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Mental Health and Unemployment

A European overview about their correlation regarding the different unemployment systems

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Table of Contents

Introduction

The aim of this work is to better understand in which way the unemployment benefit can improve the well-being and the welfare of a developed country.

This work has born from the question if the expenditure on the Unemployment Benefit System has got an important impact on social well-being, this because different literature explains very well the social cost of unemployment and at the same time the social costs of mental disorder that should be related to the unemployment.

Another aspect to take in consideration is that after the 2008's economic crisis there has been an increase on unemployment benefit in all European countries, and this does not reflect only on the unemployed people, but on the whole social welfare of the country. This because its cost is not only related to income loss, but it goes beyond.

Many studies used variables like life satisfaction to measure the effect of unemployment on happiness and well-being, but different results are found, even because life satisfaction is a measure that is strongly biased from different issues like the weather, the period of life in which the interviewed answer to the survey and so on.

The first chapter will be focused more on the mental health, and the relation between unemployment and well-being. It is a sort of summary and some conclusions from different literature which considered those two social issues. As we will see in this work, mental health is more and more a social issue that concerns unemployment and, for that, a social cost.

In the second part of the work, I will go through the unemployment rate in Europe, with descriptive statistic about unemployment rate and unemployment benefit expenditure as percentage of GDP. Then, the chapter shows the main differences and characteristics of unemployment benefit system, because countries have different labour markets, that means different government balance budgets and different generosities. And then, there will be a focus on the benchmarking of unemployment benefit generosity, and the formula for the indicator that will be used in the second part of our analysis.

We will also focus on the description of the variables used, and the definition of the model in the fourth chapter, and it will be shown the results obtained from the analysis, this part will also contain the limits of the analysis and at the end, the conclusion.

The analysis of this work is made with country-level data, and those are aggregated data, this means that what we will find cannot be considered at the individual level, we work at country level. Fortunately, there is strong literature about the relation between unemployment and mental health, or at least happiness as life satisfaction. And in this work in the first part, we resumed the most important assumption and findings of the literature.

Another reflection we want to introduce in our analysis consists of the indirect cost of mental health for the labour market. In fact, what we examined in the first and second chapter is, through descriptive statistic, the expenditure on unemployment benefits, the social cost of mental illness and the percentage of people with mental disorders.

First Part: Literature Review and Reasons of the Research

In this first part we will go through the literature review and the reason why this research is important. In the first chapter we will explain the relation between well-being and labour and the related literature, with a particular focus on the relationship between mental disorders and unemployment. The first part will count chapter one that is about well-being and labour, chapter two that will explain the unemployment benefit system in the EU and the chapter three that will describe from the related literature the correlation between mental health and unemployment.

Before starting the literature review, we would like to define the major variables and terminology considered in this work. We can describe mental illness as the loss of mental health due to mental disorder. Mental health problems cover different illnesses such as depression, bipolar disorders, anxiety, drugs and alcohol use disorders. We do not consider in this work mental disorders like dementia, because it is a genetic disorder, and it should bias the result. We want to consider those disorders that should raise and be reconducted to the working environment or the social and economic background. This because in that way we can try to see the relation between unemployment benefit generosity or unemployment benefit and mental disorders. The other variable that will be discussed during this work is the unemployment, that, according to the European Commission, should be defined as the situation when a person who is actively searching for a job, cannot find it. In this work we will consider the short-term unemployment rate as explanatory variable of unemployment.

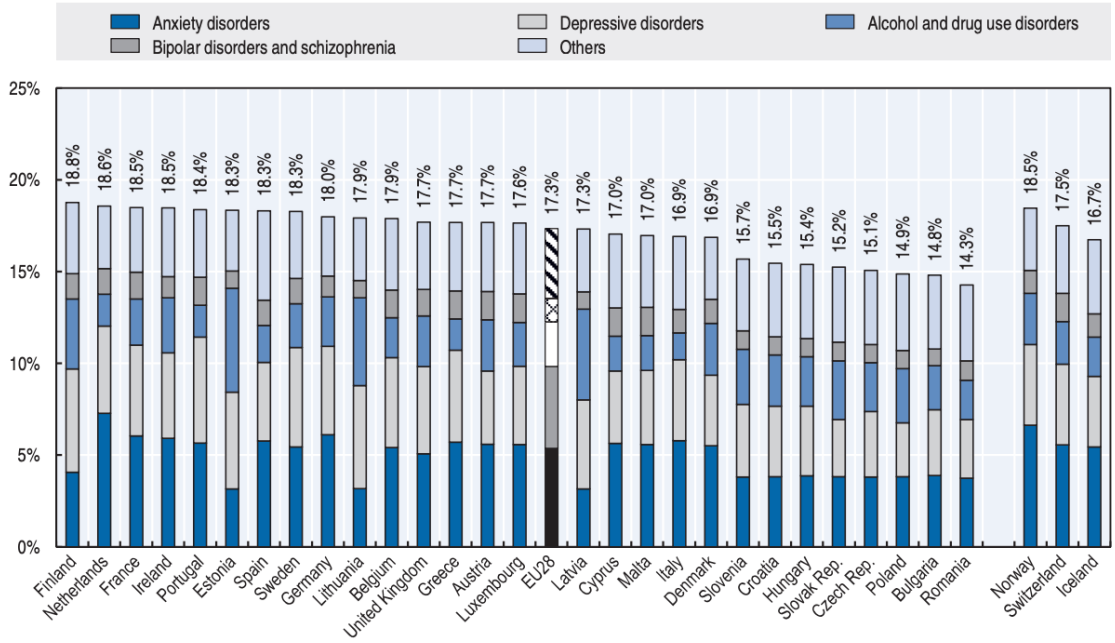
Another difference and definition we have to be confident with, is the difference between correlation and causation. In fact, during this work there will be different correlations and relationship between unemployment and mental disorder, labour and unhappiness and so on. For that reason, we need to keep in mind the difference in concepts and terminology. In this work we will speak about correlation and not causation. This because econometrically speaking is quite difficult to determine the causation, that considers the happening of an event as the result of the other event. Instead, the relation, or relationship, of two variables is verified when if one of the two variables changes, also the other variable changes. The correlation, statistically speaking, describes the relation; it should be positive or negative, and it gives the size of the relationship. This does not involves that one variable changes due to the change of the other. There should be some other variables and unobservable effects that cause the change of the variables.

Chapter One: Mental Health and Labour

In the first chapter we will focus on the descriptive analysis of the problem, and its importance. We will go through the distribution of mental health in the European countries and the cost of mental illness. Well-being and mental health are at the basis of happiness and strictly linked to a productive and fulfilled life. According to different social studies we know that mental illness can affect everyone in certain period of life, men and women with different social and economic backgrounds.

Some surveys (OECD, 2018) show that the majority of households suffers or has suffered of mental illness. In the figure 1.1 taken from the OECD (2018) survey, it has shown the spread of mental health problem in Europe. The impact of this type of illness is more and more studied because it is more and more a social issue, in particular, it is not an indifferent social cost.

Figure 1.1. **More than one in six people in EU countries have a mental health problem**



Source: IHME, 2018 (these estimates refer to 2016).

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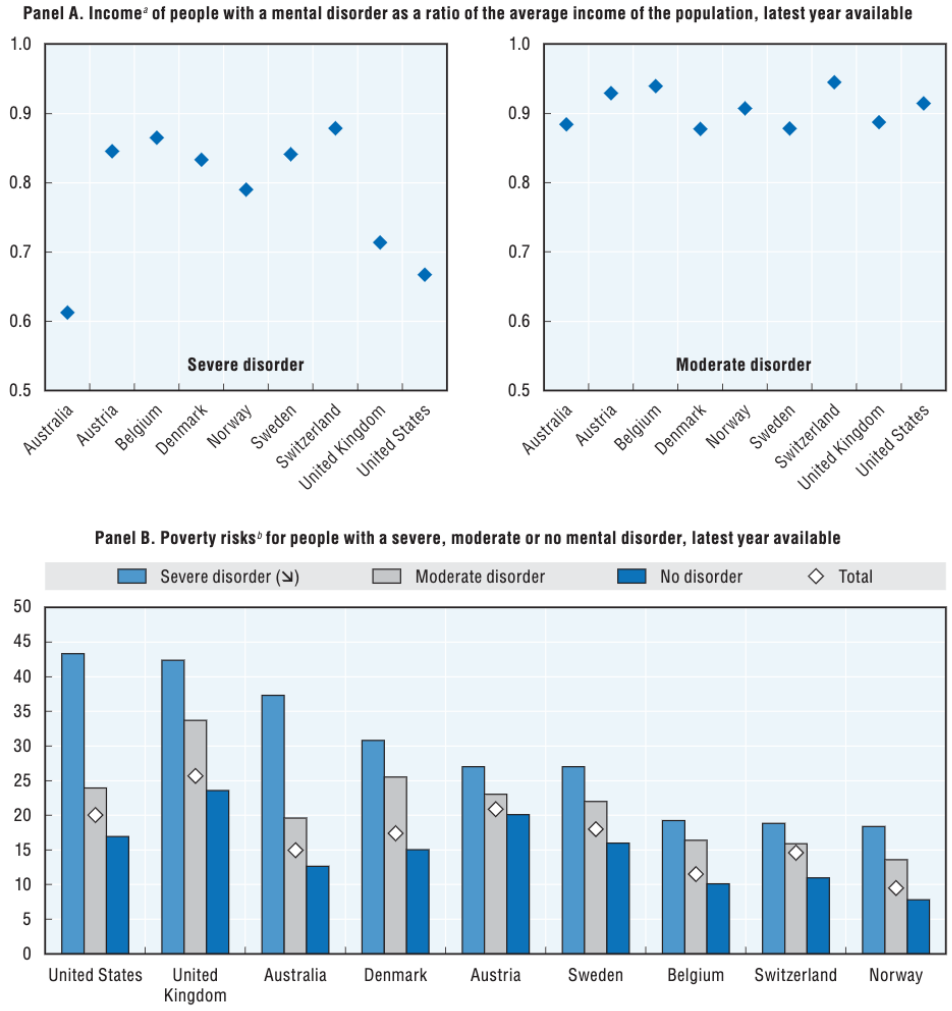
In the figure 1.2 it is shown how mental disorder affects the risk of people to be poor, the graph comes from an OECD's report (2012). It helps us to better understand the impact of mental illness and its social cost, at the same time it is an argument in support of our research, in fact mental health is an argument more and more important at policy level.

