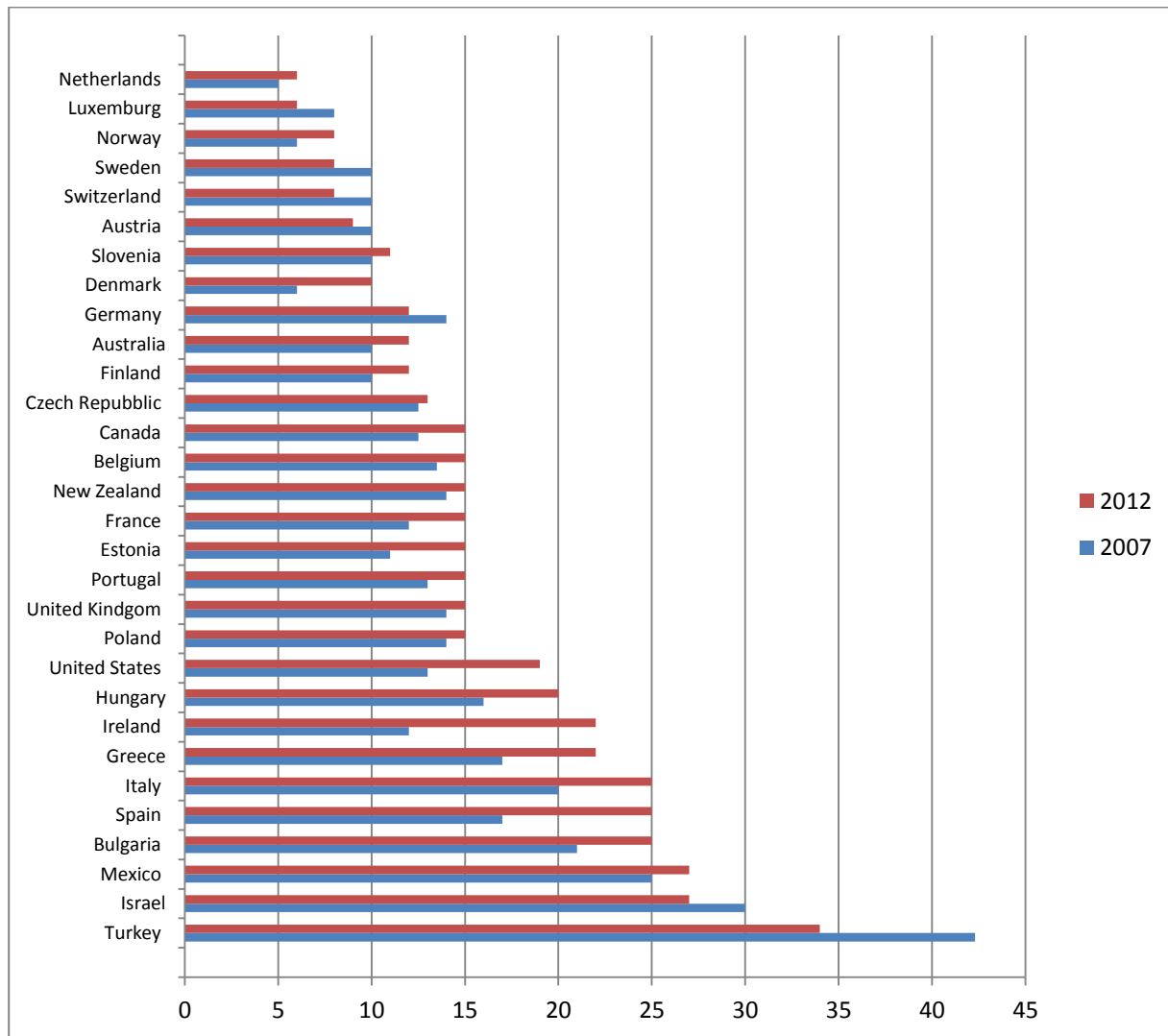
### **1.3.2 Skill mismatch by occupation.**

Another type of skill mismatch, very linked with labor supply and demand, is the skill match between the skills that young people have and skills required in their job. In fact some (a lot) workers can be undereducated or overeducated for their jobs. Regarding the issue of over education, this type of mismatch has been rising in many countries; it can be explained by competition for jobs, which pushes the better educated into jobs or occupations with lower remuneration usually taken by people with lower education. Furthermore, there is a need to underline that this type of skills mismatch has negative implications and they are going to increase in times of economic and labor market crisis.

### **1.4 NEET young people.**

NEET young people are which ones that are employed, neither in education nor in training aged 15-29. Its rates have risen in 30 of 40 countries with data available to ILO. It is very important issue to take into consideration, mainly because it is a very feature of young people that, after completing their high school, are forced to be in this “State”, without having possibilities to avoid it. NEET people have to be distinguished from the newly coined NLEET use in 2013 in Global Employment rate for youth by International labor Organization. It include young people “neither in labor force nor in education, employment and training”. It is similar to NEET but excludes the unemployed since they are still included in labor force. The figure 2 shows the latest result by IL considering their “relaxed” definition of NLEET:

**Figure2: Young People that are neither in employment, nor education or training (NEET) as the share of population age 15-29(2007 and 2012)<sup>9</sup>, considering relaxing definition.**



<sup>9</sup> Source: ILO (2013, table 10C).

### **1.4.1 Policies for youth employment.**

Youth Employment crisis won't have solution without strong youth employment policies which will lead to employment growth; this requires coordinated policy efforts to support aggregate demand via macroeconomic policies, and expansion of domestic economies.

Furthermore, also policies which increase productive investment and improve access to finance can have a positive impact on young's people employment prospects; this can be done through:

- Encouraging economic diversification;
- reducing macroeconomic volatility;
- helping people for access to credit for enterprises(micro-small and medium sized);
- having funding for targeted youth employment interventions.

Also if we have to underline that there are several sectors have been identified with a high job-creation potential, such as green economy, health and social care, information and communication. To confirmation of this also an econometric analysis about the impact of macroeconomic determinants on youth employment has been done by Matsumoto ET all (2012).

They affirmed that higher is investment; lower is the youth unemployment rate in both industrialized and low and middle-income economies. However, investment is strongly linked to access and cost of credit: when banks don't want to lend money, or they want to lend only with a high interest rate, firms have more difficult to hire young workers.

Furthermore, also policies that offer fiscal incentives, support development of infrastructure can offer a wide range of youth employment opportunity.

### **1.4.2 Policies for training and education.**

Training and education are very important for youth employment outcomes. Despite significant improvements in educational attainment, there are several countries (above all developed ones), in which people have lower level of education. In order to respond to labor market requirements, training and skills via education should ensure skills which are useful for employment. The presence of work-experience components in technical vocational education and training (TVET) is very useful

because it increases the capacity of trainers to improve their skills. Also the employment services have a significant role to help people from school to work transition. In particular, through individual career guidance, the preparation of functional curriculum vitae and support in the development of employment plans, can be very useful for young people for the first time (and not only in labor market). These services can be realized also in collaboration with education institutions providing their career guidance; detailed occupation information, including clear indications of main duties, environmental factors, and salary range for the various entry points.

### **1.4.2.1 Dual apprenticeship system.**

The “dual system” of apprenticeship combines school-based education with in-company training. It is a system of learning for work in Austria, Denmark, Germany, and Switzerland. In these countries, low youth employment rate is often attributed to the effectiveness of this system, which provides a lot of young people with high education and training recognizing qualifications demanded by enterprise. The content of the German system includes the following features:

- The content of training is determined jointly by government, representatives of employer’s organization and trade union at federal level;

- Individual firms choose their own training methods;

- Training costs are shared between the government and employers; in particular governments covers the school-based component; employers finance enterprise-based training);

- Qualifications are awarded upon completion of written and practical exams, set and marked by tripartite external examiners;

- After graduation, workers can apply to their current employer or another for employment<sup>10</sup>.

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<sup>10</sup> Source: ILO, 2011.

## 1.5 Youth targeted labor market policies.

Labor market policies and programs can be very useful to improve labor market integration of young people.

Active labor market policies (ALMP's) focusing on employment planning and job search has been really effective to help people to find a job<sup>11</sup>. These interventions usually combine education and training with work experience programs and job search assistance ,as well as incentives for employers to hire disadvantages people, as for example wage subsidies, tax cuts or social security exemptions for a limited period for employers who hire young people.'

In February 2013, the European's (EU) Council of Employment and Social Affairs Ministers approved "Youth Guarantee", with the aim to offer an employment, continued education, an apprenticeship or a traineeship within four months of leaving school or becoming unemployed. In addition, has been allocated 6 billion for the period 2014-2020 to regions where youth unemployment rate exceeds 25 per cent<sup>12</sup>.

Targeting of disadvantages group in the labor market is crucial for the design and implementation of ALMP'S. There are many examples of approaches that establish "profile" for young people, these approach also have the advantages to allocate resource more efficiently because they allow to providing intensive employment to disadvantages youth.

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<sup>11</sup> ALMP'S policies topic will be treated in very detailed way

<sup>12</sup> European Commission, 2013.

### **1.5.1 Youth guarantee as response to the youth employment crisis.**

The first countries to implement youth guarantees in the 1980s and 1990s were Denmark, Norway and Sweden; more recently, other countries are implementing it, as for example Austria, Germany, The Netherlands and Poland.

Its main aims are to promote labor market integration and prevent long-term unemployment and discouragement among young people; are broadly similar across country; also if there are some differences between programs, as for example eligibility criteria, duration of intervention and compensation.

Swedish youth guaranteed, which regarded youth unemployed aged 24 years, participating in the program in 2008 were able to find a job faster than a control group of participants in other PES measure.

Also if other evaluation are needed, and an ILO overview confirms that youth guarantee can play a very important role in reducing long term unemployment and discouragement among young man and women<sup>13</sup>. However, the same overview underlines the need of implement funds dedicated to it; ILO's cost estimates suggest that it can be implemented at an annual cost in mean between 0.5 and 1.5 per cent of GDP. The variation of costs is due by the availability of administrative infrastructure for the implementation of guarantee on large scale.

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<sup>13</sup>ILO, 2013 (d).

## 1.6 Conclusion.

The aim of this chapter is to give an overview on youth and their relative issues: firstly, as explained at the beginning, there is a need to define what “youth term”, include (and how there are several for youth in different countries). After, youth unemployment and employment rate is analyzed for all worlds: OECD Countries, Middle East, North and Sub-Sahara Africa, North and South Asia, and at the end Latin America and Caribbean. The next step is to question if really a youth labor market exist, simply because there are several obstacles (a completion with adult), that suggest that in some case youth labor market is only a utopia. And it also for this reason that the next step is to analyze youth labor market in developing and developed countries, making comparison where useful and underling differences (clearly a very important role is played by job part-time and its incidence in both markets) A part of this chapter is used to describe youth employment skills and the their mismatch between supply and demand ;but unfortunately it is not the only one: a paragraph indeed describes also skill mismatch by occupation(they are the most frequent and important mismatch in the labor, so other types have not been taken into consideration). The last part of this chapter is dedicated to analyze a most important issue that it can be considered also worse that “general” unemployment issue: in fact, it considers young people that are not in employment, but additionally, there are not in training too. In the last five years there have been a lot of policies actuated to help them to get job (via training or via occupation); and for this reason two most important programs are analyzed: Youth Guarantee and more generally, dual apprenticeship system.

## **Chapter 2 : Minimum wage, labor market institutions and policies: a cross sectional analysis on their impact on youth employment from OECD countries.**

### **2.1 Labor market institutions: definition.**

The laws, practices and policies which can be defined as labor market institution determining which type of legal contract is permissible, set boundaries for wages and benefits , hours and working conditions; define the roles of collective representation and bargaining, providing social protection for workers are called labor market institutions. The existence of these institutions is due to the imperfect information, not equal market power between employee and worker, discrimination and inadequacies of the market to provide insurance for employment-related risks. They were born in the second half of the 19th century after the industrialization of Western Europe and North America

#### **2.1.1 The aims of employment protection legislation.**

Employment protection legislation (EPL) is one of the most important labor institution which provides measure job security by restricting the ability of employer to hire worker with the aim of determine work and by making dismissal cost. In particular, the EPL regards to the method of start and end of employment. EPL provide measure of job security by restricting the ability of employer to hire worker with the aim to determine work and by making dismissal costly. Governments introduce these two



types of rules to give an insurance in the case of job loss and to give at the employee some social responsibility in the sense of assuming some commitment to the employee.<sup>14</sup>

### **2.1.2 Economic theory on EPL: the neutrality case.**

Economic theory on EPL and its no effect on employment, welfare and profit for firms, taking into consideration the neutrality case explained by Lazar(1990), which occurs when we have three conditions:

- 1 workers are risk neutral,
- 2 Wages are flexible, not wage floor, (then not minimum wage or collective agreement),
- 3 EPL consist only of the transfer component, while tax component is equal to zero.

Lazar talks about neutrality because EPL affects only the intertemporal structure of wage, leaving the net discounted value of a job unchanged. Suppose we have initially two time periods, with a wage equal to  $w$  in both periods, reminding that we are under risk neutrality assumptions and not wage floor. Now we introduce an EPL cost which employee have to pay after the two periods. The aim of the employee is to pay the same wage with and without EPL policies, so it means that he offers in the first period lower wage ( $w-B$ ), where  $B$  is the bond entitling to the worker  $TR$  in the second period.

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<sup>14</sup> OECD 2004.

### **2.1.3 Unions and collective agreements: impact and role.**

Unions and Collective agreements are probably the most difficult and controversial labor market institutions to analyze, also because they influence living standard, and in our case of interest both minimum wage and employment rate for youth. Economists have recognized several roles for the unions, above all to negotiate higher wages, better conditions and benefits; but often it can be done through efficiency costs.

## **2.2 History of trade unions.**

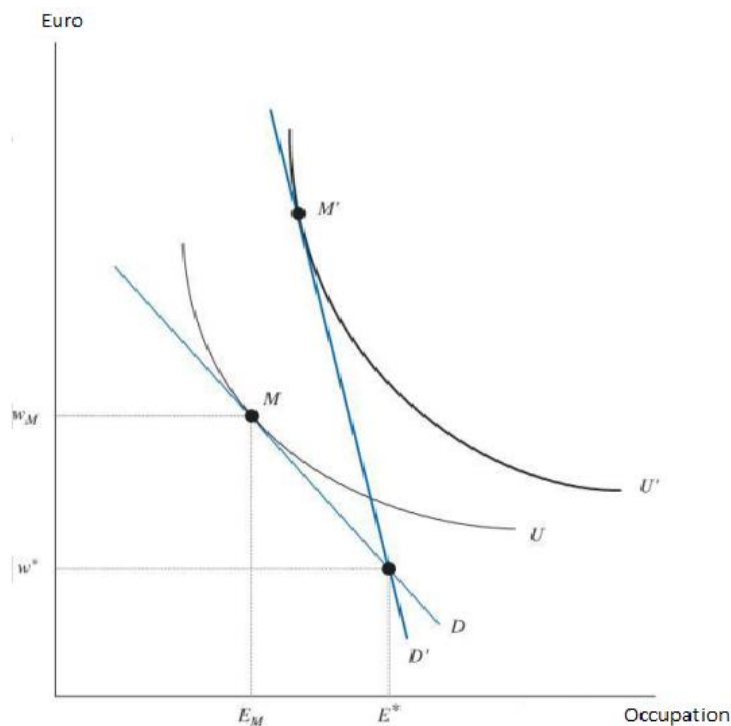
Trade unions are voluntary organizations; their aim is to protect the interests of their members. The first trade unions were born in the XVIII century in the United Kingdom with the aim to give insurance to the artisans in case of unemployment. With the passage of time, they transformed themselves into industrial trade unions to represent workers with intermediate-high skills.

Actually, joining a union depends on several factors, one of them is also the collective bargaining system. In some places we have local negotiation; in others it is national. Generally, trade unions negotiate all aspects of a contract. In detail, they have a very important role in the determination of wages (minimum if it is applied), benefits, security and insurance.

### **2.2.1 Economic analysis of the union: the utility function.**

Economic analysis of a union is based on the fact that it can be represented through a utility function, as well as an individual. A generic assumption is that the utility of a union depends positively on the wage  $W$  and Occupation  $E$ . Then the indifference curve of a union is represented in the usual form as we can see in the following diagram:

**Diagram 1**



The firm is represented by a demand of work upward which determines the optimal quantity of work, in the sense of maximization of profit, to use for any level of wage.

### 2.2.2 The assumption of monopolist union: interpretation of the graph.

At this point economists use a very strong hypothesis called hypothesis of monopolist union<sup>15</sup>: It chooses the level of wage compatible with their goals, in equal way of a monopolist which determines the price of his/her product.<sup>16</sup> If, given a wage, firms cannot transfer from demand curve, the hypothesis of union monopolist which maximizes owner utility, led to a representation of agreement between firm and union as the point M in which demand curve is tangent to the indifference curve of union U, where the competitive wage of union is  $w^*$ . Without union, firm would hire  $E^*$  work. Union instead wants a wage equal to  $w_M$  so firm cuts occupation. In that way some workers don't work, and it is clear that union would have major utility if labor demand would be

<sup>15</sup> See Borjas, Chapter 10 "Unions". Italian Version by Lorenzo Cappellari

<sup>16</sup> "Alternative hypothesis consider that also the firm can have some contractual power. In that case the equilibrium would be determined by a tug of war between firm and union." From Borjas, Chapter 10 "Unions"

inelastic, that is the firms react less because of a variation of wage. In the figure above that situation is represent by the curve  $D'$  (more inelastic than  $D$ ), and  $M'$  curve (higher wage), so union could reach an indifference curve with major utility.