Figure 1.2 **People with a mental disorder have lower incomes and a much larger poverty risk**



a) Per person net income adjusted for household size. For Australia and Denmark, data refer to gross income.
b) The low-income threshold determining poverty risk is 60% of median income.
Source: National health surveys (see Figure 1.3).

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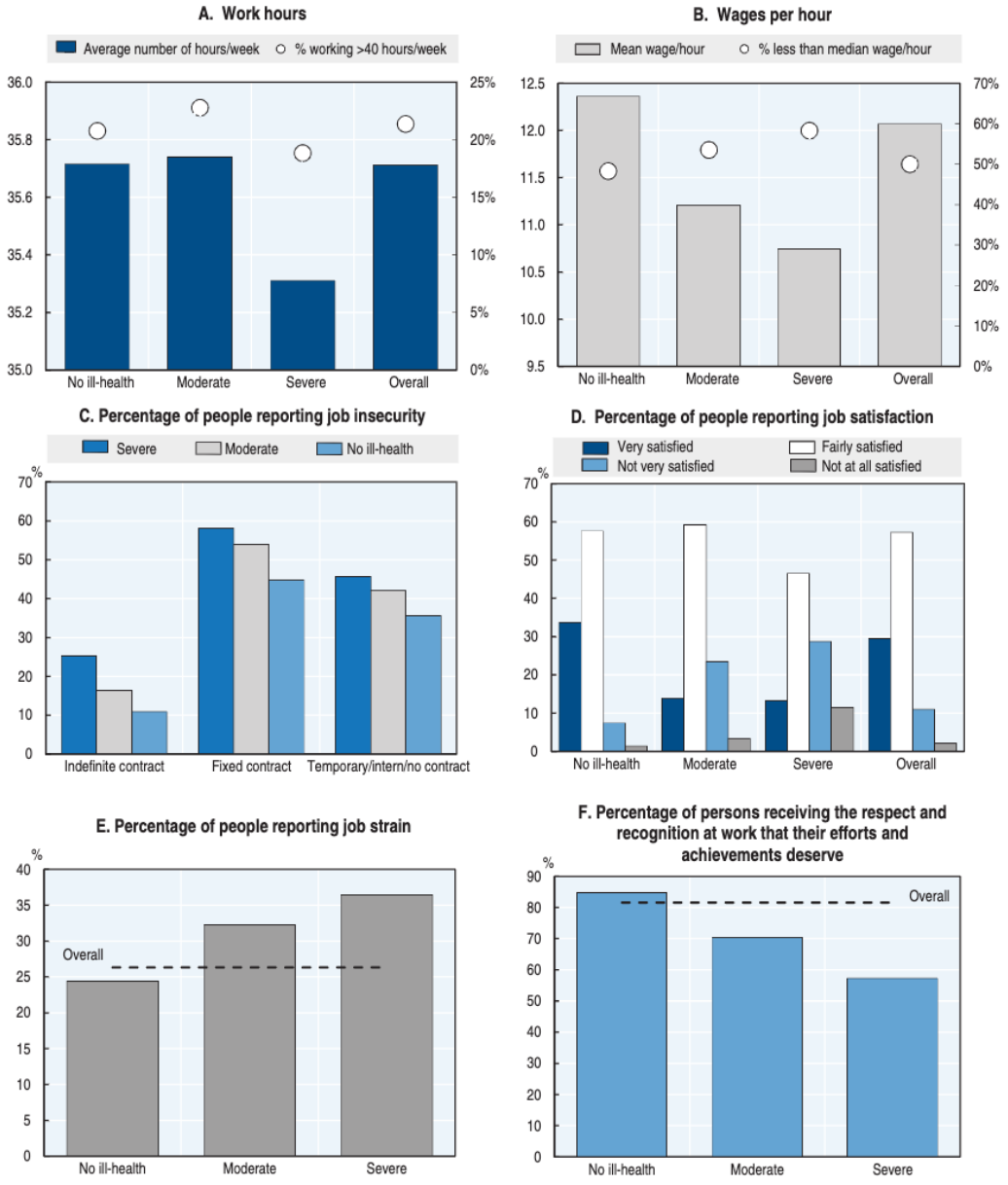
According to an OECD paper (OECD/EU, 2018) about health in EU, we know that tens of millions of people had at least one mental problem, and that tens of thousands die each year due to this problem, or due to problems related to that. OECD estimates that the total costs related to mental problems across the EU countries in 2015 was about more than 4% of GDP, this amount considered different expenditures such as social securities, health care and indirect costs in labour market. For that reason, many European countries are trying to implement some policies to prevent mental illness.

Figure 1.3 **Workers with mental ill-health work in jobs of poorer quality**

Average outcomes over a selection of European countries, 2010



Note: Data refer to the country averages established by Eurobarometer and the European Working Conditions Survey.
Source: OECD calculations based on Eurobarometer 2010 (Panels A, E and F) and the European Working Conditions Survey 2010 (Panels B, C and D).

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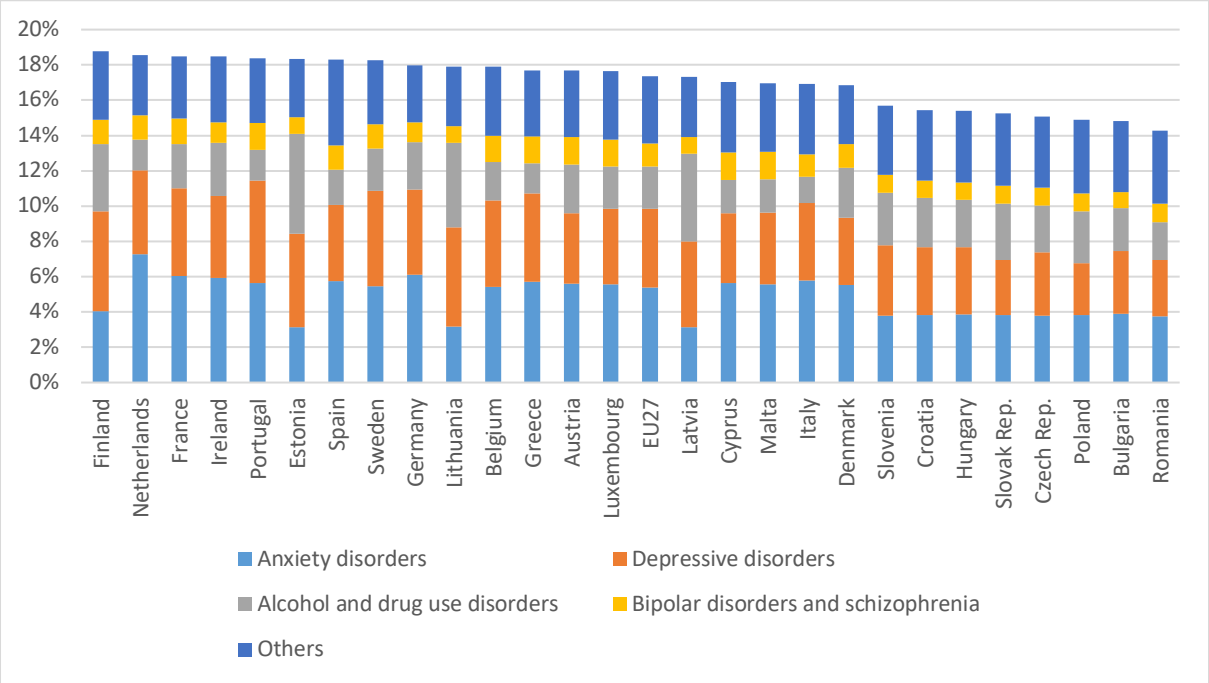
In Figure 1.3 we can see different data about the condition and the distribution of workers with mental illness, it is clear that people with mental disorders work less and in job with a lower wage.

In the following graph (Figure 1.4) we can see the rate of population with mental health problem, that should be bipolar disorders, depressive ones or anxiety disorders or alcohol and drugs use.

Figure 1.4 **Mental Health Problems on European Population in 2014**



Generally, we know that people show lower levels of depression if they are employed, and numbers are not completely strong due to the fact that in some countries there is still a sort of stigma against the idea of mental disorder, or at least those type of disorder are related only to strong disabilities and most of the time are not recognized or accepted. There is also empirical evidence (OECD 2015) that people with mental disorder show a decrease of the illness after finding work and it is true the opposite that it is more common to see mental disorder, in particular depression disorders, among people who have lost their job.

Even the type of disorder can change between men and women, in fact while in women are more common illnesses like depression, bipolarism and anxiety, men report more problems on alcohol and drug use. Moreover, we know that chronic depression has also a time impact, in fact it is more spread between people in middle age, it is also related to the fact that depression is also increased by the reduction of physical strength (Grundy, van den Broek and Keenan, 2017).

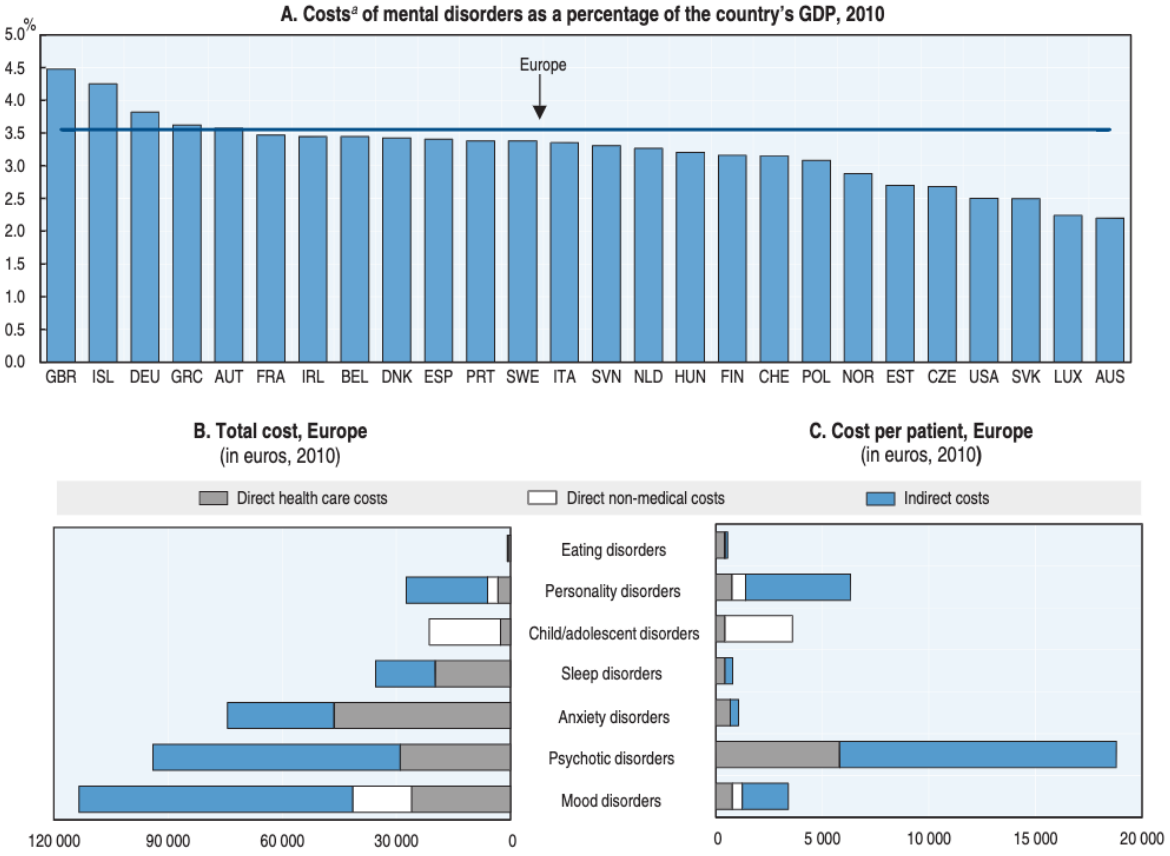
We care about the mental health problems because those exceeded the 4% of GDP and this amount is a clear sign of the necessity to increase social policies and efforts to fight and prevent mental disorders. The highest amount, the 1.6% of GDP is related to indirect costs from the labour market, and this is not the real amount because those didn't consider the increase on social spending for mental health and the impact of the reduced employment rate.

The impact of indirect costs related to mental health change by countries, in fact, it ranges from 2% to 5% of GDP and those variations depends on individual reporting of mental disorders, this means that in Nordic countries like Denmark, Finland, the Netherlands and Belgium, mental disorders are more recognized and socially accepted than in eastern countries. In the

next paragraph it will be explained the relation between unemployment and happiness to better understand the analysis we want to do and the research question.

The figure 1.5 below is from the OECD report "Fit Mind, Fit Job" (2015) and it shows the costs of mental illness for different countries' economies. Those costs are considered in different ways. We can divide those into three main categories: intangible costs (losses in labour productivity); direct costs (health care system) and indirect costs (benefit system). This graph explain why it is always more important to understand the relation between mental disorders, quality of life, and, as we discuss in this work, unemployment benefit.

Figure 1.5 **The costs of mental ill-health for the economy as a whole are high**



Note: "Costs" in Panel A are percentages of GDP expressed as millions of Purchasing Power Standard (PPS) for European countries. For Australia and the United States costs are expressed as percentages of GDP in current prices. Data for the United States are from 2005.

a. Cost estimates were prepared on a disease-by-disease basis, covering all major mental and brain disorders. This chart includes mental disorders only.

Source: OECD compilation based on: Gustavsson, A. et al. (2011), "Cost of Disorders of the Brain in Europe 2010", *European Neuropsychopharmacology*, No. 21, pp. 718-779 for European countries; Medibank Private Limited and Nous Group (2013), *The Case for Mental Health Reform in Australia: A Review of Expenditure and System Design* for Australia; and Bayer, R. (2005), *The Hidden Costs of Mental Illness*, Upper Bay Counselling and Support Services for the United States.

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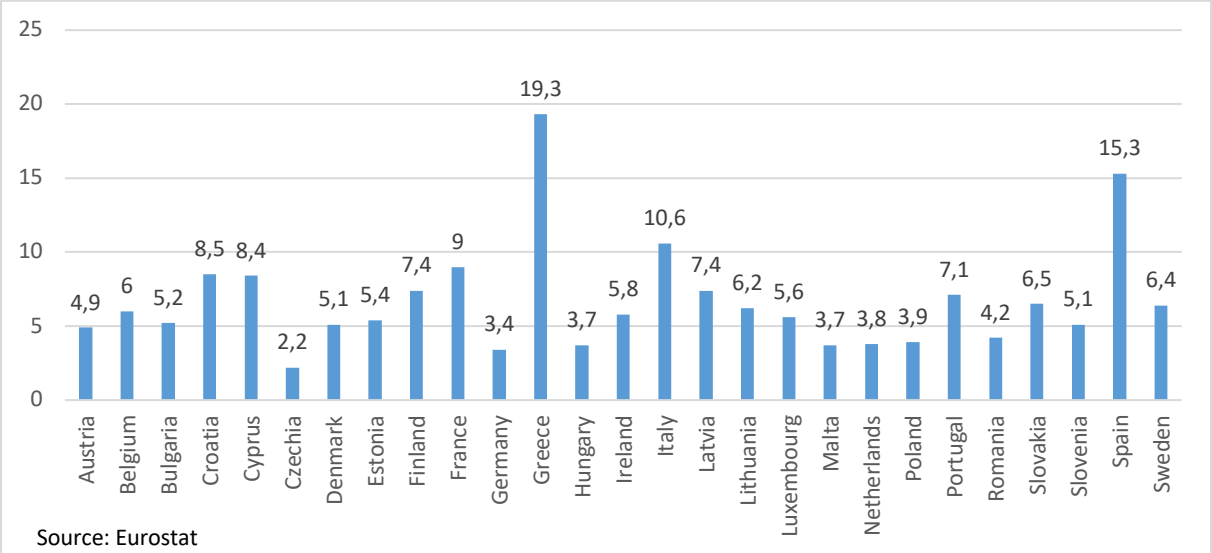
Chapter 2: Unemployment benefit system in EU

This chapter focuses on the analysis of the unemployment like the unemployment rate, the expenditure on unemployment benefit, the different unemployment systems and the unemployment generosity at the European level, in fact all the data and the descriptive statistic below concerns the European countries.