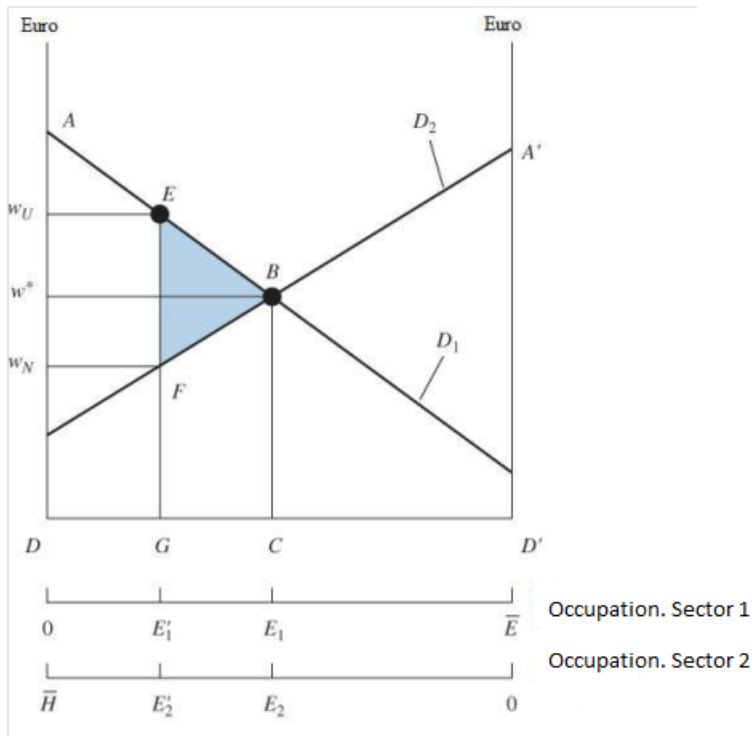
### **2.2.3 The unions and the efficiency of the labor market.**

In the sector where we have the presence of unions, the wage is higher despite of a competitive market, and so the occupation is lower. If the worker of the union market find job in a non-union market, where wage and occupation are determined by the market, the oversupply is absorbed by wage cuts.

### **2.3 What happens to the market equilibrium without unions?**

Without unions, the competitive wage is  $w^*$  and the sum of national income is given by  $ABCD$  and  $A'BCD'$ . Unions increase wage in the sectors one. Hired workers move to the sector 1 to the sector 2 decreasing wage never contract by the union  $W_{in}$ . In that case the sum of area reduced national income of the area of triangle  $EBF$ , which is defined as net loss of production because union is hiring few worker and the not-union market is hiring too many worker.

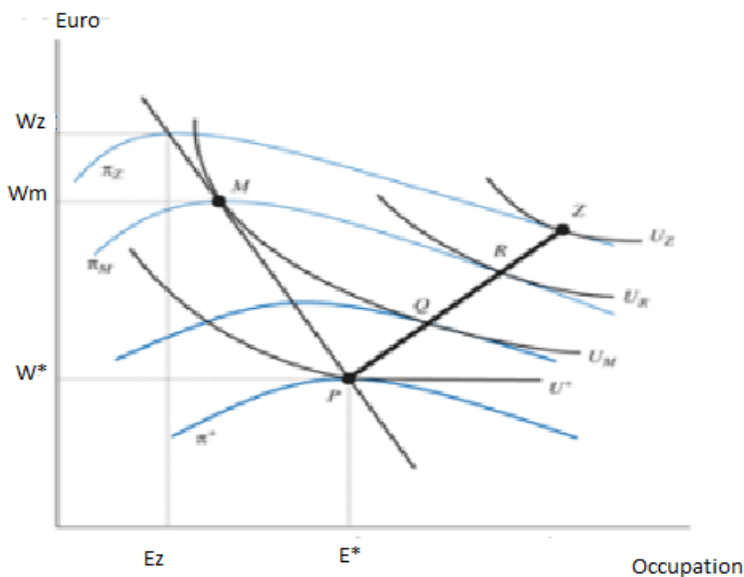
Diagram 2



### 2.3.1 Efficient contract and contract curve: Why both do firms and unions move of their initial point of equilibrium?

The following table shows because both firms and unions have an incentive to move on the equilibrium on the labor demand curve:

-Diagram 3



The competitive point of equilibrium is  $P$  (with wage  $w^*$  occupation  $E^*$  and utility of unions  $U^*$ ). The equilibrium point of Union is  $M$  where  $w_e > w^*$ ,  $m_e < E^*$  and  $U_m > U^*$ . Union accepts all contracts along the  $M$  curve and above the utility curve  $U_M$ , while the firm accepts all contracts long or under the is-profit curve  $\pi_m$ . In point  $R$ , unions is better and firm is not worse than point  $M$ . In  $Q$  point employee is better and union is not worse. Any point in line  $RQ$  is a Pareto improvement despite of equilibrium with monopolist union.

### **2.3.2 The relationship between labor Market Institutions and minimum wages.**

An important part of today's labor economics has been increasingly concerned with the issue of labor market institutions/regulations, and their interactions and impact. In particular, the interactions between minimum wage and some institutions are really evident if we consider, for example, that they cover minimum wage setting. It is the case of trade unions; they have a really and determinant impact on minimum wage (and its increase or decrease), so we cannot talk about minimum wage without consider labor market institutions and their interactions.

### **2.4 Minimum wage: A brief history-Which is its role in the global economy?**

Minimum wage was for the first time introduced in New Zealand in the late 19th Century, and now is adopted in several counties. Minimum wage can be a most important and powerful tool to support decent work goals, but it can be also crucial to improve social protection floor, poverty alleviation effort and above all equality of work. So the increasing of the minimum wage with the pass of time has become very important because it can help to rebalance the sources of growth. In the last decades there has been an increasing interest about the role of the minimum wage; for Example In Brazil it has been consider the key role to reduce poverty, while China the increasing has been considered the most important policy to reduce inequality in the country. In the United Kingdom, where the minimum wage was introduced at the beginning of the twenty-first century, it was considered as a successful Government policy. Also in the United States, the introduction and then the increasing of it was considered a redistributive tool, in the sense of equality and poverty. The increasing of the minimum wage can stimulate also domestic aggregate demand. It was the case of United States, Japan, China and Germany, where also with two different, but interconnected

strategies, were able to stimulate the aggregate demand via increase of the minimum wage. So, in this context, minimum wages if set and operated effectively can play a key role to reduce inequality and support demand transferring resources to low-paid workers. Such redistribution can have positive demand effect because the marginal propensity to invest out of profit<sup>17</sup>. For sure higher minimum wage stimulate investment by the family, because higher minimum wage above all among the low and middle income groups can lead to a virtuous cycle of greater consumption due to the increasing of power of purchase and also create more employment opportunities.

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<sup>17</sup> Herr ET all, 2009; Ludovic, 2009, Stockhammer, 2012; Stockhammer ET all 2007.



### **2.4.1 The aim of the minimum wage and its system across the world.**

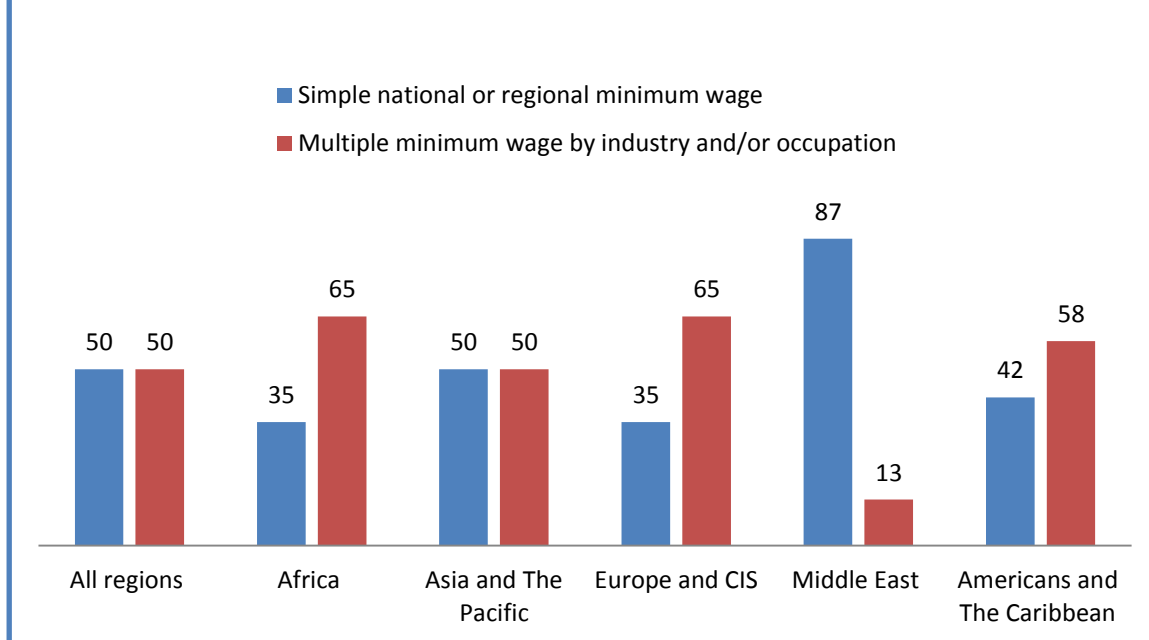
The primary aim of minimum wage has been to increase equality, but this can happen only if we increment the number of people which are “legal covered” by the minimum wage.<sup>18</sup> The ILO working condition Law report show us, as 151 countries and territories which are actually implementing the extension of the number of workers covered by the minimum wage. For sure there are differences about the method and also the time of implementation of working conditions which can vary by state. Figure 3 shows the minimum wage system across the world (the percentage covered by the simple national or regional minimum wage or by multiple minimum wages by industry).

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<sup>18</sup> With the term “legal coverage” we mean the workers which are covered by the legal minimum wage.

## Determination of Minimum wage across the world

Figure 3



The figure clearly shows as in the word the percentage of States which adapt simple or regional minimum wage is exactly the same of that one having multiple minimum wages. However, it is able also to show the difference between regions: excluding Asia and The Pacific Area, other parts are dominated by a net using of one of them.

### 2.4.2 The successful of minimum wage policy.

Another issue to consider is that the success of the policy about minimum wage depends also by the level at which it is set. If it is low, it could be not effective in the aim to ensure living standard conditions, and so, there will be no investment, consumption, then the aggregate demand would fall. But, if it increases suddenly, we could lead to inflation and hurt employment (Belser and Sobeck, 2012).

The ILO minimum wage fixing convention, 1970 number 131 at article 2 states: “Minimum wages shall have the force of law and shall not be subject to abatement, and failure to apply them shall

make the person or persons concerned liable to appropriate penal or other sanctions.”, while article 3 states: “The elements to be taken into consideration in determining the level of minimum wages shall, so far as possible and appropriate in relation to national practice and conditions, include: - (a) the needs of workers and their families, taking into account the general level of wages in the country, the cost of living, social security benefits, and the relative living standards of other social groups; - (b) economic factors, including the requirements of economic development, levels of productivity and the desirability of attaining and maintaining a high level of employment<sup>19</sup>. So in that convention the man is the centre of interest and need; the role of minimum wage should be to guarantee the satisfaction of the worker and his family. One way to fix the minimum wage is using the ratio of minimum to median wage, but however there are other instruments to do that (also if the first one is the best way to measure and then most used).

### **2.4.3 The compliance of the minimum wage.**

First off all, the degree of compliance depends on the complexity of the system. In uniform system it is easier to ensure compliance despite of system of a multiple minimum wage rate (as for example happens in Italy). Second, if there is higher minimum wage, it could encourage the informal economy. Another thing to consider is that high rate of compliance required a coherent strategy based on labor inspections, information. There are many way to measure compliance: one could be calculating the share of workers' earning less than the legal minimum wage. The rate of compliance also depends on the level at which the minimum wages are set. However, the most important thing to take into account is that if the minimum wages are set appropriately and operated effectively, the low paid worker will have benefits. It happens in some Latin American countries, where both the institution of a minimum wage and sudden its raising with effective social protection measures led to an improving of the economies of this countries.

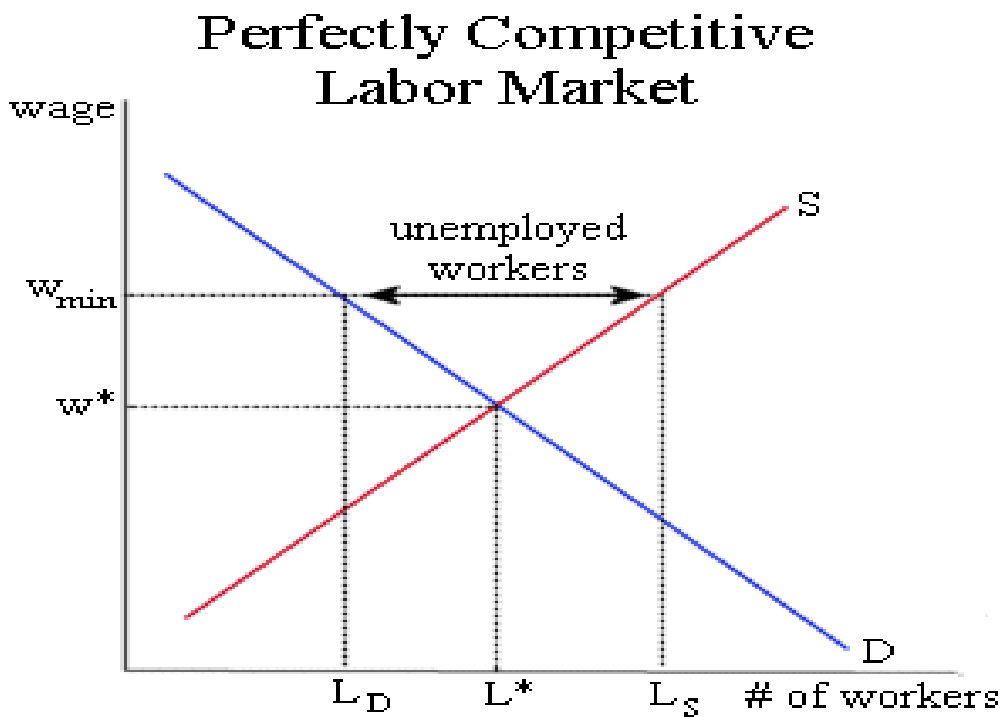
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<sup>19</sup> Furthermore, actually this convention provides for the possibility of sub-minimum wage for youth, referring to training needs.

### 2.4.4 Minimum wage and employment: competitive labor market theory.

Labor market is the place where workers and employers meet and compare wages with supply of occupation. In the perfect and competitive Labor Market the interaction between demand of work (employers) and supply (workers) give us the equilibrium level of wages and work: the level of wages and occupation that equal the number of hours which employers offer.

Diagram 4



### 2.4.5 How to interpret the graph.

As we can see, the labor supply is upwards orientated, so the substitution effects prevail on income effect. The demand is downwards orientated. The equilibrium level of wage and occupation is in the point where labor demand is equal to labor supply ( $w^*$  and  $L^*$ ). So, at equilibrium point we have  $L$  number of worker at wage equal to  $w^*$ . If the minimum wage is above to that of equilibrium, the employment unequivocally be reduced from  $L^*$  to  $L_d$ , and labor supply exceeds labor demand. The quantity of this effect depends by how much the employee are able to substitute workers with other factors(so called substitute effect); more technically it depends by the elasticity of demand, so if demand for labor is inelastic, unemployment effect could be not so much severe.

### 2.4.6 Higher minimum wage: Which are the effects?

A higher minimum wage attracts other workers, and the state of this depends by how are considered “unemployed or discourage worker”, for sure the increase of the minimum wage has the effect to “invite” other workers to become active in the search of work, but also could discourage mostly the workers because there are fewer possibilities to find a job. Impolite in 2003 showed as the competitive doesn’t tolerate much impact of a binding minimum wage if, as several empirical studies have revealed worker can adjust effort level. This theory is more similar to efficiency wage effect, in that sense the disequilibrium caused by the minimum wage in traditional model cannot persist. So in this model the introduction of minimum wage create unemployed. There are a several assumptions which make the model not realistic and the most important is the idea of perfectly competitive market.

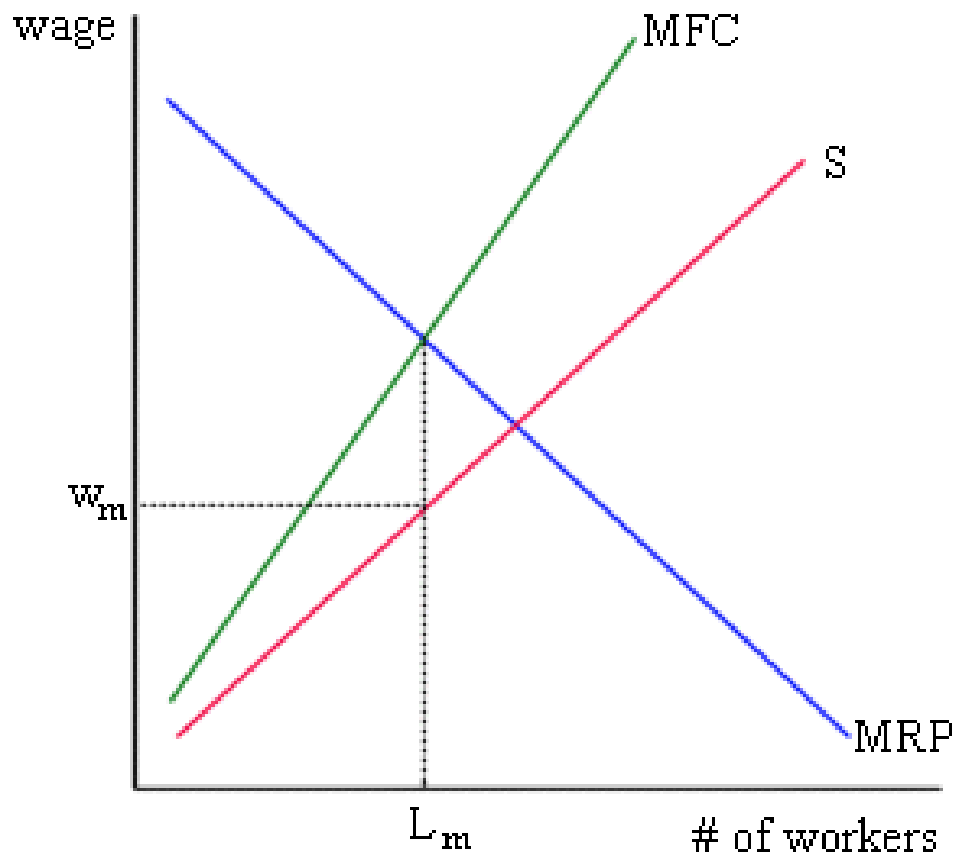
### **2.4.7 Monopsony in the labor market.**

In a non-competitive labor market characterized by several imperfections, the consequences of an introduction of a minimum wage are very difficult to predict. Introducing a minimum wage we can effectively increase employment (also for youth), but only if employees have monopolistic power, and there are some externalities connected to the job searching. A non-competitive labor market is the monopsony, where we have one employer and more workers, a situation in which an introduction of minimum wage led an opposite effect, so it increases employment instead of decrease, within some relevant range of wage. So, to attract additional labour, it has to increase wage, but instead if it decreases wage not all labor force will be lost. In the monopsony minimum wage has the role to equate marginal cost to average cost rendering a part of monopolist's supply and marginal cost of labor coincident, so eliminating the constraints posed by the rising marginal cost associated with hiring an additional worker and induces the monopolist to increase employment. However, the increasing of wage depends on the elasticity of labor supply.

All this is illustrated in the diagram 5

Diagram 5

## Monopsony Labor Market



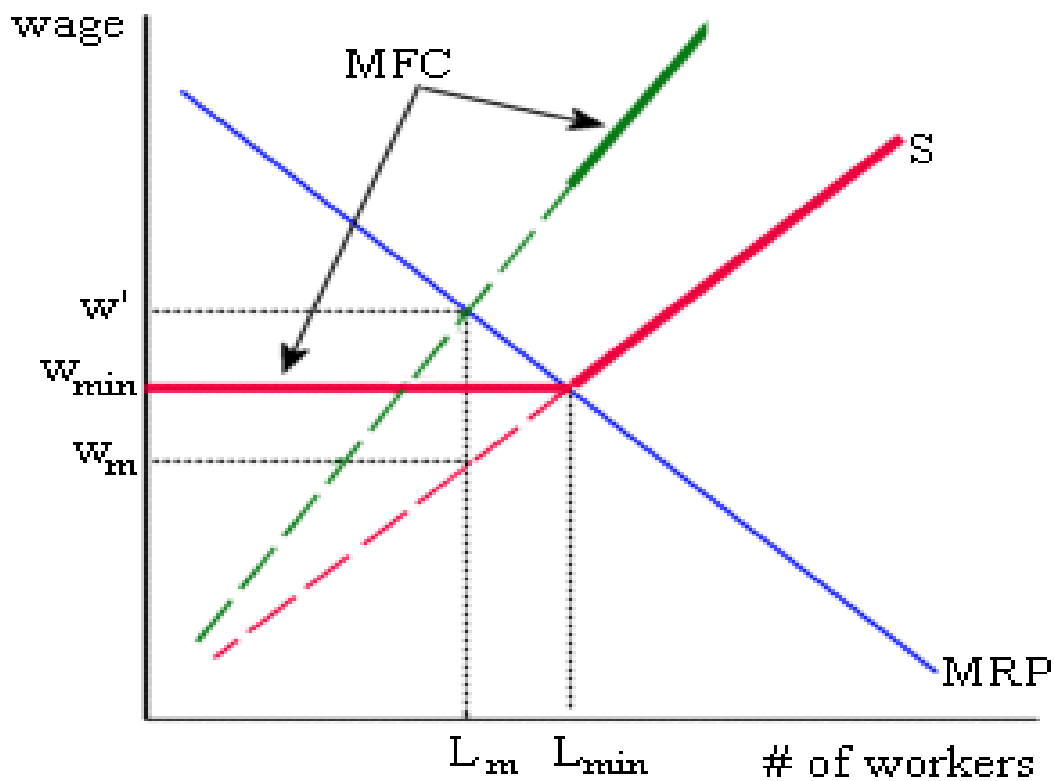
Mathematically speaking, the pure monopolist chooses the employment level that maximizes profits.

### 2.4.8 The introduction of minimum wage in monopsony labor market.

In case of introduction of minimum wage in a monopsony labor market, the labor supply became horizontal, the wage up to the point at which minimum wage intersects demand curve. This is illustrated in the diagram below (MRP)

Diagram 6

## Monopsony Labor Market





In the same way, because of monopolist pay less than marginal productivity of labor, the wage will be less in case of competitive labor market. Generally, we can say that the difference between two wages can be considered as a signal of the monopolistic power of the employees; it increases when the slope of labor supply increases and, in detail way, it decreases when the elasticity of labor supply respect to the wage.

In a monopsony labor market, then, a minimum wage fixed at intermediate level between monopsony and competitive equilibrium, led to an increase of both wages and employment. However, it is very important to underline as a wage higher than the one of the competitive labor market, could led to a level of employment that would be inferior to the level of competitive labor market. So, in the monopsony, we have a non-monotonic relationship between minimum wage and employment: for low levels of minimum wage, its increase led to an increase of employment, while after threshold we can observe the traditional negative relationship between minimum wage and employment. Some studies regarding the introduction of the minimum wage in a labor market have not been taken into consideration because it is not so easy to have a market where we have only an employee.

## **2.5 Is it possible to increase employment introducing a minimum wage in a monopsony labor market?**

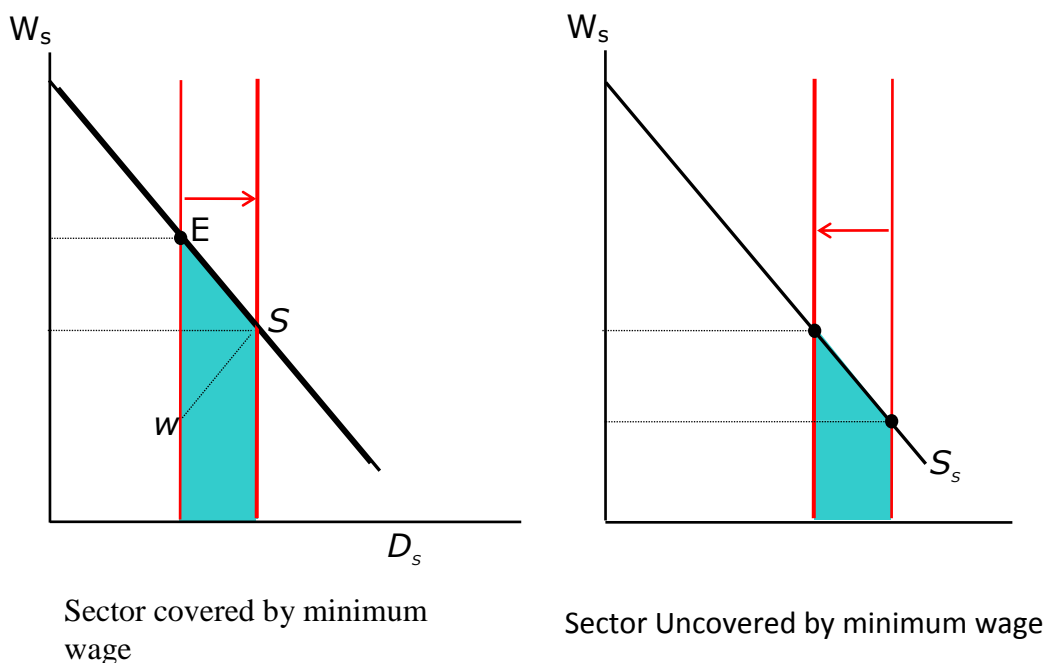
Several economists tried to give an answer to this debate question. The most influent part of them, affirm that it is possible only if the wage is not really high, and that the effort of the workers to finding a job is sensitive to the variation of wage.

## 2.5.1 Minimum wage in dual economy.

Minimum wage cannot have a negative effect on employment in a dual economy in which the minimum wage is not applied to the secondary or informal market.

However, in this case, we can have some negative effect that has been defined by economists as spillover effect. As affirmed by Garlic (1976), Mincer and Welch (1976), an increase of minimum wage in the covered sector, led some workers pass from the covered to uncovered sector; so as explained in the figure, if in the uncovered sector labor supply increase, it led to a decrease of wage. In this case minimum wage has the function to transfer workers from covered to uncovered sector generating a higher difference between the two wages. This is explained by diagram 6

Diagram 6



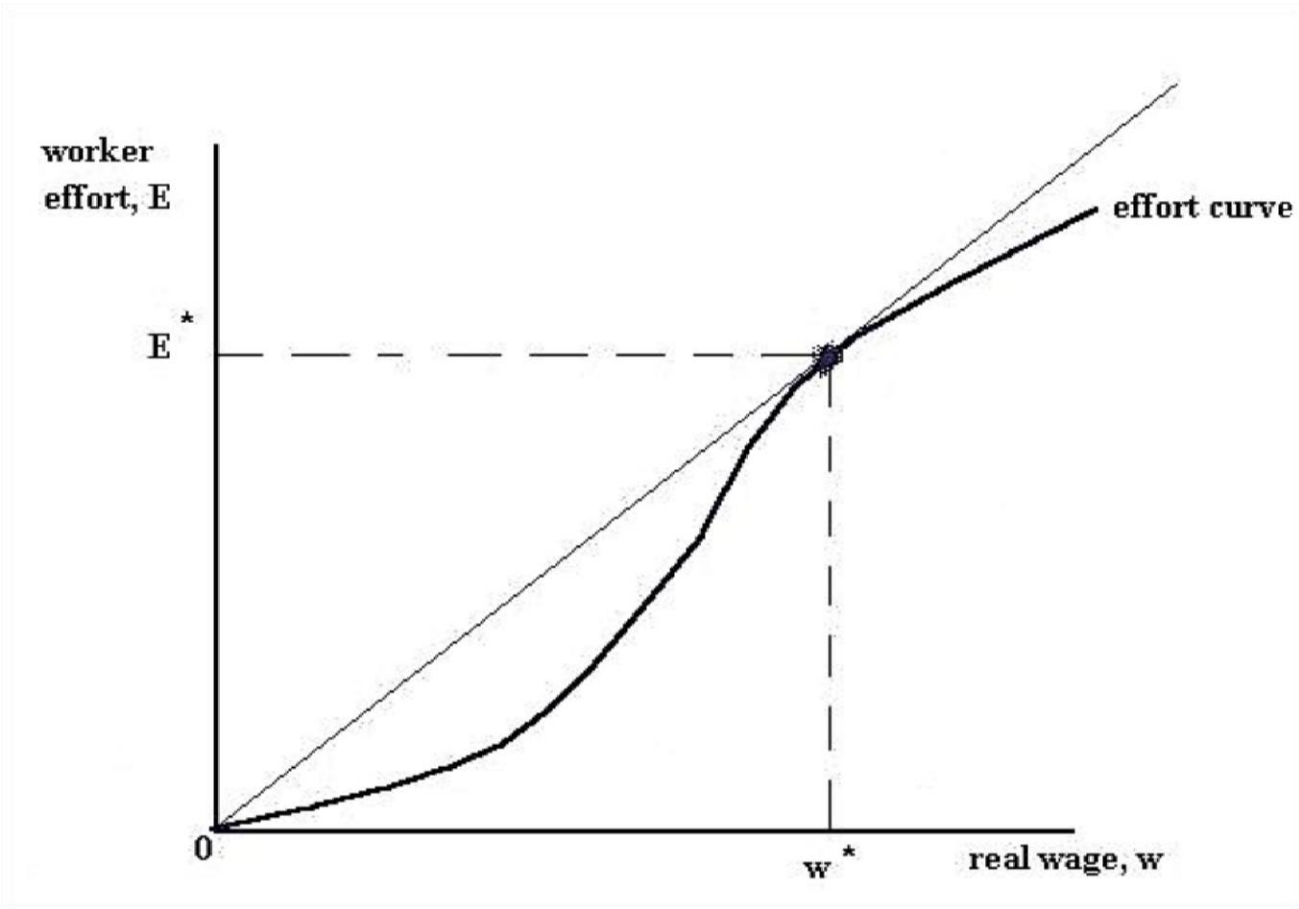
## 2.6 The efficiency wage model: the effort curve.

Efficiency wage model suggests firm to pay a wage major to that of full employment so the workers will be more productive. It implies less labor force turnover, less cost training and better motivated worker. So, for the efficiency wage model wage doesn't reduce wage because it would mean reduce productivity. All this is explained by the effort curve(diagram 5), based on idea that effort depends on the real wage that workers receive; if the wage is low, hardly the worker offers effort. So the effort increase only if the real wage increases<sup>20</sup> the curve flattens out because there is a part of effort which doesn't depend by the real wage. Firms will choose to pay the real wage that achieves the highest effort per dollar of wages. This is also called efficiency wage.

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<sup>20</sup> Real wage, by definition, is the wages adjusted for inflation.

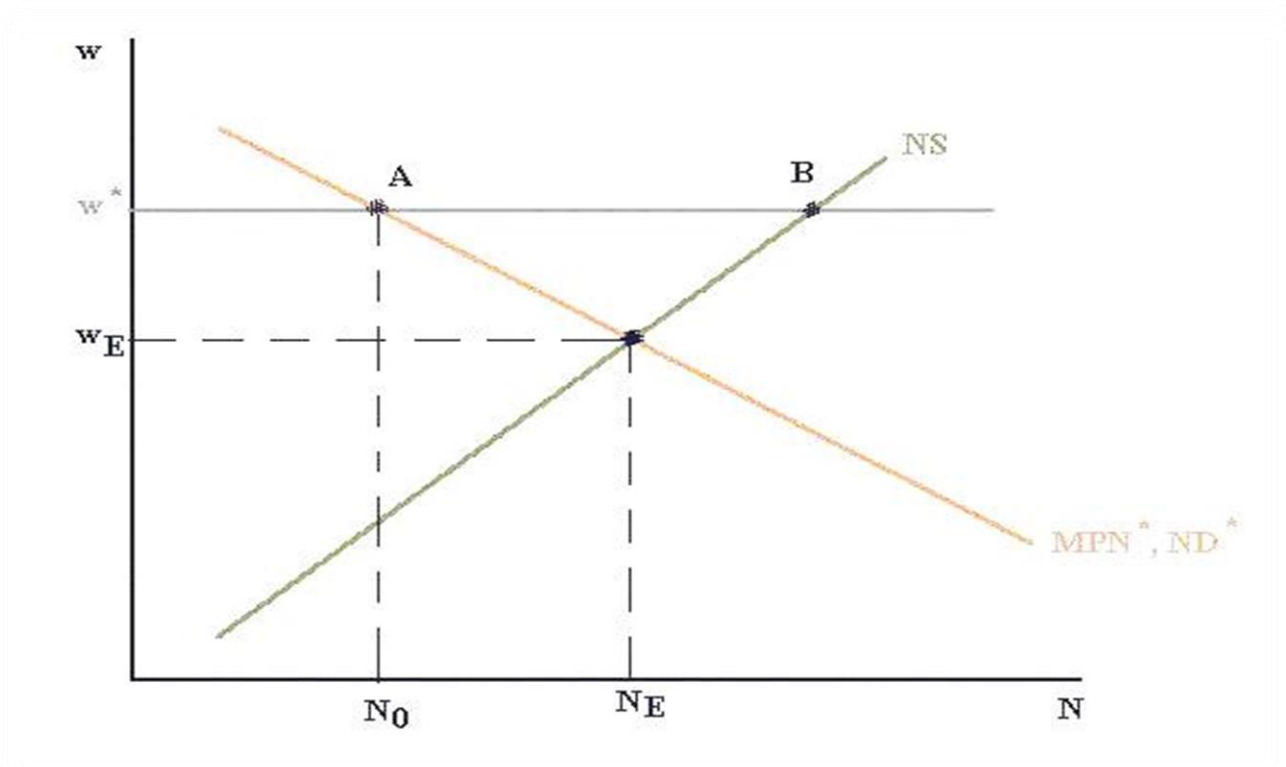
Diagram 7



### 2.6.1 The introduction of minimum wage in efficiency wage model: diagram and interpretation.

The following diagram shows what happens if we introduce a minimum wage (higher) in the efficiency wage model:

Diagram 8



As we can see workers working at  $w_E$  and will not put so much effort per dollar as worker receiving  $w^*$ . So if we take into account the efficiency-wage model employees pay a wage equal to  $w$  because workers will be more productive. But this model has some implications as, for example that employment only varies when  $MPN^*$  curve shifts and as we discussed before real wage is determined only by effort curve.

### **2.6.2 Heterogeneous labor model.**

Heterogeneous labor model instead is recently integrated into minimum wage analysis. Usually low wage groups are formed also by relatively skilled and better paid worker, often doing the same tasks and which are not affected by the minimum wage. That one are used as substitute of that worker directly affected by the minimum wages, causing a decline in overall employment but led to a wrong conclusion that the balance of overall unemployment effect of minimum wage may be very small.

### **2.6.3 Effort model.**

The last model is the effort one. It is a variant of the traditional model. The final conclusion of this model can be summarized in the following way:

-Initially a minimum wage reduces employment however it led to a competition among workers decreasing the low-rent marginal worker out of the market.

At the end all this erodes the rent conferred by the minimum wage to low-rent workers and increase the value of marginal product, so if the minimum wage led to more money income on low-skilled worker, it has little effect in rent to a worker, employment, total output and firm profits.

### **2.6.4 Should minimum wage be increased or decreased?**

The model on minimum wage which have realistic hypothesis (as for example the monopolistic power of firms) admit that the minimum wage fixing is an issue of fine-tuning: in fact, if it is fixed at a very low level, it loses its functions, but vice versa, if it is fixed at a very high level, we can have worst results of monopsony because total surplus would be less than its amount in the absence of minimum wage. Some studies tend to confirm that a decrease of minimum wage could give the opportunity to some less productive workers(as young and not-qualified workers) to get a job; this can be considered definitively true in economies with very high unemployment rate for some categories(as can be young people). On the other way, some economists tend to be agree with an increasing of the

minimum wage because of some group of workers tend to be less influent than other during collective agreements, increasing inequality. In this context, minimum wage has to be understood as an instrument to reduce poverty. Obviously, this theory has found very support in the part of population potentially and positively influenced by the increasing of minimum wage.