2.1 Unemployment in the EU

First, we have to consider that the unemployment in Europe is increased after the economic crisis. And governments have seen the amount of unemployment benefit vastly increased after the 2008. For this reason, it is always more and more important to understand if the expenditure on unemployment benefit, and how it is spread, has an impact on social well-being.

Figure 2.1 **Unemployment rate in EU countries in 2018**

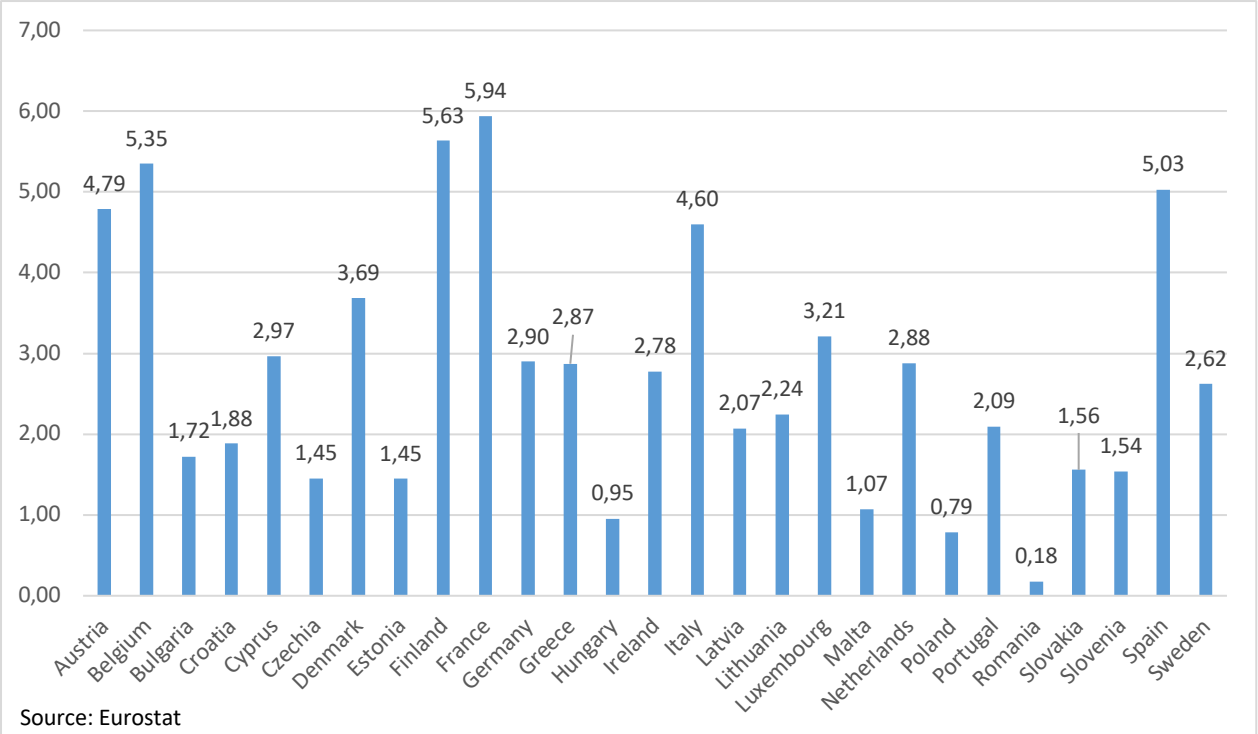


In this graph we can see that the unemployment rate is different among European countries, for this reason it is also important to have different unemployment benefit systems. In these chapter we want to see which countries spend the most on unemployment. Moreover, we want to go through the reasons why we have chosen those variables and the limits of these ones. In the graph it is clear that countries with the highest unemployment rate are Greece (19,3%), Spain (15,3%) and Italy (10,6%) and countries with the lowest ones are Czechia (2,2%) and Germany (3,4%).

The expenditure for unemployment benefit changes from country to country because it is a national social protection. Thanks to the data we can see that the expenditure as percentage of GDP for the unemployment benefit has a high variance among countries.

In the graph 2.2 below it is possible to see that the countries that spend more on Unemployment Benefit are France (5,94%), Finland (5,63%) and Belgium (5,35). Instead, at the bottom of the list there are Romania (0,18%), Poland (0,79%) and Hungary (0,95%).

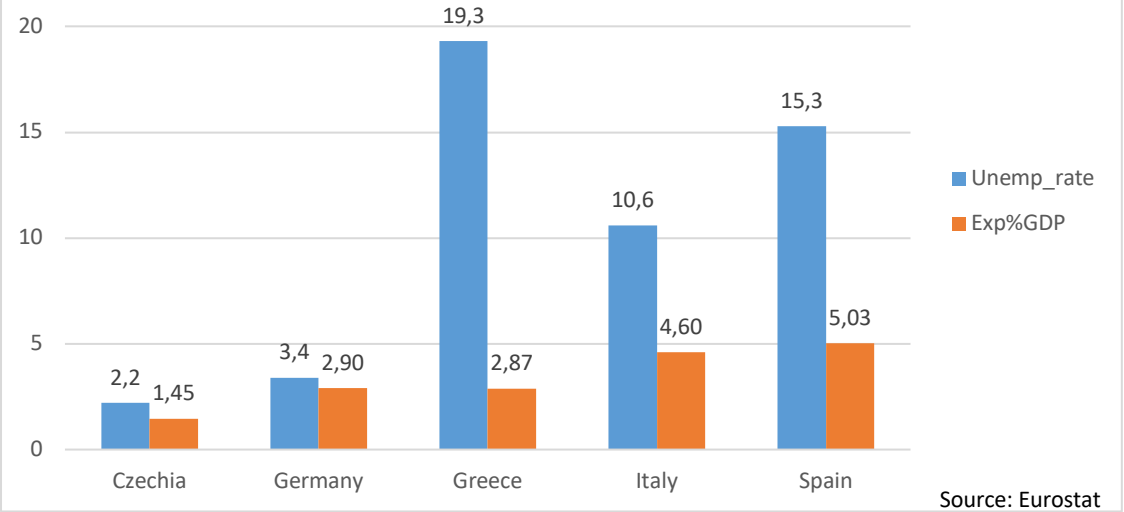
Figure 2.2 **Expenditure on Unemployment Benefit as % of GDP in 2018**



Source: Eurostat

A little focus on the countries with the highest and the lowest unemployment rate, shows that, a part of Greece, countries with higher unemployment rate spend more on Unemployment benefit than countries with lower unemployment rate (see Figure 2.3). This evidence let us imagine different possibilities and policies directions. If unemployment is strongly felt and considered as a present and important problem also the political agenda will consider it, for that reason our analysis about the impact of unemployment benefit on mental disorder seems more and more necessary and useful.

Figure 2.3 **Unemployment rate and Expenditure on Unemployment Benefit**



Source: Eurostat

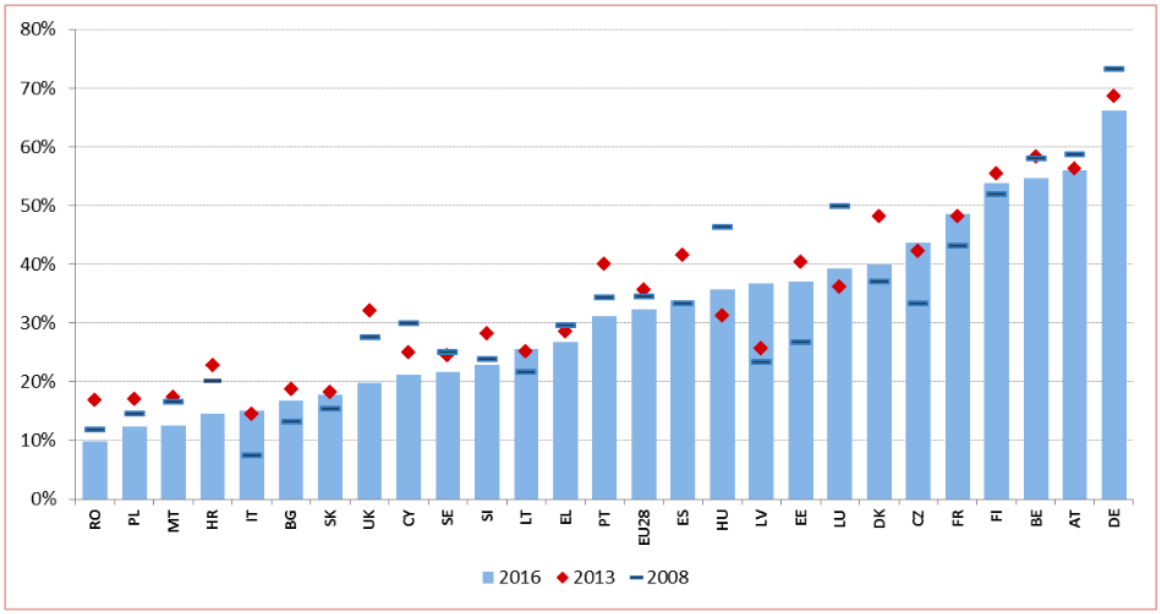
2.2 Unemployment benefit System

The unemployment benefit system is at the basis, with the healthcare system, of each European country when we speak about welfare. Its aim is to provide a social security net and protects people from poverty. In Europe there are a large variety of unemployment benefit system because they have to operate in different framework, economically and institutionally speaking.

The unemployment benefit systems could depend on the administration, others on the eligibility conditions and other more on the principles for determining entitlement levels.

Unemployment benefits insure people during short and long-term unemployment, those are considered as key instruments for the labor market risk. The moral hazard, as we find in vast literature (Moffit, 2014), shows that more generous the benefit is, longer the period of unemployment will be.

Figure 2.4 **Coverage of unemployment benefits for short-term unemployed (in 2016, 2013 and 2008)**



Source: Eurostat.

Note: data for Ireland, the Netherlands and Austria are not available. Change is expressed in points.

In figure 2.4 it is shown the coverage of unemployment benefit for short-term unemployed. The vertical bars indicate the performance, instead the horizontal bars indicate the change levels. Those data are for three years and give us an idea of the differences of unemployment benefit across European countries.

The major aim and challenge of the unemployment benefit is to find a balance between the support of unemployed person and the incentive to be active in the labor market. The amount and the duration can differently change, this because if it is too low it reduces the living conditions of unemployed people and if it is too short, people have not enough time to find the perfect match on the labor market.

Another aspect that should be taken in consideration is about the compulsory participation in specified programme which had the aim of update unemployed people to better fit on labor market. It is important to consider two types of unemployment, the short and the long term, both of those are influenced by the unemployment benefit, and both impact on the poverty that is correlated to the social welfare.

Different literature (Stovicek, Turrini, 2012) shows that there are several parameters which impact the outcomes, thanks to the unemployment benefit system. Once of those parameters is the duration. It is the most argued, because it is a safety net, and at the same time it is a disincentive to be active on the labor market, but it has a direct impact on poverty rate.

Another discussed aspect of duration is that it impacts only the poorest population, in fact it doesn't impact on the overall unemployed population, or its impact is weak since unemployed people try to keep the same living condition, to better job matching. As we said before, among countries, we can find several differences, in fact countries that have a higher expenditure for unemployment benefit show a fasten reintegration for the unemployed.

Other differences between unemployment insurances are about the form of state participation, in fact, in eurozone countries we can find four main forms of participation: fixed contribution, state covers deficit, state provides subsidy and state does not contribute.

According to a paper from the European Commission (July 2013) we know that countries with fixed contributions from the state are Luxembourg, Malta, and Cyprus. For others like Austria, Belgium, Slovakia, Ireland, and Finland the state covers the entire deficits, instead there are also states that directly provide a subsidy to unemployment insurance like in Germany, Greece, Spain, Slovenia, and Italy, in other countries, like France, Portugal, Estonia and The Netherlands state doesn't participate.

We know that benefit duration is one of the basic characteristics and it is strictly correlated to the expenditure on unemployment benefit. For example, Belgium, France Spain and Finland, countries that spend more on unemployment benefit are also countries with the longest duration of the unemployment program.

There should be different traps related to the unemployment benefit system and we will go through those to understand better the causes of the differences on European systems.

- Unemployment traps: normally, it is related to an inappropriate tax design or benefit system and consider those low net income workers who can benefit from the unemployment benefit. The negative effect could be large on labour supply.

- Benefit dependence: it is the risk of incentive of refusing job offers this type of risk increases for two main reasons, the first one is the duration, and the second one regards the case in which the job search or requirements are insufficient, and the replacement rates is not over the unemployment spell.
- Inactivity traps: this considers the low net income gain from taking up work from inactivity. If it is large there should be the risk of strength on structural unemployment, due to the reduction of the attachment of people from labour market.

2.3 Unemployment benefit Generosity

The European Commission wrote a paper on benchmarking the unemployment benefit systems and in this analysis, it will be used its index about unemployment benefit generosity. We always have to consider that each county has got its features, its policies and its own labour market, this means that it us not so easy to compare different social benefit systems and benchmarking them.

After the crisis, the unemployment rate increased in most European countries, and with it, the need to do new reforms that could answer to the trade-off between incentives to take up jobs and income smoothing. And the aim of the reforms is to balance fiscal costs with social protection.

According to the paper about unemployment generosity (Turrini, 2012), in this work, we will use the value they calculated, and in this section, we will go deeper on the analysis of the index. In fact, it does not only consider the cross-country statistic to start the analysis, but it analyzes different dimensions and similarities across countries both economically and from a policies point of view.

There are two main instruments that characterized the unemployment benefit system and those are the unemployment assistance and the insurance. The insurance instrument is based on insurance principle, and it pays unemployment benefit to those people who lost their job, but only if they completed a minimum period of work. Its aim is to insure individual income during the unemployment period. Instead, the assistance principle is based on welfare principle. It is used for those individuals that fall in the long-term unemployment, and they have no means to survive. Its aim is to prevent poverty related to unemployment.

The three main dimensions of measuring policy performance, according to the European Commission (Factsheet, 2017), are the levels and changes in coverage of the short-term unemployed, the rate of long-term unemployment and the poverty rate among the unemployed.

The value we are going to use in this work consider different dimension to compare European unemployment benefit systems. The consideration allows the evaluation of the unemployment benefit systems in more levels, in particular, it allows the evaluation of the effects on incentives to re-employment and the effectiveness of income support.

- Effectiveness of income support: the aim of the benefit is to support income and with that ensure the consumption smoothing to the unemployed during the short-term unemployment. It not only depends on the generosity on the amount, but also on the entitlement conditions to have the unemployment benefit.

- Effects on incentives to re-employment: there is a risk related to the unemployment benefit, and it is the disincentive that the unemployment benefit could give to those people that have to search for a new job. This is a trade-off between the economic efficiency and the

income smoothing. In fact, due to the income replacement there is a decrease of the incentive of the research and take up job. We have to care about this fact because it can explain the generosity and the duration of the unemployment benefit.

The generosity of the system we are going to use is not only based on both levels of unemployment assistance and insurance and their replacement rates, but moreover on the structure of unemployment spell and the duration. The synthetic indicator used in our analysis is described below.

We will analyze the system through different indicators, in particular the unemployment traps, the time profile of benefits, the entitlement conditions, the inactivity traps, the duration, and the job search and work availability. The major source of the indicators is the European Commission-OECD Tax and Benefit project based of the OECD Tax and Benefits models (Carone 2003) and the description is available on the OECD website[1].

Starting from the dimension, the indicators consider different characteristics of the instrument that better fits (unemployment assistance for the risk of inactivity traps instead of the insurance of unemployment traps, and both for the benefit dependence).

- Unemployment traps: they are calculated through an indicator of financial incentives for the search of a new job on the unemployed. The indicator measures the marginal effective tax rate on labour. It ranges between 0 and 100, and if a value is high, it means that there are low incentives to search and take up work.

- Time profile of benefits: it is the ratio between second and fifth year in unemployment and that in the first year of the average net replacement rates of unemployment assistance or insurance.

- Entitlement conditions: the indicator consider a score between 1 and 5, from the least to the strictest and it gives a measure of coverage.

- Inactivity traps: similar to that of unemployment traps, this indicator considers the disincentive of unemployment assistance to take up work.

- Job search and work availability: it is between 1 and 5 from the least to the strictest, and consider how much and person who benefit of the insurance is available on the labor market.

- Duration: this indicator considers as target, 40 years old people with 22 years of contributions.

From the European Commission paper, we took the formula of the indicator that is:

[1] http://www.oecd.org/document/3/0,3343,en_2649_34637_39617987_1_1_1_1,00.html.

$$UBgenerosity = \sum_{i=1}^{k} nrr_{UI,i} * duration_{UI,i} + nrr_{UA} * duration_{UA}$$

Where ***nrr*** considers the net replacement rate, ***UI*** and ***UA*** that are the subscripts refer to the insurance and assistance, and ***i*** denotes the type of unemployed in insurance. The share of people who are not entitled to any UI or UA is ignored.

The indicator is the sum, not weighted by the share of people in category i, of the different benefits that an unemployed person is eligible to receive, with respect to the previous labour earnings. The index gives the measure of the maximum potential support to those people who reaches the criteria.