## **2.7 Economic literature about minimum wage.**

Economic literature on minimum wage is very vast; for example Newark and Washer (2004 and 2008) provide an in-depth review on the field, which continues to be characterized on how minimum wages affect employment in general and also for youth. Although early research on the topics consists of a mixture of a case studies and state panel estimation, recent research tends towards the latter, generally using time period fixed effect, geography-specific linear time trends, and geography-clustered standard errors. In addition, recent empirical specification includes covariates that capture non-linear difference and difference in local climates. For example Orrenius and Zavodny (2008) use a broad of a set of business cycle controls(in addition to dummy time-series) to account for differing economic environments across states and over time; then they find no adverse effect of the minimum wage on the employment, but above all for less-educated adult. Taking this step further, Allegretto and All (2011) demonstrate substantial heterogeneity in employment patterns across regions of the U.S and control for this by allowing time period effects to vary by Census Division; they find no effect on minimum wage on teenage and youth employment. There are also recent studies which have to view state-induced variation as suitable for identifying the employment effect of minimum wage laws (e.g. Pedace and Rohn, 2011; Sabia et al, 2012), but partly to facilitate credible identification , the type of data employed in minimum wage research has shifted <sup>21</sup>. Historically,

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<sup>21</sup> Using the within-state variation still averages change to the federal minimum wage: if the federal minimum wage floor increases, this effectively acts as a “negative” treatment to the wage differential between states that already use a super-federal minimum wage (and leave it unchanged) and those for whom the federal minimum binds. In my opinion Baskaya and Rubenstein (2011) use an interesting approach, due to the fact that they use a hybrid approach. They allow the

nearly every minimum wage analysis use individual-level (survey) micro data samples, but there are also recent research that use administrative data as the Quarterly Census of Employment and Wages (QCEW), provided by the Bureau Labor of Statistic. In addition, Addison et al (2009) use these data on the county-level population of retail employee and find little evidence of net employment effects. Also during county-level data in the QCEW, Dube et al 2010 compare contiguous counties across state lines and in the same way they find no effect from minimum wage differential. Then, of course, there are very recent studies which apply novel techniques to this question. For example, Sabia et al (2012) created a synthetic (in the sense of experiment) control for New York to study how the state's recent minimum wage increases affected low-wage teenagers and young; so estimating a large and significantly negative employment elasticity on minimum wage. A very important exception is the work made by Dube ET al (2011). In fact he examined the relationship between minimum wage and employee turnover using the Quarterly Workforce Indication (QWI), focusing on youth restaurant employee, and using a short panel of contiguous across state lines; found that the minimum wage reduced both new hiring and separations despite having little effect on employment levels. As mentioned above, the difference in features characteristics of "the national minimum wage research" is characterized by a shift away from a reliance on time-series variation in minimum wages towards the use of cross-sectional or panel data to identify the employment effects of minimum wage laws. This change was motivated by the fact that the using of time-series evidence on minimum wage effects give us important limitations, also because there have been relatively few legislated minimum wage changes. Another relatively advantages is that using cross-sectional or panel data to study the minimum wage effect it may provide potentially valuable information on how the minimum wages interact with other labor market policy (as we are will see to see after) that could be directly or indirectly associated with the minimum wage.

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variation of the minimum wage levels to determine the potential of each state of change to the federal minimum wage, and then instrument for these "minimum wage gap" in a structural model using a political ideology. Finally they find that minimum wage have significant net employment effect for youth and teenagers, but only when accounting for this variation across states.



### **2.7.1 Setting minimum wage.**

The economic and labor law suggests that employment effect depends also by economic and institutional context, the method of setting of the minimum wage and also by the role of labor market policies. In this case some recent studies regarding China from 2000 to 2005 found no overall effect on employment, with negative employment effect on only two regions. In the same way there are the same results also for Indonesia and Brazil. In more detail way, Suryahadi ET all also found that a 10 per cent increase of the minimum wage would reduce employment by 1.2 per cent. However, by the effect it is not so clear: in fact a very interesting and also recent study about Indonesia shows that a minimum wage increase was associated with a net increase in total (both formal and informal) employment<sup>22</sup>.

### **2.7.2 The Macroeconomic impact of the minimum wage.**

The overall macroeconomic impact of a minimum wage depends not only on how it effects consumption and investment, but also on how it affects competitiveness and whether it affects net export. If we consider the policy of increasing minimum wage which was actuated in such countries Latin America Economies, it led to an increase of consumption but also in investment and growth<sup>23</sup>. In some of these economies the minimum wage paid a key role in the creation of middle class which before was insistent, so creating a room for autonomous growth and enhancing social cohesion. All this means above all reduction of inequality, in the sense of redistribution of income to low-paid worker and then, power of consume and investment. In Indonesia, for example, minimum wage together with other polices led to an increase of equality at the bottom end of wage distribution; in

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<sup>22</sup> Comola and De Mello 2009

<sup>23</sup> ECLAC (Economic Commission for Latin America and Caribbean). 2012.

Brazil instead minimum wage increase led to a greater improvement for middle-income groups than for their low-income counterparts<sup>24</sup>.

### **2.7.3 The increasing of minimum wage and its impact on employment.**

The increasing of minimum wage can also influence average wages. If we take into account the evidence from Latin America, an increase of 10 per cent in minimum wage would led to an increase in average wage between 1 and 6 per cent (Cunningham, 2007). Unfortunately the greatest debate about the minimum wage is the relationship with employment. The most recent literature, in particular if we consider microeconomic studies, suggests that in most cases there is only small or no negative effect on employment. This is also confirmed by two recent studies: one if take into account all 64 studies about the impact of minimum wage in United States which confirmed or not the negative effect on employment, while some studies shows as the increase of minimum wage could reduce the unemployment of some categories of worker(low-skilled, and youth).

### **2.8 The empirical evidence about minimum wage: previous research.**

The empirical analysis on minimum wage is carry out mainly by few studies, the first one is that made by OECD (1998). It looks at the effect of the minimum wage on employment of teenagers, young adults and prime ages adults (age 25-54) for a small sample of countries, from 1975 to 1996. The countries are Belgium, Canada, France, Greece, Japan, the Netherlands, Portugal, Spain, and the United States. However, it is really important to evidence that for gender analysis the sample is reduced to seven countries because of the lack of adequate series of average wage for Portugal and Spain. The regression fellows the specification used in U.S.A. minimum wage literature; the dependent variable is the employment population ratio for youth, teenagers and young adults, while for 7 countries reduced specification, two sub-groups is used. The key minimum wage ratio has been

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<sup>24</sup> Empirical evidence are based on Chun and Khor (2010) for Indonesia and Lemos (2007 and 2009), from Brazil.

calculated using the ratio of the minimum wage to average wage, with controls for business cycle, different institutional features (not including LMI), using country and time fixed effect. The results are that minimum wage has a negative impact on teenager's employment for all type of specifications. In the authors preferred specifications with corrections for first-order autocorrelation for the error terms and heteroschedasticity across countries – a 10 percent increase in the minimum wage was associated with a fall in teenage employment of between 1.5 and 2 (2.7 and 4.1) percent. On the other hand, for young adults aged 20 to 24 years and for adult prime age males and females the elasticity was seldom statistically significant. However, OECD study doesn't consider labor market institutions (as union density, for example); but it has been done in a pioneer study by Lazear (1990). The study by Neumark and Wascher (2004) is very important in this sense because it links minimum wage and labor market institutions literature. Specifically, they estimated the effect of the minimum wage on teenage and young people using again the employment-population ratio for seventeen OECD countries covering the period (1976-2000). In addition to the countries of OECD study, it includes also Italy, Australia, Germany, Denmark, Sweden, Luxembourg, New Zealand, and the United Kingdom. The dependent variable is the employment-population ratio for the group concerned the ratio of minimum wage to average wage. Their basic equation regress the employment measure on a one year-lag of the minimum-to average wage ratio plus aggregate labor market and demographic control. In all cases, the estimated wage elasticity is between -0.13 and -0.28 for young adults and from -0.09 to -0.31 in the case of teenagers.

The authors include estimation also for labor market institutions, focusing mainly on union density indicator. Again focusing on the preferred results of GMM estimations, author founds evince of certain complementarities.

Bassanini and Duval (2006), also study minimum wage but considering its relationship with unemployment not employment; like the formal approach, they consider the ratio of gross statutory minimum wage to median or average wage. Obviously, they also take into consideration Neumark and Washer (2004 and 2009)<sup>25</sup>, affirming that a few papers combine information on both statutory and contractual minimum wage. However, contractual minimum wage can vary across sector and often depend on worker's age, experience and qualifications; and it is more likely to be quite different

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<sup>25</sup> Bassanini and Duval Paper titled: The Determinants of Unemployment across OECD Countries: Reassessing the role of policies and institution, *OECD Economic Studies No. 42, 2006*, page 21.

from those of uniform national minimum wage. For these reasons, being agree with Bassanini, Duval and the main thrust of literature, considering that these data are first hardly available and secondly to be summarized in a one cross country comparable indicator, collective bargaining minima are excluded from the scope of this analysis.

Another thing to consider is that nearly all the empirical studies on minimum wage have focused as legal minimum wage floor affect the employment level, either for all but also for a restrict type of people(as for example, young and teenagers). For example, in a Diamond (1981), the type worker and matching framework, an effect on minimum wage should be more transparent in employment dynamics. The basic intuition is that while in the short-run the minimum wage effect positively employment, it may be act on the job creation margin to alter the long-run rate of bet job growth. For sure there are several papers on minimum wage, and above all time series model early 1980 was the predominant model. Brown (1999) built a model about the U.S, taking into account a minimum wage imposed at both high and low wage, and he finds a negative and significant effect. However, before 1980 we had a number of more recent cross-section and panel data in Canada and In the U.S, so a different type of approach (Grenier and Sèguin, 1991 for Canada). All these studies seem to suggest that the effect of the increase of the minimum wage of the 1980s and 1990s doesn't seem to be negative, and in some cases, can be positive. This type of estimation is more similar to the earlier specification, but the difference that we take into account more years together, the clear message is that including additional year it reduces the estimated effect of the minimum wage on employment. In addition, some authors as Kenan talked on the issue that time series led to a problem due to omitted variables and other time series relative problem, so panel data was at time the best method of estimation. However, in recent years there have been several studies which were trying to underline as OLS time series was robust and so the best way to estimate So, on balance, these new reading, if accepted, would reintegrate the standard text book prediction of the negative effect of the minimum wage in employment for youth.

### **2.8.1 A new method of estimation: “quasi natural experiment”.**

However, we have to considered that recent studies consider a new method of estimation for the impact of the minimum wage on employment in general, and then also for young people. Baker, Benjamin and Stranger (1999) had advantage of the unique experiment afforded by the Canadian data relative to the U.S, with the aim to estimate the minimum wage effect based on 1973-1995 sample period. However, they estimate only for teenagers and didn't disaggregate for gender. They found a negative significant minimum wage effect elasticity (-0.25) driven by the low-frequency variation data. They affirmed that the dependence of the elasticity to low frequency is that the employment dynamics in the minimum wage sectors are not well described by short-run adjustment costs, but by explanations that focus on turnover and firms. Another study, so called natural o “quasi-natural experiment”, has found insignificant or positive effect, as well as the shortcoming or unsuitability of any such methodology.

## **2.9. Active labor market polices. (ALMP'S)**

In the last years there has been a growing interest about the issue of active labor market policy. First off all there are several interpretations of the active labor market policy; the most used and accepted is the following: “measures in order to improve the functioning of the labor market that are directed towards unemployed”. So the primary aim of the labor market is to comprise three basic subcategories: job broking with the purpose of making the matching process between vacancies and job seekers more efficient, labor market training and in order to upgrade and adapt the skills of job applicants, and direct job creation, which can be done by either public sector employment or subsidization of private-sector work. However, we have to take into account that each type of policy can be studied using several different channels, so in this case will be more useful to build a simple analytic framework in way to understand the crucial determinants of the policy effectiveness.

### **2.9.1 ALMP'S in the history.**

In several countries ALMP have a long tradition. At the end of XX century employment office was opened, and between the two world wars, some programs were actuated to help unemployed. A series of different active labor market program and policies were adopted for youth. These included: direct employment generation (wage subsidies, public works, guaranteed job schemes), employment service with the aim to facilitate young people's transition into the labor market, and skill developed program. Primary, we can say that generally we have two types of policies: one regard to promote employment, through training, subsidies and work placement; another regards that one which can help young people to become self-employed. When we talk about job growth we have to take into account which it doesn't come from labor market interventions alone, but also by macroeconomic and fiscal policies which should support employment generation through global growth. Growth policies encouraging economic diversification and productive transformation through sectorial strategies, removing constraints regard private investment above all for small firms. Labor standard and social protection for young people can be implemented above all through the quality of jobs; there are several young worker which works long hours, in bad condition and not able to go out of

their status of poverty. In this case, wage policies can be very important for both economic and right reasons. All this has to be linked to the fact that several young workers have inadequate social protection, also because they worked in non-standard conditions for an employment. So there is a need to improve and expand social protection programs for young people, with the perspective that these social measures have to be understood as investment not as a cost for society. ALMPs also include activation, measures that provide incentives for the unemployed to increase job finding either directly through benefits sanctions or through mandatory participation in training. Key examples of activation programs are requirements that unemployed individuals attend intensive interviews with employment counselors, apply for job vacancies and apply for jobs. ALMP policies may eliminate mismatches in the labor market, promote more active search behavior on the part of jobseekers, and have a screening function because they substitute for regular work experience for reducing uncertainty about the employability of job applicants.

### **2.9.2 ALMP'S economic theory.**

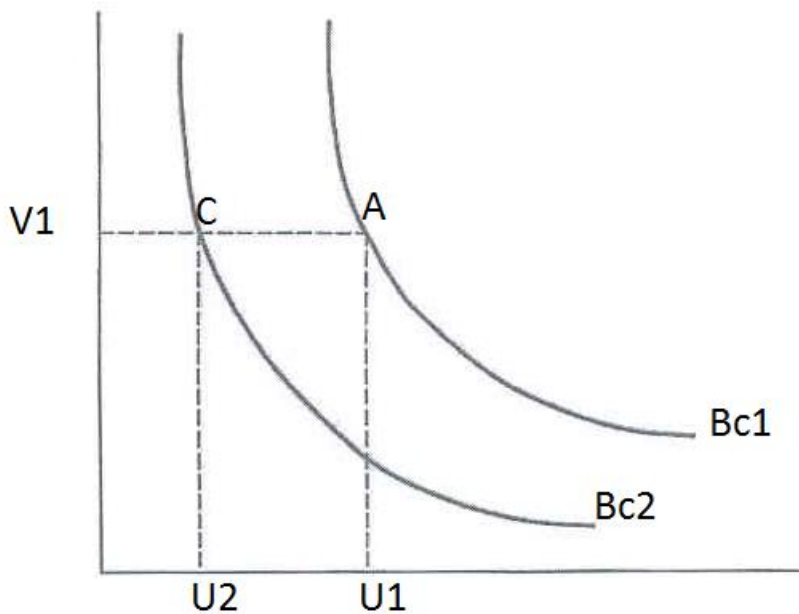
In macroeconomics the first analysis of labor market programs has been done using the Layard-Nickel Model. As we can see from the figure the downward-sloping curve is an employment schedule relating employment<sup>26</sup> measured as a proportion of the labor force to real wage. The upward-sloping curve instead is wage setting-schedule, where we can see that higher aggregate employment causes pressure for higher real wages. In this case some relationship can be derived; in particular monopoly union, efficiency wage and bargaining models. Some researchers believe that unions can lead to wage increases and so causing layoffs, another part believes that employers have to pay more to compete for their work forces in some situations.

One very useful way to explain the measures of the effectiveness of the matching process between vacancies and unemployed can be done taking into account the Beveridge Curve.

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<sup>26</sup> Assuming to be equal to labor demand

Diagram 9



Bc1 curve is slopes downward because in a boom there are many vacancy and few unemployed, while in slump there are many unemployed and few vacancies. Due to the economy cyclical fluctuation, the unemployed-vacancy combination moves up Bc1 curve. In a given period could be that we have a rate of vacancy equal to  $V1$  and a rate of Unemployed equal to  $U1$ . The exact location of Beverage curve depends as the labor market efficient is. ALMPs may improve the efficiency of the labor market, causing an inward shift of Beverage Curve, for example from  $U1$  to  $U2$ . In this case, given the same vacancy rate  $V1$ , we have an unemployment rate equal to  $U2$ . Boone e van Ours (2004) built theoretical model about search-matching in which we have there ALMPs: training of unemployed workers, employment incentives and employment public service .The key idea is that the workers of public offices help unemployed worker to apply for the best training course for everyone,



in way to optimize the number of hours dedicated to the training and above economic resources. In this model the employment offices have the key role to filter the vacancies in way which the work seeker take into account only the relevant work for him/her; then they have the key role to reduce the search for the workers. In this model, ALMPS have two ways to reduce unemployment. Firstly, they can improve the probability to find a vacancy. Second, through training, they can improve not only unemployed but also employed to find better jobs in term of wages. They argument that training can effectively improve the employability of the workers, while incentives and employment offices can be less efficient; they also affirmed that with a higher unemployment benefits can led to a more efficient training course and then, more probability to became employed.<sup>27</sup> Boone and Van Ours (2006) built a model about the role paid by the sanctions on the performance; a measure to improve the probability of work seeks which have unemployment benefits to find a job. They show as the sanctions can influence the period of unemployment in two ways: ex ante and ex post. Ex ante because more rigid requirement to apply for benefits increase the intensity of job search also for not sanctioned worker, ex post because decreasing unemployment benefits provided, increase the intensity of job search by a sanctioned worker. However, to analyze active labor market policy, we have to modify a little bit the both models; because we have to distinguish between participation in labor market programs and regular employment. For this reason, employment and wage-setting schedules are instead drawn with regular employment (excluding participation programmers). So, in that way, the interaction between the employment and wage setting schedules at a now determines the rate of regular employment. Also Beverage curve has to be modify, in way that horizontal axis measures the total number of job searcher without a regular job, while the vertical axis indicates vacancies for regular job. The "New Beverage Curve" can be very useful to explain the various effects of the labor market program. If for example we have an increase of placement in training or job creation schemes and nothing else happen, the effect would simply be to reduce open unemployment by a corresponding amount. Now we have to underline the role of regular employment, in particular how it is affect by the increase of placement in training. The idea is to capture how long the strong is the gross impact on open unemployment, because it could be also reinforced or counteracted by the indirect effect. However, we have to underline how we can have different effect of active labor market policies that can be considered as interactive each other, in

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<sup>27</sup> Similar result is express by Bassanini and Duval (2006).

particular: -effects on labor force participation, -effect on job matching –effects on the competition in the labor market, -substitution effect, work test effects, - productivity effect. General equilibrium tax effect and repercussions on other policies.

### **2.9.3 Policies and institutions: Does a link exist?**

Before moving to analyse empirically data, in this section I am going to present a recent literature about these issues. In general:

-1) “there are popular positions on the effectiveness of active labor market programs. On one hand, proponents of these programs argue that active labor market programs are necessary and useful, short only of a panacea for reducing unemployment and protecting workers. Opponents of the programs tend to summarily dismiss these programs as a waste of public money with high opportunity costs to other social programs and labor market efficiency as a whole.”(Dar and Tzanattos, 1999).