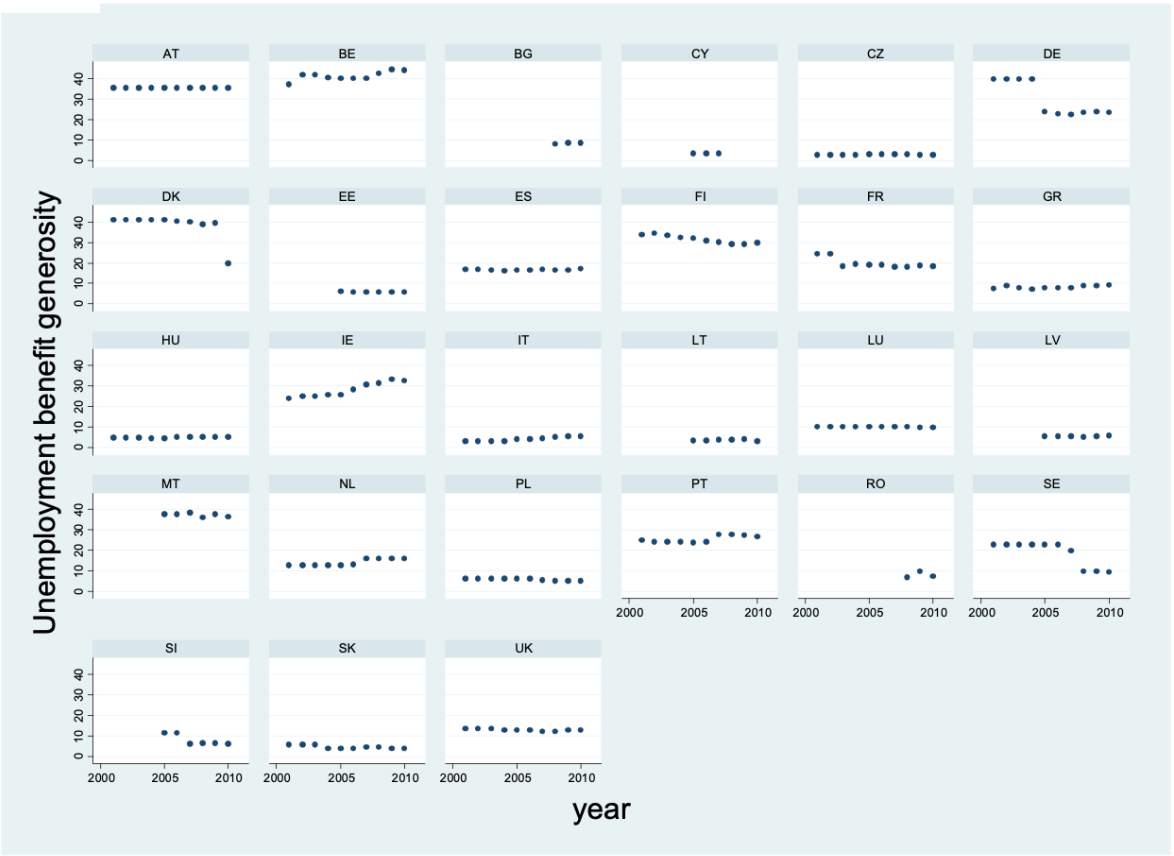
Different parameters are taken in consideration according to the European Commission-OECD Tax and Benefit project. All considered, we always have to keep in mind that does not exist a synthetic indicator that can measure cross-country differences on labor market and job search condition.

The benchmark of the generosity of unemployment benefits depends on different factors, such as the risk of disincentive on search of job, the provision of sufficient income support or the fiscal constraints, and it is predicted from a cross-country regression on:

- Real GDP per capita: if higher, the demand for income support is stronger.
- Government budget balance: if there is a surplus, there should be more benefit on unemployment system
- Expenditures on activation policies: if the activation policies is efficient and there is a strict condition on job search, there will be a more efficient and generous unemployment benefit system
- Unemployment rate: if the unemployment is high there are less possibilities to find a good match on labour market and larger pool of unemployed means less generous protection
- Long term on employment rate: the longer is the unemployment period, the higher the risk of benefit dependence.

In figure 2.5 are shown the results of the analysis, it is the evolution of unemployment benefit generosity from 2000 to 2010 in the different European countries. It is possible to understand that the generosity varies a lot across the EU, we also argue that it is quite stable, and that the variation are caused by major reforms.

Figure 2.5 **The evolution of unemployment benefit generosity over time**



Chapter 3: Correlation between Mental Health and Unemployment

After having analyzed the importance of the topic in chapter one, considering the cost of mental health and described the unemployment benefit system in the EU, in this chapter we want to focus more on the relation between those two variables. Going through the literature we will see also the relation between unemployment, mental health and unhappiness. In this chapter we also consider the happiness that is a self-reported variable. We want to take an overview of this, for an informative and completeness matter.

3.1 Unemployment, Unhappiness and Mental Disorder

There is strong empirical literature about the impact of unemployment on life satisfaction and happiness, and findings (Winkelmann 2014) show that taking up a new job increases happiness more than the unemployment benefit. It has been demonstrated also that if the mental disorder is higher the unemployed is also less effective in the research of job.

Literature shows also that more generous unemployment benefit, not always improve happiness, this because income replacement has a marginal effect on life satisfaction, this the first difference from mental health, and another aspect consider that policies can fail if they are not linear and costless for the unemployed.

From the paper on Happiness and Unemployment (Winkelmann 2014) evidence shows that the risk of disincentive due to unemployment insurance generosity is quite unfunded because the unhappiness caused by the unemployment is a larger incentive to research and take up job. The other result that interests us more is about the unemployed who strongly feels his unemployment, or who starts feelings psychological problem like stress or anxiety. These people are those about we want to focus on, because they have more difficulties to find a new job, and for that reason are the major part of the "indirect costs of unemployment".

Other literature, through National Health Surveys, explains that due to the Great Recession and the consecutive unemployment deteriorated unemployed mental health (Farré, 2018). Keeping in mind that those analyses are correlations, and this means that they don't give us the direction of causality we can just say that poor mental health and unemployment are correlated, we cannot say if it is due to mental disorder that people have lost their jobs or otherwise due to the loss of job people show mental disorders.

Different empirical works documented that the closure of some firms or the job losses increased the use of sickness benefits (Rege et al.2009), and contemporarily the Spanish National Health Survey registered an increase of drugs and alcohol use, those events are exogenous sources stronger enough to consider the unemployment entry rate and job losses related to the variation of workers' health. Other studies demonstrated the high risk of mortality for people with mental disorders who lose their job (Sullivan and von Wachter 2009).

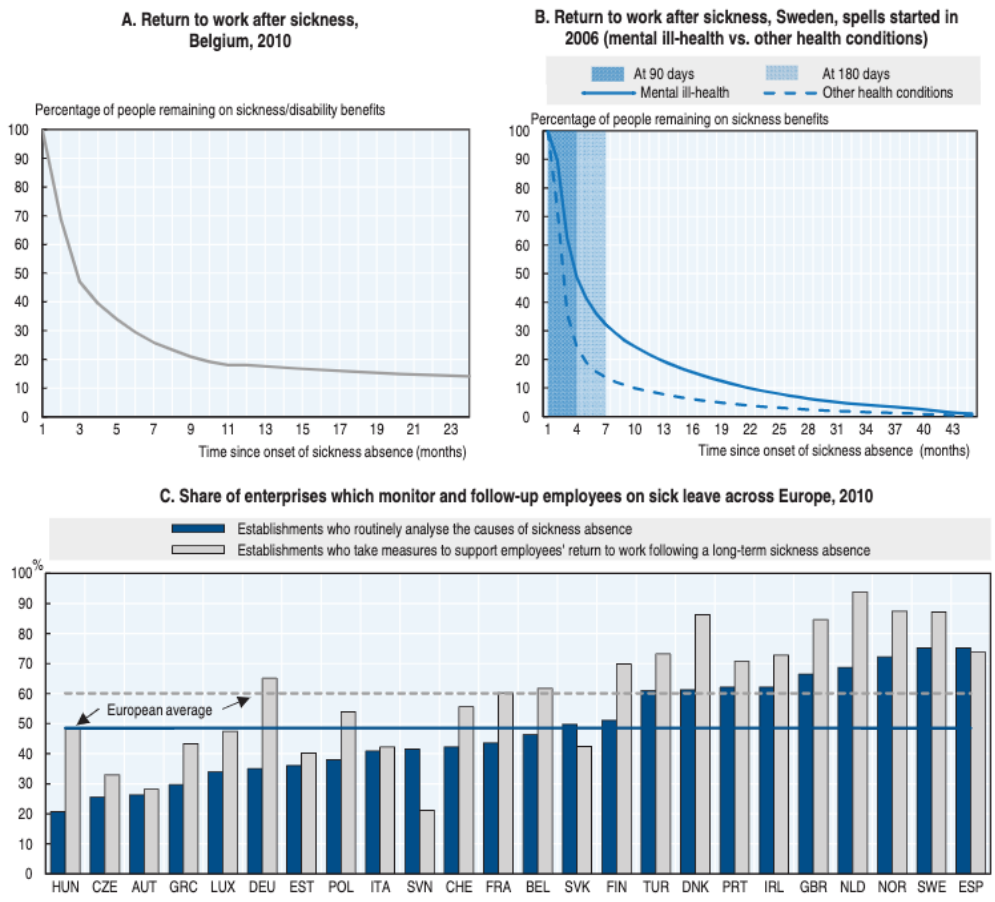
From those results in the next paragraph, we will go deeper on the relation between mental disorders and unemployment.

3.2 Mental disorders and Labour

Production is strictly related to mental health (Layard, 2013) and the consequence about that is that people with mental health problems are economically less productive and less efficient, that impacts on earning, and financial stability. Another paper (Bubonya et al., 2019) starts from the assumption that labour market difficulties and consequently job losses reduce mental health and once people cannot find a good matching on labour market, or a meaningful work, experience a decrease on mental health.

From this assumption it is clear that social health policy problems can vary according to the typology of policies governments implement. This means that if they follow labour market events or if they precede those. The most common mental disorder is depressive disorder, and it doesn't prevent people to work, in fact numbers show that the majority of people with mental disorder works. Even if those with mental disorder have higher unemployment rate and they are less productive. The problem of unproductivity is related to the fact that the majority of those disorders are not diagnosed and for that reason they are not treated (OECD, 2014).

Figure 3.1 **Return to work becomes difficult after three month's sick leave**



Note: Panel A: The National Institute for Sickness and Invalidity Insurance has only information on the sickness absences for which the mutualities pay sickness benefits, i.e. after the guaranteed wage period. To provide a consistent picture across blue-collar and white-collar people, the vertical axis shows the number of people receiving sickness or disability benefits as a percentage of the number of people receiving sickness benefits for at least one month. However, the time since onset of sickness absence (horizontal axis) includes the guaranteed wage period. The outflow curve is constructed on the basis of the duration of sickness benefits (first twelve months) and disability benefit outflows (from the thirteenth month onwards) for 2010.

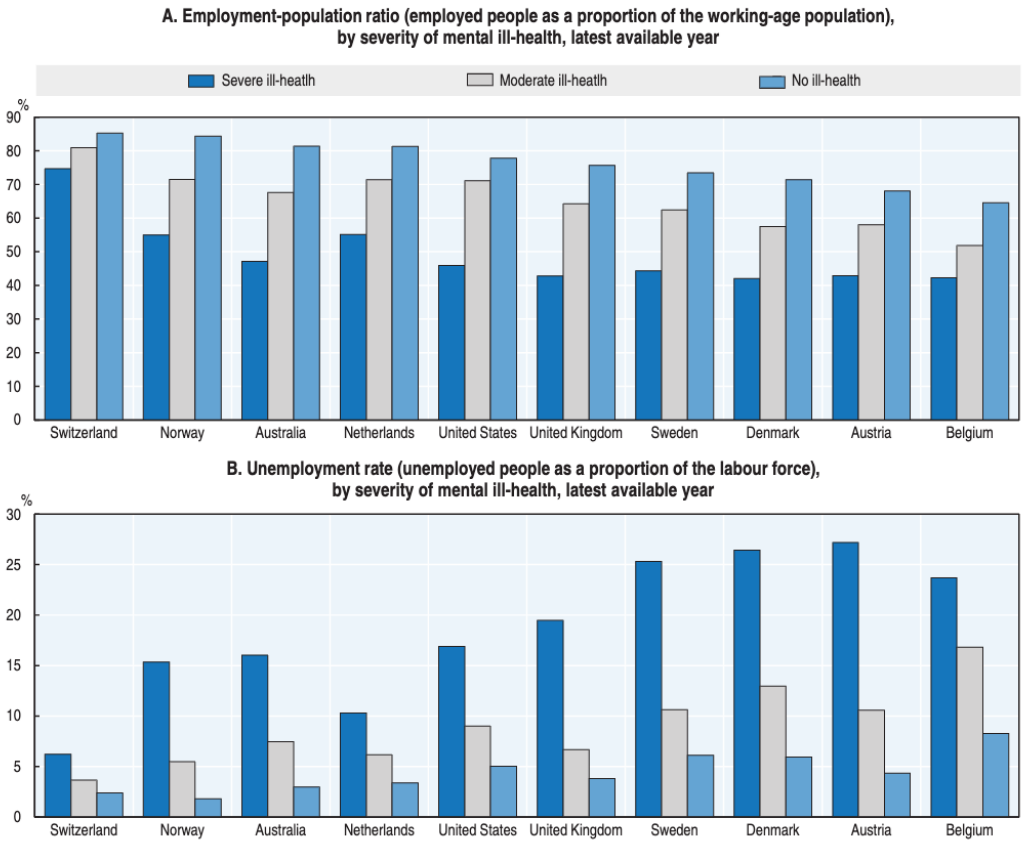
Source: OECD calculations based on: Panel A: Data from the National Institute for Sickness and Invalidity Insurance; Panel B: Data provided by the Swedish Social Insurance Agency; and Panel C: The European survey of enterprises on new and emerging risks (ESENER) of the European Agency for Safety and Health at Work; https://osha.europa.eu/sub/esener/en.

StatLink http://dx.doi.org/10.1787/888933184192

In figure 3.1 it is shown the return to work after three months' sick leave in Belgium in 2010, and in Sweden in 2006. We can see that a part of people remains in sick leave even after three months. It is always more and more difficult to come back to work after a long period of weakness.

Different empirical outcomes evidenced that labour conditions affect mental health, and after those researchers (McKee-Ryan, 2005) focused on the job loss and the impact on mental health, the results about that show that the effect is moderated by different variables, such as age, occupation, gender and macroeconomic climate. However, all the empirical literature agrees about the difficulties on prove the direction of causality, this because "The debate around the direction of causality between health and employment status requires re-examination through a longitudinal analysis that captures changes in mental health and employment transitions, as only then will we be able to comprehend whether a change in mental health precedes or follows a change in employment." (Dawson et al., 2015, 51). Our analysis will be focused more on demonstrate the correlation between unemployment rate, unemployment benefit generosity and mental health at the aggregate level, because due to the lack of data we have to consider only aggregate data.

Figure 3.2 **Employment and unemployment gaps are considerable for people with mental ill-health**



Source: National health surveys. Australia: National Health Survey 2011-12; Austria: Health Interview Survey 2006-07; Belgium: Health Interview Survey 2008; Denmark: Danish National Health Survey 2010; Netherlands: POLS Health Survey 2007/09; Norway: Level of Living and Health Survey 2008; Sweden: Living Conditions Survey 2009-10; Switzerland: Health Survey 2012; United Kingdom: Adult Psychiatric Morbidity Survey 2007; United States: National Health Interview Survey and 2008.

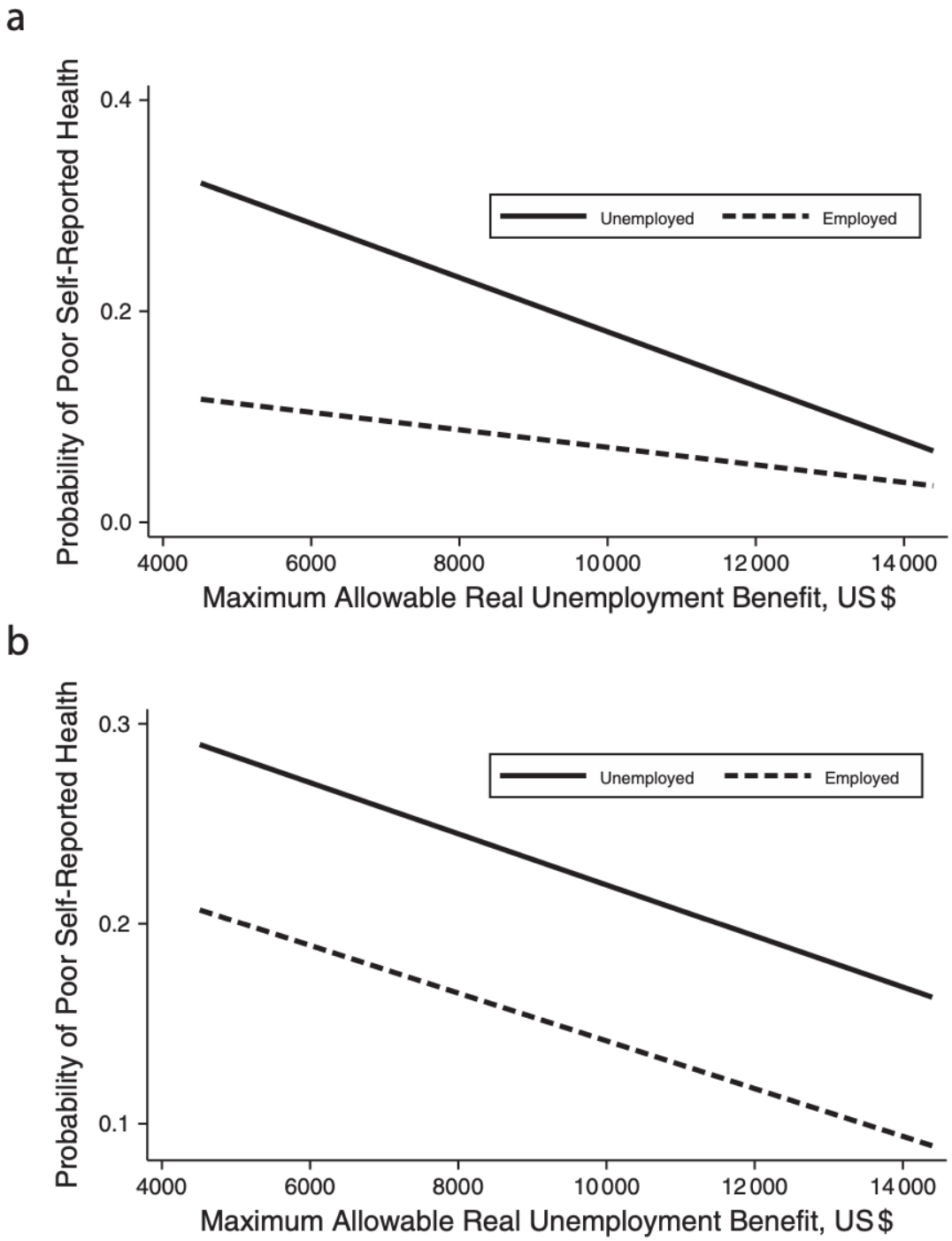
StatLink http://dx.doi.org/10.1787/888933184017