2) However, there is a need to underline as regarding the effects of alternative policies, Bassanini and Duval (2006, page 6), argue that...

“Change in policies and institutions appear to explain almost two thirds of not cyclical unemployment change over the past two decades. ...On average, it is estimated that a 10 percentage point reduction in tax wedge, a 10 percentage point reduction of unemployment benefits and/or decline in product market regulation by two standard deviations would be associated with a drop of unemployment rate by about 2.8, 1.2 and 0.7 percentage points, respectively.”;

-3) on active labor market programs, Bectherman, Olivas and Dart (2004, p. 52) observe that “some ALMPS do have a positive impact (on unemployment), with favourable cost-benefits ratio. However, in many cases, programs have not improved the future employment effect prospects and participants and, when they have not always done in so in cost-effective manner. ..Employment service is generally the most cost-effective intervention and compared to other ALMP’s are inexpensive. Training programs for the unemployed can also have positive impact on employment. These programs are most effective when they are workplace based.”

-4) Regarding EPL “most of the individual county studies demonstrate that regulations promoting job security...or net reduce employment” (Heckman and Pagès, 2003 p.6).

Finally, taking into consideration the most recent literature on policy effectiveness, we can affirm that:

-ALMP'S should have a positive impact/effect on labor market outcomes (employment rates);

-Regulations that either enhance the rigidity of labor market, or that generally are likely to shift downwards the firm's demand for labour, are expected to have a negative on labor market outcomes.<sup>28</sup>

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<sup>28</sup> Rovelli and Bruno (2008); “Labor Market Policies , Institutions and Employment rates in the EU-27”

## **2.10 Theoretical model and econometric specification.**

The theoretical model takes into account can be considered as implicit; it is in the spirit of Cahuc and Zylberberg (1999) and Coe and Snower (1997). The first offers a dynamic search and matching model with negotiation and employment protection, and introduce minimum wage setting into this framework to study its impact on job creation and job destruction. Their model shows that employment protection may strongly elevate unemployment of lower skilled workers when the minimum wage is high. Cover and Snowier develop a model of policy complementarities and show that policy/institutions that affect bargaining power of incumbent employees, or that influence barriers of job creation have complementary effects on unemployment such that minimum-wage like measures that cost jobs can be magnified or ameliorated according to the restrictiveness of the ruling labor market environment.

The aim of both models is to capture of minimum wages and labor force characteristics, and imply that minima will be less disruptive when policies are less rigid.

Regarding the econometric specification and the choice of variables, as explained before, we take into consideration Bassanini and Duval (2006), which consider itself Neumark and Washer (2004) as basic theory.

## 2.10.1 Main results.

Baseline regression results are represented in the following table:

**Table 1**

**Dependent variables: Youth Employment rate**

Variables	Fe without gap	Fe including gap	Gmm without. gap	Gmm including Gap
L1year			0.60** (0.27)	0.38** (0.19)
Epl	4.24** (1.85)	2.41 (1.56)	-1.24 (1.53)	-2.37 (1.78)
Union Density	-0.71*** (0.22)	-0.73** (0.37)	-0.03*** (0.01)	-0.03*** (0.01)
Minimum wages	-5.89* (3.46)	-8.96* (5.27)	-4.79** (2.40)	-6.38** (3.75)
Pes	0.23*** (0.08)	0.2*** (0.05)	0.11** (0.05)	0.03*** (0.01)
Training	-0.3 (0.3)	0.2** (0.1)	0.10*** (0.03)	0.17*** (0.05)
Youth measures	-0.33 (0.29)	-0.08 (0.27)	-0.30 (0.27)	-0.18 (0.3)
Employment Incentives	0.04** (0.02)	0.05* (0.03)	0.02** (0.01)	0.06** (0.03)
Measures for Disables	-0.04** (0.02)	-0.06** (0.03)	-0.22*** (0.05)	-0.41** (0.16)
Tax wedge	-0.13** (0.06)	-0.2** (0.11)	-0.04** (0.02)	-1.35*** (0.38)
Coordination	0.5 (2.10)	0.4 (2.10)	0.41 (1.75)	0.79 (1.95)
Youth as % of working age population	-0.61** (0.30)	-0.30** (0.14)	-0.91** (0.42)	-0.95** (0.45)
Dual apprenticeship	5.40** (2.55)	6.10** (2.74)	15.20** (7.10)	12.20** (6.10)
Output Gap		0.20** (0.10)		0.12** (0.05)
Cons	52.22	66.76	19.42	55.68
R squared(within)	0.80	0.85		
Country effect	Yes	Yes		
Times Effect	Yes	Yes		

Hansen test(pvalue)			1.00	1.00
N of instruments			60	57
Arellano-Bond AR1test			-2.30**	-2.45**
Arellano-Bond AR2test			-0.25	-0.32
N of observations	476	476	476	476

\* , \*\* , \*\*\* , statistically significant at 10%, 5% and 1% levels, respectively

Standard errors are in parenthesis, for panel data model It has to be considered as clustered standard-error.

As we can see, panel data with both countries-times fixed effect and GMM dynamic panel data model have been estimated. Furthermore, following Bassanini and Duval (2006), the same specification has been estimated two times, one including output gap variable and one without one. Starting from panel data with fixed effects, we can affirm that R square within (which indicates the variability explain by the model has a very high significance (0.80 and 0.85 for both specifications, so it indicates that the model has been specified in good way.

Analysing results for the first column (fixed effect without including gap) we can see as several variables have statically significance; in detailed way, an unitary increase of EPL increase youth employment rate by 4.24 point percentage(with five percentage statically significance). As expected, union density and minimum wage indicators have a negative and significance impact on youth employment rate (decreasing it respectively by 0.71 and 5.89 points percentage).

A negative effect is also estimate for tax wedge (-0.13 in youth employment rate); however there is a need to take into consideration that the measure of tax wedge is derived from OECD tax model and therefore only captures labor taxes (social security contributions and labor taxes), but not consumption taxes<sup>29</sup> ; furthermore also youth percentage as working age population led to an

<sup>29</sup> The source is the OECD Taxing Wage Database (See Bassanini and Duval, Annex 2), which defines it as the wedge between labor cost to the employer and the corresponding net take-home pay of the employee for a single-earner couple

decrease of youth employment rate by (0.61 point percentage). However, a very important role in this model has paid by ALMP'S variables. Dummy variable for apprenticeship system is positive and also significant (at five per cent; it means that the presence of the apprenticeship system is a valid instrument to increase youth employment rate (5, 40 points percentage). Several additionally ALMP'S variables have significance: Employment incentives(holding constant other variables) led to an increase of youth employment rate by 0.04 point percentage; a stronger effect is given by public employment services, which led to an increase of youth employment rate by 0.24 with a five per cent of statistically significance. Also the variable which measures active labor polices for disables is statistically significant at 5 per cent, so it implies that an increase (in percentage) of measures for disability led to a decrease of youth employment rate by 0.04 points percentage. The second column, including also output gap, shows the same results( considering statistically significance); furthermore we have to consider that also the additional variable has statistically significance( at 5 per cent); meaning an increase of youth employment rate by 0.20 points percentage. Considering other variables, we can say that: dual apprenticeship dummy continues to have a positive impact/effect on youth employment rate (6.10 points percentage); the same is for minimum wages and for other ALMP'S indicators. The only variable which loses statistically significance is EPL one, also if it is always positive. On the other hand, training variable becomes statistically significance at 5 per cent, so as expected, an increase of one point percentage in training variable led to an increase of youth employment rate by 0.20 points percentage. To sum up, in the second column the variables maintain the same significance and sign of the first one, but, additionally, also output variable has statistically significance, and considering that R square is also improved, we can say that it can be considered preferred to the first one because it better specifies/ explains the model.

Third and fourth columns represent generalized method moments for dynamic panel data (GMM). As explained before, Bassanini and Duval didn't use this type of econometrics specification in their paper<sup>30</sup>; it is very useful technique because GMM estimators are known to be consistent, asymptotically normal and efficient in the class of estimators that don't use extra information aside from that contained in the moment conditions.

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with two children earning 100% of APW earnings. The tax wedge expresses the sum of personal income tax and social security contributions as a percentage of total labor cost.

<sup>30</sup> Or at least for this specification.

The advantages of GMM estimators are that:

- 1) it doesn't require hypothesis on the distribution of the observations,
- 2) it admits heteroscedasticity (form unknown);
- 3) it permits to estimate parameters also if the model cannot be analytically resolved starting of first order condition.

In this model, a very important role is paid by Hansen test and by Autocorrelation test (AR1 and AR2). Technically speaking, it has been estimated using `xtandond2` command offered by STATA 12 Software; it is a very useful command because it permits, regarding instruments, the limits of lags which have to be included. If `t` id fairly large (more than 7-8, so this is the case), an unrestricted set of lags will introduce a huge number of instruments, with a possible loss of efficiency. So, in this case a lag limit options has been included; specifying that only lags 2-5 have to be used in constructing Gmm system. Furthermore, following previous literature, minimum wage has been considered as endogenous. As we can see, this model tends to confirm previous results (and then literature): in both specifications union density as a negative impact on youth employment rate (also if the effect is less strong than panel data model); minimum wage continues to have a strong, strong and statistically significance impact on dependent variable (with same strong; 4.79 in the specification without gap and 6.38 including it), the lagged dependent variable is also significant at five per cent. Considering both estimates (without and with gap), a strong result is given by dual apprenticeship dummy. In the first model, its presence implies an increase of youth employment rate by 15, 20 per cent, while in the second one, it led an increase by 12, 20 points percentage (it is a very strong result considering that panel data with both fixed effect has given a positive and statistically significant but not including this intensity). A difference can be seen also considering the estimates including gap for tax wedge variable. Also if it has been also statistically significant and with negative sign in all previous estimates, however, as dual apprenticeship dummy, in the last it effect is become stronger. However, we cannot really understand the fit of model if we don't evaluate the test expressed before: Jansen test and Autocorrelation/s test.

Starting from Jansen Test, firstly it requires that the number of moment conditions be greater than the number of parameters in the model, its aim is to verify the null hypothesis of over-identification(



it has a chi-squared distribution). Accepting the null hypothesis of over-identification as we have to do in both estimates), we can conclude that the model (as instrumental variable use), has been specified in good way. Now next step is to evaluate Autocorrelation-test(s), the number 1 and 2 indicate the first difference errors at first and second order.

When the heteroskedasticity errors are independently and identically distributed (i.i.d), the first-differenced errors are first-order serially correlated. So, as expected, the output for both model present strong evidence against the null hypothesis of zero autocorrelation in the first-differenced errors at an order 1. Serial correlation in the first-differenced errors at an order higher than 1 implies that the moment's conditions used is not valid. However, in our case, both models present no significance evidence against serial correlation in the first-differenced errors at order 2.

## **2.11 Interactions between policies and institutions.**

In a standard wage setting/price setting (WS PS) model<sup>31</sup> has been showed that institutions interact with each other in their impact on aggregate employment/unemployment. Such interactions can be summarized in two mechanisms:

-First, policies and institutions that can affect wage and/or elasticity of demand (bargaining power, EPL, the tax wedge), interact between policies and institutions (as for example unemployment benefits).

-Second, the marginal impact on labor demand of a given change in real wages is likely to larger when employment rate is already high than it is low.

The overall explanation that emerges from theoretical explanations is that virtually all possible interactions between policies and institutions can influence employment rate and that also if such interactions imply reform complementarities should be assessed on the basis of empirical evidence. In this case, the choice has been to estimate more common interactions previously estimate in literature; as the interaction between employment protection legislation and minimum wage, and coordination and minimum wage. So, the next step is to estimate these interactions to better understand their role/effect and impact on employment (youth) rate.

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<sup>31</sup> Layard et al 1991, Nickell and Nunziata, 1999

**Table 2**

**Dependent Variable: Youth Employment Rate including also interactions between policies and institutions**

Variables	Fe without gap	Fe including gap	Gmm without. gap	Gym including Gap
L1year			0.62**	0.42**
			(0.29)	(0.21)
Epl	4.31**	7.53***	-1.30	-2.60
	(2.20)	(1.01)	(1.70)	(1.90)
Union Density	-0.71***	-0.35*	-0.03***	-0.03***
	(0.22)	(0.20)	(0.01)	(0.01)
Minimum wages	-5.27	-8.96*	-6.51**	-8.82**
	(3.10)	(5.70)	(3.10)	4.20
Pes	0.14***	0.17***	0.15**	0.03***
	(0.05)	(0.05)	(0.07)	(0.01)
Training	-0.3	0.2**	0.10***	0.17***
	(0.3)	(0.1)	(0.03)	(0.05)
Youth measures	-0.33	-0.10	-0.35	-0.18
	(0.29)	(0.27)	(0.40)	(0.3)
Employment Incentives	0.04**	0.05*	0.02**	0.10**
	(0.02)	(0.03)	(0.01)	0.05
Measures for Disables	-0.04**	-0.06**	0.5***	-0.41**
	(0.02)	(0.03)	(0.09)	(0.16)
Tax wedge	-0.22**	-0.2**	-0.10**	1.01**
	(0.10)	(0.11)	(0.05)	(0.45)
Coordination	0.7	0.4	0.41	0.70
	(2.50)	(2.10)	(1.75)	(2.50)
Youth as % of working age population	1.21**	-0.30**	-1.11**	-0.95**
	(0.50)	(0.14)	(0.50)	(0.45)
Dual apprenticeship	5.40**	6.10**	17.34**	15.54**
	(2.55)	(2.74)	(8.10)	(7.03)
Output Gap		0.20**		0.12**
		(0.10)		(0.05)
Epl* Minimum wage	-6.30**	-6.51**	-8.61**	-9.76**
	(2.93)	(3.10)	(4.10)	(4.54)
coord*Minimum wage	2.20	2.60	-4.50	-4.60
	(1.90)	(1.80)	(3.24)	(3.35)
Cons	60.03	66.76	19.42	25.65
R sward(within)	0.82	0.87		
Country effect	Yes	Yes		

Times Effect	Yes	Yes		
Hansen test(pvalue)			1	1
N of instruments			60	57
Arellano-Bond AR1test			-2.40**	-2.51
Arellano-Bond AR2test			-0.34	-0.40
N of observations	476	476	476	476

\* , \*\* , \*\*\* , statistically significant at 10%, 5% and 1% levels, respectively

Standard errors are in parenthesis, for panel data model It has to be considered as clustered standard-error.

As we can see, after including interactions, the number of variables significant is the same (without considering the level). Also signs remain the same for all variables, so it means that model has been correctly specified. So, comments will concentrate on the evidence given by interactions variables. In this sense, there is a need to underline as only minimum wage\*epl interaction variable is significant. This means that a unitary increase of this variables, led a decrease of youth employment rate from 6.30 to 9.76 points percentage.

## **2.12 Estimates for young male and female.**

After estimating for youth, the next step has been to estimate the same regression model (including also interactions) considering separately male and female groups. The aim has been to understand if trying to control for gender we have different estimations/results.

The following table regard male, and we have these results:

**Table 3**

**Dependent Variable: Youth (Male) Employment Rate.**

Variables	Fe without gap	Fe including gap	Gmm without. gap	Gym including Gap
L1year			0.96***	0.90***
			(0.05)	(0.06)
Epl	9.09***	11.55*	3.88*	5.70**
	(4.23)	(6.23)	(2.10)	(2.46)
Union Density	-0.81***	-0.77**	-0.10**	-0.10**
	(0.25)	(0.39)	(0.04)	(0.04)
Minimum wages	-5.94**	-6.37**	-7.73*	-9.35**
	(2.97)	(3.25)	4.25	4.60
Pes	0.10**	0.15**	0.15**	0.12*
	(0.05)	(0.07)	(0.07)	(0.07)
Training	-0.28	-0.34	0.06**	0.04**
	(0.5)	(0.3)	(0.03)	0.02
Youth measures	-0.31	0.45	0.75	0.90
	(0.50)	(0.61)	(0.80)	(0.85)
Employment Incentives	0.19**	0.19**	0.10**	0.10**
	(0.09)	(0.09)	(0.04)	(0.04)
Measures for Disables	-0.28***	-0.13**	-0.15***	-0.20*
	(0.08)	0.06	(0.05)	(0.11)
Tax wedge	-0.69*	-0.68*	-0.28*	-0.35***
	(0.38)	(0.37)	(0.16)	(0.10)
Coordination	0.8	0.8	1.84*	2.27**
	(2.50)	(2.50)	(1.07)	(1.18)
Youth as % of working age population	-1.61**	-1.61**	-0.49*	-0.69
	(0.75)	(0.75)	(0.26)	(0.39)
Dual apprenticeship	19.09*	21.87*	29.16*	29.7*
	(10.61)	(12.15)	(16.20)	(16.52)
Output Gap		0.20**		0.36*
		(0.10)		(0.20)
Epl* Minimum wage	-7.58**	-8.39**	-7.70*	8.00*
	(3.61)	(3.80)	4.28	4.40
coord*Minimum wage	5.05	5.21	-3.66*	-3.66**
	(3.32)	(3.30)	(1.69)	(1.69)
Cons	22.65	52.65	17.82	20.14

R squared(within)	0.76	0.80		
Country effect	Yes	Yes		
Times Effect	Yes	Yes		
Hansen test(pvalue)			1	1
N of instruments			60	57
Arellano-Bond AR1test			-2.10**	-2.35**
Arellano-Bond AR2test			-0.10	0.12
N of observations	476	476	476	476

\* , \*\* , \*\*\* , statistically significant at 10%, 5% and 1% levels, respectively

Standard errors are in parenthesis, for panel data model It has to be considered as clustered standard-error.

A general consideration is that changing the dependent variable (youth male for youth) the results don't change.

However, there is a need to underline that we can have also cases with better results: it is the case of EPL which is always positive for all models considered including all type of specifications (from 3.88 to 11.55 per cent, also if with different level of significance). A very positive result is given by "coordination" variable because it is always positive but(considering GMM model), it has also statistically significant(at five per cent); it means that unitary (percentage) increase of coordination led to an increase of youth employment rate(for male) respectively by 1.84 and 2.27 points percentage . Union density also in this estimates is always negative and significant (as expected and obtained in previous estimates), considering a range from 0.10 to 0.81; the same is also for minimum

wage also if in this case additionally we have always at least 10 per cent of statistical significance. The range of minimum wage estimates (from 5.34 to 9.35) is the same of previous estimates. Considering ALMP'S, also in this case estimates seem to confirm previous ones; "youth measure" variable is not significant, while employment incentives is always significant (at five per cent of significance level), with a range from 0.19 to 0.10. Dual apprenticeship system would seem to lose statistical significance, but however results are still good; additionally the value for all four estimates is very high (while in the previous ones it happens only considering GMM model); so it would mean that dual apprenticeship system could increase employment rate for young male by 19.9-29.7 points percentages. Now we can start to analyse what interactions estimates suggest: a preliminary comment is that also in this estimates the  $epl * \text{minimum wage}$  variable interaction is significant (at five or ten points percentage); it means that a unitary increase (in percentage) of this variable led to an decrease of male youth employment rate by 7.58-8.00 points percentage; the other interaction variable doesn't have statistical significance (as it was for previous estimates). The last step now is to understand if the model continues to have a good specification: for panel data with country fixed effect,  $r^2$  percentage is good; so it means that the model is still specified in a good way; regarding the GMM model, Hansen test and Arellano Bond test (1-2) for autocorrelation, seem to confirm that the GMM model has been specified in a good way. As explained before, also for this case the model has been built taking into consideration which minimum wage variable has been considered as instrumental variables.

Next step now is to understand if for female we have different results; the following table give us these results:

**Table 4**

**Dependent Variable: Female Youth Employment rate.**

Variables	Fe without gap	Fe including gap	Gmm without. gap	Gmm Including Gap
L1year			0.90*** (0.06)	0.90*** (0.06)
Epl	7.00** (3.22)	12.68** (5.25)	1.36* (0.81)	2.68* (1.49)
Union Density	-0.64*** (0.19)	-0.81** (0.38)	-0.08*** (0.02)	-0.10*** (0.03)
Minimum wages	-9.11* (5.02)	-9.63** (4.50)	-10.92** 5.20	-10.23** (5.01)
Pes	0.10** (0.05)	0.14** 0.07	0.07* (0.04)	0.08** (0.04)
Training	0.06** (0.03)	0.06** (0.03)	0.04** (0.02)	0.04** (0.02)
Youth measures	0.80 (0.65)	0.70 (0.60)	0.75 (0.45)	0.90 (0.70)
Employment Incentives	0.02 (0.08)	(0.22)** (0.10)	0.09* (0.05)	0.10** (0.05)
Measures for Disables	-0.11 (0.11)	-0.63 (0.64)	-0.15*** (0.03)	-0.15*** (0.03)
Tax wedge	-0.51* (0.28)	-0.61* (0.34)	-0.23 (0.70)	-0.21** (0.10)
Coordination	0.75 (2.64)	0.75 (2.64)	1.84* (1.07)	1.84* (1.07)
Youth as % of working age population	-4.30* (2.39)	-6.06* (3.10)	-0.49* (0.26)	-0.49** (0.23)
Dual apprenticeship	15.48* (8.60)	18.41* (10.23)	26.27* (14.20)	21.87* (12.10)
Output Gap		0.45** (0.20)		0.30** (0.14)
Epl* Minimum wage	4.29 (5.23)	-9.9* (5.50)	-1.25 (4.50)	-9.39* (5.22)



coord*Minimum wage	5.15	5.20	-0.48	-2.47
	(3.40)	(3.50)	(0.91)	(1.74)
Cons	7.08	10.25	15.37	7.08
R sward(within)	0.70	0.75		
Country effect	Yes	Yes		
Times Effect	Yes	Yes		
Hansen test(pvalue)			1	1
N of instruments			60	57
Arellano-Bond AR1test			-2.01**	-2.15**
Arellano-Bond AR2test			-0.90	-0.95
N of observations	476	476	476	476

\* , \*\* , \*\*\* , statistically significant at 10%, 5% and 1% levels, respectively

Standard errors are in parenthesis, for panel data model It has to be considered as clustered standard-error.

The following results would seem to confirm the theory\_which female (also youth) really have much more difficulties than man to get a job. This has been immediately confirmed analysing values of dual apprenticeship variables: it clearly confirmed which the presence of dual apprenticeship system of course increase female youth employment rate, but less than male one. The same can be understood if we analyse minimum wage variable; in this case a unitary increase of this variable leads to a decrease of youth employment rate for female more than man. It happens also if we consider EPL variable, its unitary increase led to an increase of female youth employment rate which is less than male one (it is confirmed in 3 estimates of 4). The same information is given by youth cohort; a unitary increase led to a decrease of female youth employment rate by 6.06-0.49 point's percentages. Considering other variables, the general idea is that the significant ones continue to have statistical meaning, however training becomes significant for all four estimates(while for male it was only for

two), and coordination as for male confirms its statistical significance. The same consideration has to be done also for interacted variables: as previous estimates, only the one regarding EPL and minimum wage has statistical significance, while the other one confirms that it doesn't have statistical meaning. The last step now is to analyse the value of two model: for panel data r square confirm that the variability explained by the model is enough to consider it specified in good way; regarding the GMM model the tests to analyse are always the same (Hansen Test and Arellano Bond Test); also in this case they suggest the model is specified in good way. (Respectively 1 in both cases for Hansen Test, -2.01 and -2.15 for AR1, -0.90 and -0.95 for AR2).

## **2.13 Conclusion.**

This chapter was born with the aim to analyze youth employment issue. The first questions which I asked myself were: What influence youth employment rate? Why is youth employment rate so critical? Answering this questions, at the same time I was writing this chapter. There are mainly three components which influence youth employment rate: minimum wage, labor market policies and institutions. Several papers have been written about these ones, however, not all included interactions between them. Result differs in base of econometric assumptions considered. My choice (according with my supervisor) has been to investigate these topics considering OECD countries, using a panel method of estimation but including also a dynamic one: the results tend to confirm previous ones based on panel data method considering minimum wage increase as negative instrument for youth employment. Considering labor market institutions, their impact depends by which one we consider: union density confirms its negative impact on youth employment rate, while on the other hand EPL variable using OECD definition confirms its positive effect on youth employment. ALMP'S have a great influence on youth employment rate, several variables are positive and significant, while other variable included in the model only in part confirms previous literature.

The last part of the second chapter ends with a little discussion about gender discrimination in the issue of youth employment too. As results show, also if the sign of the variable is always the same (confirming both literature and the goodness of the model), however the magnitude tends to be stronger (in negative meaning), for female estimates.

## **Chapter 3 : Estimating the impact of minimum wage on youth employment elasticity: a meta-analysis of data including publication bias.**

In last decades economic field has been characterized by an expansion of research publication and an increasing of information and literature review linked. Some researchers started to analyze mountains of paper with the aim to find research with contradictory results. Using a particular statistical technique, called meta-analysis, we will able to have an estimation regarding the real “effect”, so contributing to clarify the issue in the literature. This is a crucial point also regarding the impact of the minimum wage on youth employment elasticity; so in this way we will able to give a very important contribute regarding this very debated topic/issue.

### **3.1 Meta-Analysis.**

Meta-analysis is a statistical combination of several and independent studies. This is defined as a way to make the best use of all information we have from a systematic or narrative review. Instead of the usual practice to analyzing observations of individual workers/paper, with meta-analysis each paper represents an individual point. Alternative definition of Meta-analysis considers it as a body of statistical methods that have been found so useful in reviewing and evaluating empirical research results. There are several advantages to Using meta-analysis; one of these is that it implies a meta-study narrative/systematic review that allows often a qualitative assessment of the literature in the same way as an “econometrician would write a survey”. All different approaches can be taking into consideration: all methodological features of a particular and original analysis can be used as control variables in the Meta regression analysis; this is a crucial point because the regression coefficient gives a quantitative measure of the importance of the concerned research method.

### 3.1.1 Systematic vs. narrative review approach.

A systematic (review) can be defined as a review that is conducted according to clearly stated, scientific research methods, and it is designed to minimize biases and errors inherent to traditional, narrative reviews.”<sup>32</sup>. It is an investigation to develop theory, establishing evidence and solving problem. Reviewing evidence, and synthesizing findings, is very common during our ordinary lives. For example, when we decide to buy a car, the first question is: Which car shall I buy? However, we have to take into consideration the fact that this question implies other ones as: What cars are available? What type of car do I need? Which car will make me happy? All this means gather data in way to take the best solution. Some people do it for us, so we buy car magazine, read online reviews, but we also talk to people we know, visit car showrooms and take some cars out for a test drive. So, in this way, we are critically reviewing the evidence we have gathered (including our personal experience) and identify possible reason for doubting the veracity of individual claims. We may give priority to such characteristics, such as reliability or boot space, etc. This is only one of several examples for understanding what it means do a systematic review. Starting our product research by relying first on what other people have written gives us access to a wide range of ideas about how to judge cars. Our “decision question” drives what we are doing (Which car shall I Buy?)And the other entire question has the aim to give an answer to this question. Narrative review instead can be defined as an “evidence-round ups” on a specific topic, but it doesn’t necessarily follow systematic evidence-based criteria. Narrative reviews often do not meet important criteria to help mitigation bias, in several cases it lacks explicit criteria for article a selection and frequently there is no evaluation of selected articles for validity; there is a high potential for low methodological quality. However, narrative reviews can be useful for summarizing the literature and providing guidance, but as explained before it has not been considered to draw conclusion on the effect.

Then, to sum up, systematic review seeks to clearly formulated question (Which car shall I buy?) by using rigorous, explicit protocols to identify, select and appraise relevant research studies, and to collect and analyze data from the selected studies. To minimize bias, systematic includes or excludes evidence on the basis on explicit criteria, while narrative review may be evidence based, but it is not

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<sup>32</sup> Margalio, Zvi, Kevin C. Chung. Systematic Reviews: A Primer for Plastic Surgery Research. PRS Journal. 120/7 (2007).

based on research. It usually lacks systematic search protocols or explicit criteria for selecting and appraising evidence. Differences between systematic and narrative review are several. The first one is that systematic one investigates a clearly defined topic or question, while narrative review intends to provide an overview of an area. Another difference is that systematic literature is gathered using explicit search protocols while narrative doesn't work in this way; furthermore in systematic review studies are selected using a protocol that specifies inclusion and exclusion criteria, while in narrative it doesn't happen. The last difference is that when in systematic review evidence is lacking, the authors usually recommend further research; while in narrative review make recommendation based on their opinion and experience. Recommendations may be "graded" based on the consistency and strength of the underlying evidence.

So, for all explained before, systematic review is favorite and more useful to the aims of meta-analysis.

### **3.2 Aim of Meta-Analysis.**

The aim of statistical combination is to improve the precision of our estimates. The decision about which results to include in meta-analysis is a focal point influencing also the validity of the result.

#### **3.2.1 Meta-analysis as part of research process.**

The role of Meta-Analysis is to synthesize the available evidence for a given question. But Meta-Analysis, as Systematic Review, can be also part of the research process. This point was underline by Ian Chalmers (2007)<sup>33</sup> that affirmed as the meta-analysis is also useful to design the study. In fact it may also show that in prior studies one outcome index is more sensitive than other, and should be used in the planning study as well.

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<sup>33</sup> In an article titled: "The lethal consequences of failing to make use of all relevant evidence about the effect of medical treatment: the need for systematic review.

### 3.3 Meta-analysis use: theory and practice.

Considering last two decades, there have been hundreds of Meta-analyses studies in the field of medical and social sciences, always considering area with controversy results. Many examples regard clinical trial of the new drugs and medical treatments. Furthermore, it has been defined as the most efficient user of experimental data; for example for several times streptokinase has long been investigated as a potential treatment of heart attacks for its disability to dissolve blood clots. For two decades, randomized trial were undertaken without any clear recommendation, until three meta-analysis were published, and “Although the results of the individual clinical trials had been contradictory and unreliable, all three meta-analysis found that when the trials were combined, they showed that the clot-dissolving agents almost certainly reduced the risk of death by a considerable margin<sup>34</sup>”.

#### 3.3.1 Debate on its use.

Some medical, as some economist, initially didn't use meta-analysis, due to the mixing of that can be consider as “good” or “bad”. But, with the pass of the time, and above with the encouragement of the American Statistical Association, it becomes so widespread, also if initially only for small studies. Its diffusion was due to the clarification role had in some controversial area of research, as for example in establish a connection between exposure to TV violence and aggressive behavior<sup>35</sup>, the risk of second smoke and the effectiveness of spending more money on school. Considering economics field, some example of meta-analysis regarding union wage premium (Jarrel and Stanley), Minimum wage effect (Card and Kruger), and gender wage gap (Stanley and Jar ell).

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<sup>34</sup> Hunt,1997, page 86)

<sup>35</sup> Paik and Comstock, 1994

### 3.4 Meta-analysis: procedures and methods in previous analyses.

Meta-analyses in economics have to be cope with several problems that depend by the increasing and the nature of data used in econometric analysis, reporting method used by academic researchers and journal. But, as explained before, it is not the only problem that we could have: a potential biases is possible due by the selection and publication in primary studies <sup>36</sup> . All these problems include heteroskedasticity, heterogeneity, outliers, dependence of estimates, and publication bias. Card and Krueger (1995) were the first to use a Meta -analysis for wage studies. In particular, in this paper was presented a Meta -analysis of the published time series literature. The basic assumptions was that there were some studies (mainly the last one in that period), that were be able to collect more observations that early ones. They collect relatively few studies (15, and 12 were selected). The first result that they find was that t ratios reported in different studies were negatively correlated with the underlined sample sizes. In addition, the estimated employment effect tended to be about twice its standard error, regardless of the size of the standard error. They concluded that time series literature may have been affected by a combination of specification searching and publication bias, leading to a tendency for statistically significant results to be overrepresented in published literature. They used a Meta regression model in which log of t ratio for each studies were the dependent variable, while explanatory variables were log of square root of degree of freedom, dummy for auto regression correction, sub-sample for teenagers and logarithmic specification. However, the key independent variable was the log of the square of the degree of freedom, which was predicted to have a coefficient equal to 1 by sampling theory. In 2010 Bookmann provides a meta-analysis of 55 empirical studies estimating the employment effect of minimum wage in 15 industrial countries. The paper strongly confirmed that the notion of the minimum wages is heterogeneous between countries. As possible sources of heterogeneity it considered the benefit replacement ratio, employment protection and the collective bargaining system. He concluded that while the results were in line with theoretical explanations, the degree to which they were robust differed across these

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<sup>36</sup> Nelson and Kennedy, 2009; Stanley and Doucouliagos, 2012).



institutions. This study followed the influence by Card and Krueger, the central theme underlined was that the effects of particular regulations as for example mandatory of minimum wages were likely to depend on a country's wider institutional setting, as well as on norms, macroeconomic conditions and other circumstances. Most of the studies in that paper used either regression techniques or quasi experimental difference in differences (DID) method; all using micro and aggregate data. Regarding the empirical model, he used a probit ordered model for meta-analysis. An important group on independent variables was which ones related to labor market regulation in the country for which the study was conducted; they were constant for countries and year and relate to the late 1990s, corresponding to the average wage of the observation period of the studies included in the analysis. Being a probit order model, the dependent variable was a code, divided in four arbitrary categories (significantly negative 5% level, insignificantly negative, insignificantly positive, significantly positive 5%). The three institutional variables included to capture interactions with other regulations have influenced the estimated employment effect of the minimum wage in plausible ways. At the end he concluded that while estimated effects appear plausible, their robustness is not beyond doubt. It was due by the fact that the number of studies available at the moment didn't permit more detailed analysis. Another most important meta-analysis on Minimum wage Research was conducted by Doucoliagos and Stanley (2009). Their work was so much discussed because they affirmed that Card and Krueger confused publication selection with the absence of genuine empirical effect. Furthermore, they affirmed that minimum wage effect literature was contaminated by publication selection bias; in their opinion, once this publication bias has been corrected, little or no evidence of a negative association between minimum wage and employment remained. The key research questions were also if new method of meta-analysis could find publication selection and whether meaningful minimum wage employment affects remains after likely publication selection, it is filtered from this research literature. However, the funnel plot was so difficult to analyze/interpret because there were so few estimates. Regarding meta-analysis estimation, they estimated using the Card and Krueger's model, affirming that when all studies are selected for statistical significance, publication selection bias will be proportional to the standard error. Their conclusion were that, no evidence of genuine adverse employment effect can be found among time-series estimates of minimum wage elasticity used by Card and Krueger, but they contained a clear indication of publication selection. Their results find strong evidence of publication selection for significantly negative employment

elasticity but no evidence of a meaningful adverse employment effect when selection effects were filtered from research record. For them, two scenarios were consistent with this empirical research method: first simply that minimum wage may don't have effect on employment. If this affirmation would be true, it would mean that the conventional neoclassic labor model is not adequate with U.S Labor Market (especially for teenagers). Secondly, they affirmed that labor minimum wage might exist, but is could be very small; but considering 64 studies and 1500 estimates, they "have reason to believe that if there is some adverse employment effect from minimum-wage raises, it must be of a small and policy- irrelevant magnitude<sup>37</sup>"

### **3.5 Present meta-analysis: procedures and methods.**

First of all, the first step of this meta-analysis has been to select paper which focused their attention on the role/impact of minimum wage on employment (elasticity). The research has been done using internet web sites "Google scholar" and repec typing words "minimum wage" and youth employment (elasticity)

Paper selected after this step was 250; after there was a need to read all articles in way to understand which ones analyzed also youth employment elasticity. It has been decided to looking for employment elasticity and not for youth employment one because in several cases we can have different estimations for the same paper, so it would be possible to find youth estimations also in that one which not clearly included them.

#### **3.5.1 Data collection.**

It represents the second step of my meta-analysis. It, together with systematic review, is a crucial step also because a lot of studies founded in my research, are not so useful for meta-analysis because they included also other outcomes potentially influence by minimum wage, such as labor earnings, the wage distribution. Dataset consists in all econometric selected studies. A minimum requirement for inclusion is that employment effect was econometric estimated. Following previous literature/paper,

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<sup>37</sup> Publication Selection Bias in Minimum Wage Research? A meta-regression Analysis. Doucouliagos and Stanley, June 2009.

and also due by their lower power, data resulting by panel data estimates has not been included. An important data to take into consideration is the country where the studies has been conducted, also because it will be important to include as independent variables some labor market institution indicators for each relatively country in meta regression. This work has been done from January to May 2014; the selected papers were 35(only regarding young people), with 161 estimates on youth employment elasticity on minimum wage.

This table shows a summary of data selected.

**Table 5**

Summary of meta-analysis variables

Specification	Resulta
Number of estimates	161
Publication date (median)	2000
Elasticity (mean)	-0.325
Standard errorr (mean)	0.14
Number of countries	4

**3.6 Publication bias.**

Publication bias can be defined as the bias in the result of a review due to some research studies being more likely to be published<sup>38</sup>, and thus identified in a review search, than others. The key issue is that it is systematic; if the chance of publication was random, with no consistent impact on result than it would be less critical. Publication bias has been identified empirically relatively recently through systematic review activity; however it is not a new issue. In fact in 1975, Antony Greenwald carried out an empirical investigation regarding some causes of publication bias. In his paper, titled

<sup>38</sup> Gouch, Oliver and Thomas (2012): An Introduction to systematic review.

“Consequence of prejudice against the null hypothesis”, he considered all the different points in the research process that a systematic bias in favor of positive result might originate. He demonstrated that researchers are more likely to investigate problem that confirm their personal viewpoints, that they are more likely to publish positive findings, and that editors are more likely to publish to accept paper that report positive findings.

So, publication bias means that “even” exhaustive searchers are less likely to find negative and non-statistically significant findings, and that systematic review affect by publication bias are likely to overestimate positive results. Following Doucouliagos and Stanley Model, we use the most common method (but not only this one) to detect publication selection that is funnel plot. The name funnel plot is based on the precision in the estimation of the underlying “treatment effect” or “effect size” as the sample size of the component studies increases.

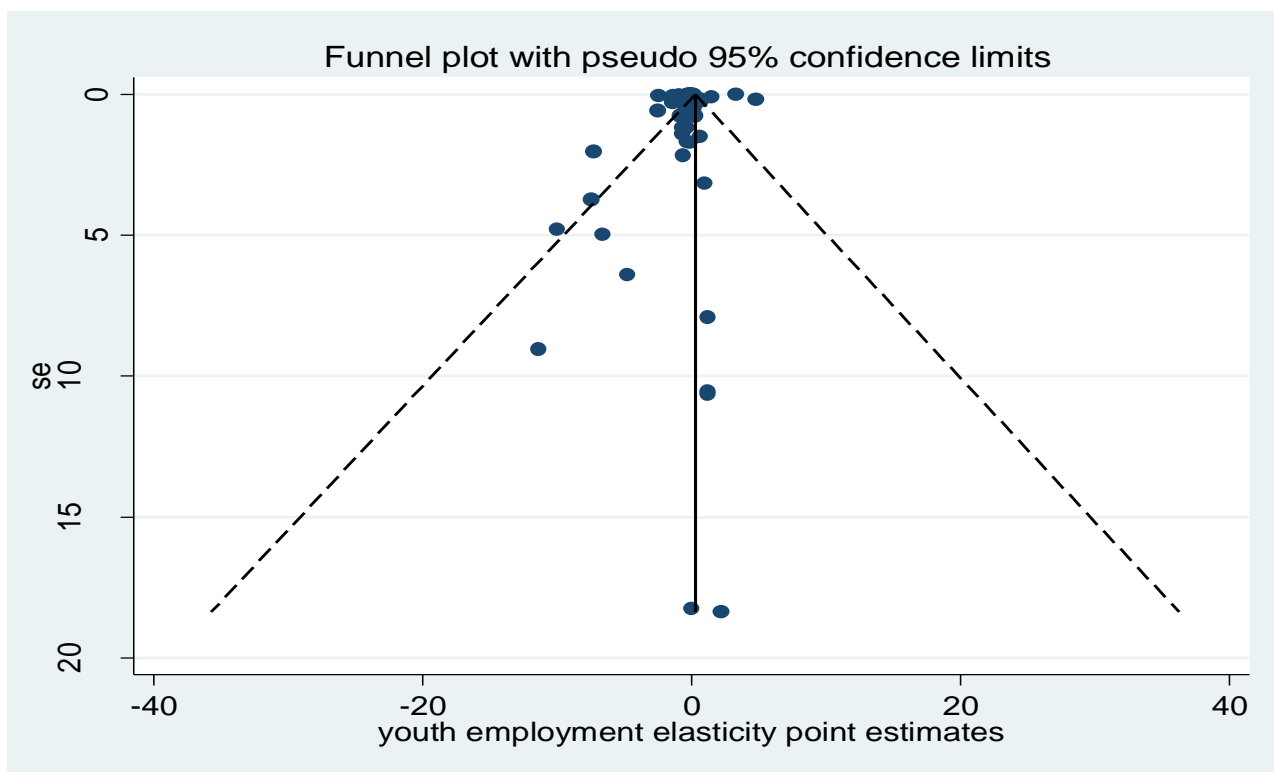


Figure 4

Funnel plot of 161 youth employment elasticity estimates

Its aim is to analyze publication bias, the association of publication probability with the statistical significance of study results.

Funnel plots, plots of the studies' effect estimates on the horizontal axis against sample size in ascending order on the vertical axis, is very useful to assess the validity of meta-analyses. It is common to plot effect estimates on the horizontal axis and the measure of the study size on vertical axis. The name funnel plot "arises" from the fact that precision of the estimated intervention effect increases as the size of the study increases. For the purposes of displaying the center of the plot in absence of bias, calculation of the summary estimates using fixed effect rather than random effect is preferable because the random effects estimate given greater relative weight to smaller studies and, will therefore, be more affected if publication bias is present<sup>39</sup>. Interpretation of funnel plots is facilitated by inclusion of diagonal lines representing the 95% confidence limits around the summary estimates, i.e. [summary effect estimate  $- (1.96 \times \text{standard error})$ ] and [summary effect estimate  $+ (1.96 \times \text{standard error})$ ] for each standard on the vertical axis. This show the expected distribution of studies in the absence of heterogeneity or of selection bias: in absence of heterogeneity, 95% of the studies should line within the funnel plot defined by these straight lines. Because these lines are not strict 95% limit, they are referred to as "pseudo 95% confidence limits".

### **3.6.1 Asymmetry as explanation of publication bias.**

Asymmetry is one of the possible explanations of bias. The more pronounced the asymmetry, the more likely is that the amount of bias will be substantial. In this funnel plot, we can see that there is not so much asymmetry. However, we have to consider that publication bias is only one of a number of a possible explanation for funnel plot asymmetry. For example, trial of lower quality yield exaggerated estimates of treatment effect<sup>40</sup>. Smaller studies are, on average, conducted and

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<sup>39</sup> Poole and Greenland, 1999.

<sup>40</sup> Schulz ET all 1995.

analyzed with less methodological rigor than larger studies<sup>41</sup>, so asymmetry may also result from the overestimation of treatment effect in smaller studies of lower methodological quality.

### **3.6.2 Reasons of funnel plot asymmetry.**

In detailed way, Egger at all in 1997 listed a possible different reason for which we can have funnel plot asymmetry as:

1. Selection bias (publication bias, location bias, languages bias, multiple publication bias);
- 2 True heterogeneity (Size of effect differs according to study size: Intensity of intervention, Differences in underlying risk);
- 3 Data Irregularities (Poor methodological design of small studies, inadequate analysis, Fraud);
- 4 Artifact (Heterogeneity due poor choice of effect measure)
- 5 Chances.

In addition, other possible biases affecting the selection of studies for inclusion in meta analyses include the propensity of the results affect the frequency with which a study is cited and, hence, its probability of inclusion in meta-analysis, and the multiple publication of studies with demonstrating an effect on intervention<sup>42</sup>.

### **3.7 Contour- enhanced funnel plot.**

There is evidence that, generally, the primary driver for the suppression of studies is the level of statistical significance of study results, with studies that do not attain perceived milestones of statistical significance( i.e.  $p < 0.05$  or  $0.01$ ) being less likely to be published<sup>43</sup>. Despite this, there has

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<sup>41</sup> Egger at all 2003

<sup>42</sup> Tramer at all, 1997.

<sup>43</sup> Easterbrook ET all 1991; Dickersin 1997; Ioannidis 1998).

not been method previously considered to identify the areas of the funnel plot that correspond to different level of statistical significance, to assess whether any observed asymmetry is likely caused by publication bias. On a contour-enhanced funnel plot is a funnel plot with contours of statistical significance in way to facilitate the assessment of whether the areas where studies exist are areas of statistical significance and whether the areas where studies are potentially missing correspond to areas of low statistical significance. If studies appear to be missing in area of low statistical significance, then it is possible that the asymmetry is due by publication bias. Conversely, if the areas where studies are perceived to be missing are areas of high statistical significance, then publication bias is a less likely cause of the funnel asymmetry.

All this explained before is represented by the following graphs:

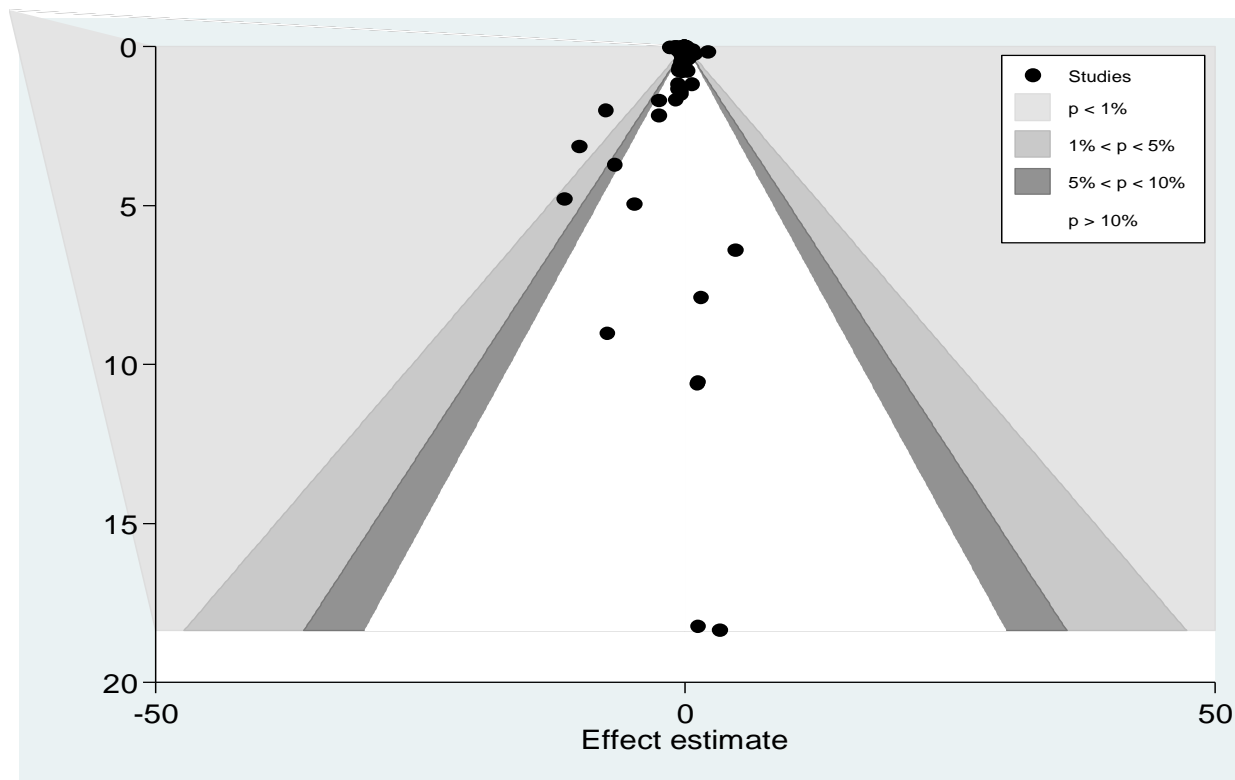


Figure 5

### Contour- enhanced funnel plot

When the standard error is used on y axis of a funnel plot, it is conventional to reverse the axis so that the most precise studies are displayed at the top of the plot. As we can see, several studies are put on the highest part, so it means that all studies have a very good precision. Furthermore, comparing the figures, we have to take into consideration the fact that they are elaborated with two different commands in Stata: the first one with metafunnel command, the second with confunnel one. As it is easy to understand, they are very similar; the only difference is that in the second figure we have the addition of the contours of statistical significance. In this way it is easier to assess the proportion of studies published in the meta-analysis at and around statistical significance. In both figure there is a suggestion of not asymmetry. However, the area where missing studies are perceived includes regions of both low and high statistical significance (i.e. area crosses over the contours), suggesting studies that showed magnesium to be not significantly and significantly less effective to be missing. Therefore, publication bias cannot be accepted as the only cause of funnel



asymmetry if it is believed studies are being suppressed because of mechanism based on two-sided p-values.

However, it is important to emphasize the difference between the pseudo 95% confidence limits produced by metafunnel command in the figure 4 and the contours of statistical significance produced by metafunnel in the figure 5(Peter et al 2008). The pseudo 95% confidence limits illustrate the expected 95% confidence interval about the pooled fixed-effects estimate for the Meta analysis. The pseudo-confidence limits therefore help to assess the extent of between-study heterogeneity in the meta-analysis and the asymmetry on the funnel plot. Unlike the pseudo-confidence limits, the contours of statistical significance are independent of the pooled estimate; therefore, if the pooled estimate is subject to bias, then the contours of significance will not be affected.

### 3.7.1 Analyzing missing studies on one sided significance test.

If there could be evidence showing that some studies could be suppressed considering one side (instead of two sides) significance test, this can be verified using the Stata Command confunnel(with one side option). Unlike the standard version, in this case the area where studies are perceived is with the region of low statistical significance. Under this assumption, it is more reasonable to consider publication as the potential cause of funnel asymmetry. In this context, the one-sided assumption implies that studies showing magnesium to be harmful are likely to be suppressed regardless of the significance of the results.

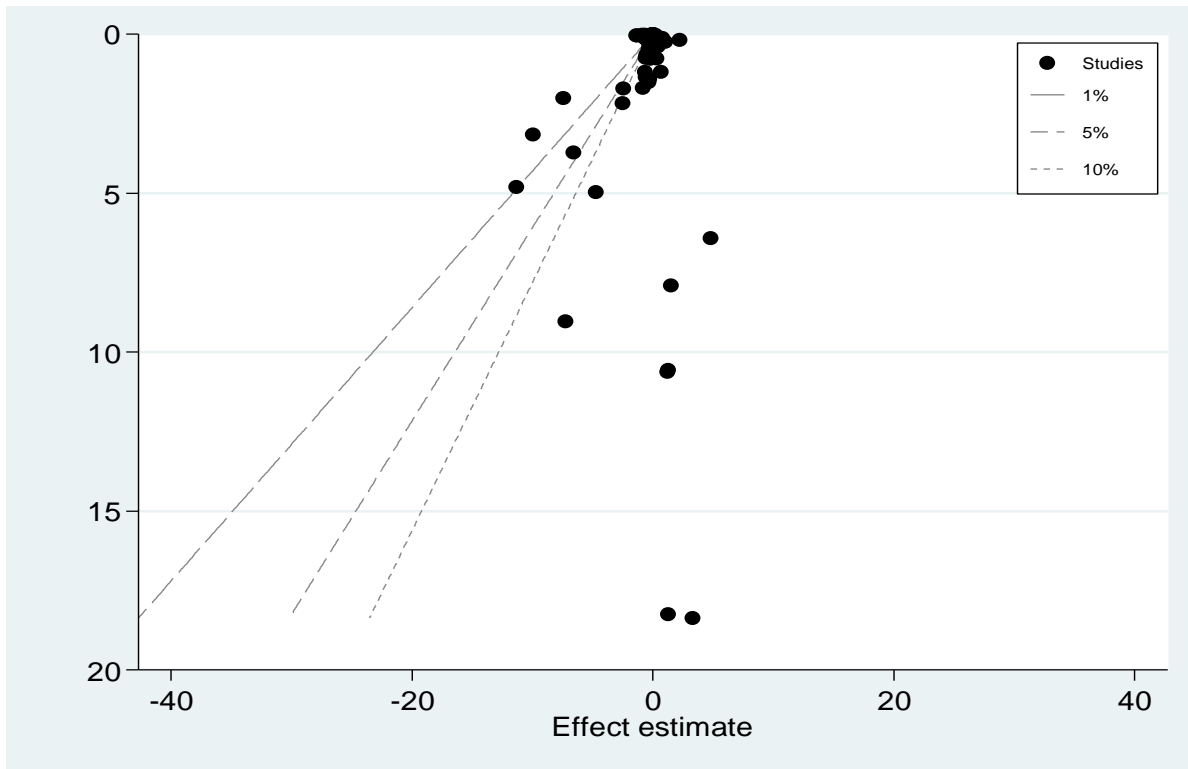


Figure 6

Confunnel using lower tail one-sided significance regions.

However, the graphs clearly shows as there are less estimates in low statistical significance, so it means that there are few studies that have been lost I using also this advanced test to verify bias by one side significance test.

### **3.8 Measuring Asymmetry Publication Bias: The Egger's Test.**

The last way to test publication bias is to use a linear regression approach to measure funnel plot asymmetry on the ES (study effect, in this case youth employment elasticity). The ES is regressed against the estimate's precision, the latter being defined as the inverse of the standard error (regression equation:  $ES = a + bx$  precision, where  $a$  is the intercept and  $b$  is the slope). This type of test has been proposed by BEGG and Maunder (1994) and by Egger ET all (1997). The test proposed by the last one is algebraically identical to a test that there is no linear association between the treatment effect (or in this case youth employment elasticity) and its standard error, and hence, that there is no straight-line association in the funnel plot.

Since precision depends largely on sample size, small trials will be close to zero on the horizontal axis and vice versa for larger trials. The test of the null hypothesis that the intercept equal to zero is not significant at the 0.05 alpha levels indicates that the line goes through the origin. The actual p-value is 0.228 (see results below) indicating that there is strong evidence in the data to not support rejection of the null hypothesis of zero intercept. Thus there is no publication bias and asymmetry.

Egger's Test for small study effects:

**Table 6**

Effect estimate against its standard error.

Number of estimations =161

Slope	0.32***
	(0.90)
Bias	-4.51
	(3.73)
N. observations	161

Test of  $H_0$  publication bias = p .1.20(null hypothesis= publication bias)

Further, the sign of the coefficient (-4.51) suggests that small studies don't overestimate the effect. The slope coefficient (0.32), with high statistical significance, which is an estimate of theta (that in a weak sense might be considered to be adjusted for the effects of publication bias) is greater than the effect estimated from meta-analysis estimating random effect (0.02) (it is going to be discussed in the following pages), strongly suggests that small and negative studies are not excluded.

### 3.9 The Empirical model/s.

Regarding the empirical model, following Card ET all (2009) and BoockMann (2010), it has been decided to build two different empirical models. In particular, the first one considers an order probit model, while an alternative approach is to perform a Meta regression. However, we have to consider that both models contain the same independent variables that have been derived studying the characteristic of the paper selected.

#### 3.9.1 The Ordered probit model.

In the ordered Probit model the dependent variable  $y^*$ (significance) measures the scale of significance.

$Y_i = (1, 2, 3, 4)$  for (significantly negative (5% level) insignificantly negative and positive, significantly positive (5 % level)).

The interval discussion role is:

$$Y_i=1 \quad \text{if} \quad y_i^* \leq u_1$$

$$Y_i=2 \quad \text{if} \quad u_1 < y_i^* \leq u_2$$

$$Y_i=3 \quad \text{if} \quad u_2 < y_i^* \leq u_3$$

$$Y_i=4 \quad \text{if} \quad u_3 < y_i^* \leq u_4.$$

As the probit model, we will assume  $y^*$  as function of observed and unobserved variables

$$Y = \beta_0 + x_{1i} \beta_1 + x_{2i} \beta_2 \dots x_{ki} \beta_k + \varepsilon$$

First of all, there is a need to underline as the numbers have to be considered as a code, so it means that number 4 is not greater than 1.

Table below has the aim to give information about the dependent variable.

**Table 7**

Significance	Frequency	Percentage	Cumulative
1	36	22.36	
2	82	50.93	22.36
3	33	20.5	73.29
4	10	6.21	93.79
Total	161	100	100

Analyzing the results, 50.93 per cent of the estimations results represent a negative but insignificant effect, while 22; per cent (36 estimations) represent a significant and negative effect. Of Course, no conclusion on the “true” effect of the minimum wage can be derived from these frequencies. The model is very common when we have many discrete outcomes that have a natural ordering but no quantitative interpretation. As explained before, the numbers in codes don’t mean anything, just an order to show the lowest and highest. The first thing that we can say is that because of the studies of references doing consider all the same definition of “young”, dummies variables have been included. In particular, we have three dummies variables for the age, one for paper which include people until 16 years old, the second one including people between 16 and 19 and the last one for the studies that consider people with age different from the first and second dummies variable. Regarding the gender, few data represent a distinction between male and female, while major paper restricts attention to low skilled workers. Considering the level of aggregation data, we distinguish between studies based on individual-level and aggregate data, where the former either relative to individuals or firm or establishment, or survey. All these differences have been included in the model using dummies variables. Regarding independent variable we take into consideration the institutional quality data by Aljaz Kunzic; it is very important because the role of the institutions have to be considered as the underlying basis for economic and social activity. He builds three groups of formal institutions: legal, political and economic, which capture to a large extent the complete formal institutional environment of country. Finally, it has been included 4 dummies variables which represent the country included in the paper: country is America, country1 country2 country3 represent respectively Spain New Zealand and Canada.

### 3.9.2 Results and interpretation.

The estimates (ordered probit coefficient) are displayed in the table for different six specifications. The dependent variable is coded such a negative coefficient implies a higher likelihood of a negative estimated effect on employment. First of all, regarding the results, in the ordered probity model (as in the probity model) we can interpret only the sign but not the magnitude of them. The most important thing to consider is that the Kaitz Index is always significant, (at 5 or 1 per cent). Analyzing the signs, we can see as only in the first specification it is positive, (it means that if Kaitz Index increases there is a higher probabilities to be in higher categories, that is significantly positive at 5 per cent), while in the other one it is negative (it means that with a higher Katz index it has higher probabilities to be in lower categories, that in this case means significantly negative (5% level). Concerning the variables for different populations group, no significant results are found, that is confirmed to the previous literature on this field<sup>44</sup>. Dummy variables for studies are either positive or negative but always not statistical significant. There is no indication of publication bias in the sense that negative and significant results are published with higher likelihood than insignificant or positive employment effects. Finally, regarding country dummies variables, there is a strong evidence that they don't influence the estimations (in fact only in one case country America is significant), it is because Kaitz Index gives us the possibility to control for different legal definition that minimum wage has in the selected countries. Finally there is a need to underline the meaning of cut (1, 2, and 3): first of all their standard errors compare the cut-point to 0, but the aim is to not understand the numbers, we don't have care about that; the aim is to know if they are different from each other. This can be made to test for quality of these cut points; the null hypothesis is that three cut points are equal, furthermore an important thing to take into consideration is that if they are equal, we can eliminate the middle category/code (is this case 2 and 3 codes). However, as we can see from the table, the joint test always reject the null hypothesis that three cut points are equal; so the middle codes of the dependent variable have to be taken into consideration.

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<sup>44</sup> See, for example: Booman, Berhard (2010): The combined employment effect of minimum wages and labor market regulation: A meta-analysis.



**Table 8**

Specification	Oprobit	Oprobit(1)	Oprobit(2)	Oprobit(3)	Oprobit(4)	Oprobit(5)	Oprobit(6)
Kaitz Index	-14.7*	-18.64**	-18.69**	18.69***	-18.91***	-18.77***	-18.3***
	(-7.45)	(-7.88)	(7.88)	(6.98)	(6.87)	(6.95)	(6.53)
School				-0.13	-0.13	-0.21	-0,25
				(0.31)	(0.31)	(0.35)	(0.30)
Age					-0.54	-0.61	-0.54
					(0.41)	(0.44)	(0.41)
Age1						-0.10	-0.10
						(0.24)	(0.24)
Age2							
Low skill workers	0.23	0.02	0.03	0.04	0.04	0.08	0.08
	(-0.27)	(-0.27)	(0.27)	(0.27)	(0.27)	(0.28)	(0.28)
Gender			0.01		0.19	0.23	0.23
			(0.03)		(0.34)	(0.36)	(0.36)
Aggregate	0.21	-0.02	-0.02	-0.21	0.07	0.03	0.03
		(-0.03)	(0.03)	(0.32)	(0.39)	(0.40)	(0.04)
Country	1.66**	0.04	0.04	0.44	0.44	0.4	0.4
	(-0,94)	(-1,2)	(1.20)	(1.20)	(1.20)	(1.20)	(1.20)
Country 1		-1.87	-1.88	-1.88**	-1.89	-1.88	-1.89
		(-1.16)	(-1.16)	(1.16)	(1.16)	(1.16)	(1.16)
Country 2							
Country 3			-0.13	-0.1	-0.09	-0.13	-0.13
			(-1.1)	(1.10)	(1.10)	(1.10)	(1,10)
Epl							-0.52**
							(0.26)
Union density							0.12
							(0.3)
Pseudo R	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Cut 1	-11.11	-9.33	-9.14	-9.07	-9.09	-9.02	-9.02
	(-3.8)	(3.0)	(3.28)	(3.28)	(3.28)	(3.29)	(3.29)
Cut 2	-9.49	-8.46	-8.6	-8.22	-8.24	-8.17	-8.17
	(-3.76)	(+3)	(-3.2)	(3.27)	(3.27)	(3.27)	(3.27)
Cut 3	-7.1	6.99	-0.14	-6.74	-6.75	-6.68	-6,75
	(-3.73)	(-2.98)	(-1.1)	(3.25)	(3.25)	(3.26)	(-3.25)

Test for Cut	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N Obseravations	161	161	161	161	161	161	161

### 3.9.3 Institutional variables.

Institutional variables could be very useful to describe countries' regulation system but it is not so clear if they have a different impact on the estimates of the minimum wage effect if they are taken separately.

Following Boockman, in this occasion we take into consideration two institutional variables such employment protection legislation and union density having unique estimates: this is what has been estimated in the last column (preferred). However, only EPL is significant, so it means that in this case only this one influences youth employment elasticity (obviously considering order probity interpretation).

### 3.10 Meta regression model.

The second/different approach is to perform a Meta regression on study level summary data. As explained before, we assume that Meta regression and ordered probity model have the same independent variables<sup>45</sup>; the only difference regards the dependent variable: in fact while in the order probity it is a code, in Meta regression it is composed.

Regarding the independent variables, they are exactly the same of the order probit model, while the dependent variable changes. In fact, considering the different approach of the models, in Meta regression it will be all the 161 points estimate of youth employment elasticity. Consequently, also the interpretation of thing results change; in the sense that Meta regression doesn't estimate the probability to be in higher or lower categories (or codes), but simply has to be interpreted as a multiple linear regression model.

#### 3.10.1 The empirical model.

The model is specified as:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 \dots + \epsilon$$

Where  $y$  is the effect size (in this case youth employment elasticity) in study  $j$

While  $\beta_0$  is the overall effect size. The variables  $x$  specify different

Characteristics of the study, while  $\epsilon$  specifies the between study variation.

However, we can choose between the models with fixed or random effect.

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<sup>45</sup> It is clear because has been used the same approach (systematic review): furthermore; the paper considered are exactly the same, so there has not been need to include different independent variable; also because in my opinion It would not have had meaning.

### 3.10.2 Fixed vs. Random effect.

Fixed effect model assumes that the sampled effect size  $\theta$  is normally distributed, where  $\sigma^2$  is the within study variance of the effect size  $\theta$ , i.e.  $\epsilon=0$ . It is based on the assumptions that all studies in meta-analysis share a common true effect size. In other words, all factors which could influence the effect size are the same in all study populations, and therefore the effect size is the same in all study populations. It follows that that the observed effect size varies from one study to the next only because of the random effect error inherent in each study.

It is represented by the following equation:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots n_j$$

In this case  $\sigma^2$  is the variance of the effect size in study j. However, we have to take into consideration that fixed effect Meta regression ignores between study variations. By contrast, the Random effect assumes that studies were drawn from population that differ each other in ways that could impact on the treatment effect. For example, the intensity of the intervention or the age of the subjects may have varied from one study to the next. It follows that the effect size will vary from one study from the next for two reasons: the first is random error between studies as in the fixed effect model, while the second is true variation in effect size from one study to the next. Finally, it rests on the assumptions that are a random variable normally distributed following a hyper distribution. Random effect Meta regression is represented by the following equation:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots n_j + \epsilon$$

The difference between random and fixed is represented by the residual.

### **3.10.3 Random or fixed effect model?**

Meta-regression has been employed as a technique to derive improved parameter estimates that are of direct use to policy makers. Meta-regression provides a framework for replication and offers a sensitivity analysis for model specification. There are a number of strategies for identifying and coding empirical observational data. Meta-regression models can be extended for modeling within-study dependence, excess heterogeneity and publication selection. The fixed effects regression model does not allow for between study variations. The random or mixed effects model allows for within study variation and between study variations and is therefore the most appropriate model to choose in many applications. Whether there is between studies variations (excess heterogeneity) can be tested under the assumption that effect sizes are homogeneous or have a tendency to a central mean. Unfortunately, we don't have the best model to always use in any case, but we can have some indicators that are able to "indicate" which model to use.

For example, when we believe that all studies included are functionally identical and that the effect size is not generalized for other specification but only for the identified population, then we have to use fixed effect.

Considering all this, the choice has been to perform a meta-regression with both fixed and random effect, analyzing the differences between them.

### **3.10.4. Meta regression fixed effect regression: results and interpretations.**

The table below has the aim to show a meta-regression using fixed effect.

As we can say from the estimation, also in this case the Kaitz Index has a statistical significant impact. The sign, as in the ordered probit model is negative ; so it means that using this method of estimation the unitary increasing of minimum wage has a negative and very significant effect on youth employment elasticity ( considering different specifications, from 12.86 to 13, 28%,). Regarding the other variables, as in in the order probit model, we don't have significant result for the population group (holding other things equal). The intercept is in the most cases statistical significant, with both positive and negative sign. Considering the dummy variables, a negative coefficient indicates that the

null category yields a less youth employment elasticity effect while a positive coefficient indicates the opposite. Regarding country effect, they are statistical significance only in few cases and this is true only for a partial part of the country considered. Considering the dummy variable school (value 0 if not enrolled, 1 otherwise), the two statistical specifications don't have the same sign (specification 2 +0.40, specification 3 -0.85), underlining as being enrolled in school can impact both positively (0.40%), or negatively (-0.85%) on youth employment elasticity. Considering the dummy for age, only age2 (age not included in included in age1 and age2 has a significant impact on youth employment elasticity. Regarding the type of the data, its use seems to have a statistical and significant impact on youth employment elasticity only in two estimations.

**Table 9** Meta regression with fixed effect.

Dependent variable= youth employment elasticity.

Specification	VWLS (1)	VWLS (2)	VWLS (3)	VWLS (4)	VWLS (5)	VWLS (6)
Katz Index	-12.86***	-13.28***	-13.28***	-13.28***	-13.28***	-13.28***
	(5.04)	(5.10)	(5.10)	(5.10)	(4.28)	(4.30)
School			0.40***	-0.86***	0.71	0.71
			(0.18)	(0.88)	(0.60)	(0,60)
Age				0.87*	0.00	0.00
				(0.38)	(0.3)	(0,3)
Age1						
Age2					-1.2*	1.2*
					(0.4)	(0.4)
Skilled	0.10		0.10	0.10		
	(0.15)		(0.15)	(0.15)		
Gender					-1.11	-1.11
					(1.13)	(1.13)
Aggregate	-0.20	-0.25		0.15***	0.15***	-0,15***
	(0.17)	(0.19)	(0.03)	(0.6)	(0.6)	(0.6)
Country	-0.73**	-0.75*	0.75	0.75	0.75	0.75
	(0.42)	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)
Country 1			0.79*	0.79	0.79	
			(0.42)	(0.42)	(0.42)	
Country 2						
Country 3						
Epl						-0.70
						(0.37)
Union Density						-0.25
						(0.4)
Interc.	-4.04	-4.96	4.17	-1.94	-1.94	-1.94
	(1.44)	(1.83)	(1.44)	(2.68)	(2.68)	(2.86)

- \*5 per cent \*\*\* 1 per cent \*\* 10 per cent

### **3.10.5 Random effect meta regression**

Considering that Meta regression with Random Effect uses a more conservative approach; it has been estimate using meager command in State, Random Effect Multilevel Model (REML) specification analysis<sup>46</sup>. Taking into consideration always the same variables we have the following estimates:

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<sup>46</sup> Source: Stata Journal



**Table 10**

Specification	REML	REML (1)	REML (2)	REML (3)	REML(4)	REML (5)	REML(6)
Kaitz Index	-1.17*	-1.17*	-0.93*	-0.92*	-1.19*	-1.28*	-1,28*
	(0.65)	(0.65)	(0.51)	(0.51)	(0.61)	(-0,67)	(-0,67)
School			0.79***	0.79***	-0.79***	-0.86***	-0.86***
			(0.13)	(0.13)	(0.13)	(0.15)	(0,15)
Age				-0.5	-0.01	-0.07	-0.05
				(0.08)	(0.08)	(0.10)	(0.10)
Age1						0.72	0.72
						(0.79)	(0.79)
Age2							0.50
							(0.7)
Low Skilled workers						0.54	0.54
						(1.21)	(1.21)
Gender		0.04	0.69	0.06	0.06	0.10	0,10
		(0.48)	(0.49)	(0.5)	(0.05)	(0.51)	0,51
Aggregate	0.12	0.12	0.15	0.15*	0.15	0.13	0,13
	(0.07)	(0.07)	(0.70)	(0.07)	(0.07)	(0.17)	(0.17)
Country	-0.14	0.04	0.14		-0.18	0.00	0,00
	(0.78)	(0.49)	(0.26)		(0.35)	(0.32)	(0,32)
Country 1					0.19	0.19	0.19
					(0.25)	(0.25)	(0,25)
Country 2							
Country 3					0.07	0.05	0.5
					(0.8)	(0.8)	(0.8)
Epl							-0,60**
							(0.30)
Union density							-0.55
					(0.32)	(0.32)	(1.6)
Tau2	0,02	0.02	0.02	0.01	0.01	0.01	0.02
I-Squared	97.30%	96.36%	96.36%	96.38%	96.39%	95.93%	96.00%
Adjusted R squared	0.41%	0.39%	0.40%	27.89%	28.17%	31.94%	33.00%
Intercept	0.56	-0.68	0.56	-0.61	-0.95	0.96	-0.96

	(1.00)	(1.20)	(1.00)	(1.30)	(1.39)	(1.40)	(1.40)
N Observations	161	161	161	161	161	161	161

As it is very easy to understand, the independent variables are in great part not statistically significant ; it confirms the more conservative approach of meta- analysis with random effect model<sup>47</sup>: in fact only the dummy variables school has a statistical significance only in two regressions; while in fixed the estimators have statistical significance in several cases. However, there is a need to underline as, also if with lower statistically significance, kaitz index has always a negative effect on youth employment elasticity.

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<sup>47</sup> See, for example, Jon P. Nelson (2013): Estimating the price elasticity of beer: Meta-Analysis with heterogeneity, dependence and publication bias.

### 3.11 Conclusion.

This chapter was born with the aim to give a real contribution to a very important issue such as the size of the impact of the minimum wage on youth employment.

To do this, meta-analysis method of estimation has been used taking into consideration several issues such as publication bias and asymmetry.

The first and most important step too is the collection of data; this has to be done paying more attention, first all because it can cause publication bias, but also because it influences estimates. After showing more and different way to verify and publication bias, next step has been to build an econometric model to understand in empirical way what has been explained before.

The first considered model, is a probit model one, which considers as dependent variable the scale of significance(from 1 to 4): all the estimate clearly shows as minimum wage expressed as Kaitz Index has a negative impact( in different percentage and including different explanatory/control variables) on youth employment elasticity.

However, the same job could do using another technique denominated meta-regression: the variables are the same; the only difference is that in this case the dependent variables are noting a code but it is composed. It can be performed considering random effect or fixed effect: random effect is some cases are preferred to the fixed one; however, to avoid any debate, both models have been estimated also to figure out which could be the difference and above all why.

To sum up, both model additionally confirm the negative impact of the minimum wage(expressed as Kaitz Index) on youth employment elasticity; also if there is as need to underline how differences between estimates(fixed effect shows a stronger impact; however in both specifications; the coefficient is negative and significant at 1 per cent.

The conclusion is that, also if with different level of significance, but using different econometric model; we are able to definitively conclude as the minimum wage as a negative impact on youth employment; it has been a great debate in the literature in the last 15-20 years, and this chapter, tries to give a contribute into resolving this strong and widespread debate.

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