In figure 3.2 it is possible to see the gap between people with mental disorders. We can see that people with severe illness tend more to be unemployed than people with no mental disorders. In the next paragraph we will focus on the impact of unemployment benefit on happiness, this because in our analysis we don't want to see only the relation between unemployment rate and mental health but go deeper on the analysis of the unemployment benefit generosity and its impact on mental health.

3.3 Impact of Unemployment benefit on mental health

Literature (Cylus, 2015) on the impact of unemployment benefit generosity on the mental health of unemployed is focused mainly on U.S. and results show that unemployment benefit alleviates the negative effect of unemployment, in fact, the effect is lower when the generosity of unemployment benefit is higher. The aim of this work, as the aim of different researchers is to understand the impact of different policies on social issues, in particular for that case, we want to see the relation between the unemployment benefit generosity and the mental health. We have to consider that unemployment means first of all the loss of income, and subsequently means the progressive loss of time structure of the day and a relatively healthy routine. Few studies found that people who did not receive benefits show poorer health than employed workers. This association, between benefits and health is most pronounced among low-skilled unemployed workers, who benefit more from the receipt of unemployment benefits. Different findings from studies during the Great Recession, have shown that selections are an important source of possible bias when we are speaking about relationship between health and unemployment benefit, and the direction of the bias is not clear (Cylus et al., 2015). Other findings from Cyrus et al. have shown that to a more generous unemployment benefits should be aggregated a weaker effect of economic crisis on suicide. However, like this work, those findings are reached with aggregated data. This means that it cannot explain all the effects, and at the same time, it cannot consider the impact of unemployment on health at the individual level.

Generous unemployment benefit systems could improve health because it could be considered as a safety network against the job loss, and it could reduce the stress of losing job due to labour market crisis; however, this typology of assumption benefits both unemployed and employed people. About self-reported health surveys, it is explained, as we can see in figure 3.3, that in countries with more generous unemployment benefit, considering the job loss, people report higher health instead of in those countries where unemployment benefit is less generous. This because related to the unemployment benefit, there are other considerations like the social isolation, the reduction of "meaning of life" and the stigma. The higher amount repays in part the social blame and the stress related to the job loss. According to the Cylus paper it is shown that the generosity of unemployment benefit could smooth consumption and at the same time influence health during unemployment. This because a more generous unemployment benefit could protect health in two ways, more financial resources, and that the same time the unemployed have more time to spend in his hobbies and promoting health activities.



Note. Data are from the Panel Study of Income Dynamics[23] and US Department of Labor Employment and Training Administration.

Figure 3.2 –Probability of poor self-reported health relative to maximum allowable real unemployment benefit levels, unemployed and employed US workers, among (a) men and (b) women: 1985–2008.

Another aspect to consider is that literature (Cylus, 2015) considers mental disorder a possible consequence of unemployment, this due to the fact that the unemployed person loses his social position and for some people also their aim of life. At the same time, we have to consider that

the person loses its paid work and for this reason also its credibility and possibility to keep its life's tenor. And this means that more generous unemployment benefit can help on the reduction of mental health.

Considering the fact that I have only aggregate data I can focus my research question and analysis on the cost of mental health for a state and consider if there is a correlation between unemployment benefit generosity and mental disorders, in particular analysing if the reduction of diseases thanks to the unemployment generosity is consistently helpful for mental health. In the next part, there will be explained the variable of the analysis and the model.

Second Part: Empirical Analysis

Chapter 4: Description of Variables, Model, Results and Limits

In this part of the work, we will discuss the variables chosen and the model we want to focus our analysis. I have only aggregate data, so in the analysis I will consider if there is a correlation between unemployment benefit generosity and mental disorders. Going further, we want to analyse if the reduction of diseases thanks to the unemployment generosity is consistently helpful for mental health.

In the first paragraph of this chapter, we will list all the variables we use in the model, their description, and why we have focused on those variables. In the second paragraph, instead, there will be shown the model with the typology of analysis and the econometric instrument we want use. At the end, we will argue about the results and the limits of the analysis.

4.1 Choice of variables

We can divide the variables of this analysis into two main part: the economic or macro-variables and the variables related to well-being and mental health. I would like to use *mental health* instead of subjective well-being or happiness variable because obviously it is quite hard to define exactly people well-being, but at least mental health is more objective than asking people if they are happy or not, in fact the "Problem" with indicators like happiness or SWB, as we said in the previous chapters, is that those indicators are biased in different ways.

First of all, some analysis (Kruegel, Schkade, 2008) have shown that subjective well-being measures are biased from different factors like weather, the status of a person, the period of the week or of the month in which the survey is made. For that reason I decided to use mental health to investigate if there is correlation between the unemployment benefit generosity and the prevalence of mental disorder.

The dataset I have composed, consists of some variables like the name of the country, the country code, and the year, that are variables used as indicators of the values that interest us, then we can divide our dataset into two main sectors, the health sector and the macroeconomic sector.

The variables are taken from the Eurostat and from the National Statistical Databases of all the 27 European countries, this because we will analyse the impact of unemployment benefit generosity on mental health in European states. And the time we consider is from 2008 to 2018, so we have 297 observations.

From the **health point of view** the variables we will use in this analysis are:

MD: this is the incidence of mental disorders, the percentage of people active in labor market. In the analysis, we will use it because in that case the distribution has got a better behavior, with the reduction of potential extremes in data and decrease the impact of outliers.

From the **macroeconomic sector**, instead we have different variables:

Unemp_rate: it is the short-term unemployment rate, it is the rate of people that are active in the labour market, but that are unemployed. Unemployed persons are defined as all persons who were without work during the reference week, were currently available for work and were either actively seeking work in the last four weeks or had already found a job to start within the next three months. The unemployment period is defined as the duration of a job search, or as the length of time since the last job was held (if shorter than the time spent on a job search). The economically active population comprises employed and unemployed persons.

GDP: this is the Gross Domestic Product, and it gives us the possibility to understand how rich a country is.

UnempBen: the unemployment benefit generosity, is the benchmark we described in the second chapter, it is given from the European Commission, and this is at the basis of our research question, because we want to see if it has an impact on mental health.

4.2 The model

As we said before, the aim of my work is to analyse if there is a correlation between the unemployment benefit generosity and the number of people with mental disorder. Therefore, to analyse the possible correlation we start with a simple pooled OLS, after this analysis, we go further with a fixed effect estimation, and, at the end, we try to compare this analysis with first difference estimation. In the analysis we will use the log GDP to get an approximate percentage effect.

These models try, in an econometric way, to answer the research question, in fact I'm using the core variable of the thesis: the number of people with mental disorder, the log GDP, that considers the condition of the country; if a country is rich or poor; the Unemployment Benefit Generosity and the unemployment rate.

The first regression I run, is the **simple pooled OLS**. According to Wooldridge (J.F. Wooldridge, 2012) pooling is helpful only if the relationship between the dependent variable and at least some of the independent variables remains constant over time. The base year, running a pooled OLS with years dummy variables, is 2008. The model will be:

$$Mental\ Disorder_{it} = \beta_0 + \beta_1 logGDP_{it} + \beta_2 Unemp\ Ben_{it} + \beta_3 UnempRate_{it} + a_{it} + u_{it}$$

The reason why we pool the OLS is to have the possibility to increase the sample. In fact, in that way we can observe the sample for a long period, and we have more observations. Using the simple pooled OLS raises minor statistical complications.

After that, considering that we have a panel data we need to run another regression with **country and year fixed effect**, this means that we will do a fixed effects transformation (or within transformation). We will use the time-demeaning on each explanatory variable and run the pooled OLS, and our model will be:

$$\ddot{Mental\ Disorder}_{it} = \beta_1 \ddot{logGDP}_{it} + \beta_2 \ddot{Unemp\ Ben}_{it} + \beta_3 \ddot{UnempRate}_{it} + \ddot{u}_{it}$$

The last model we will consider during the analysis is the first difference to avoid bias due to unobserved effect. Estimating the **first-differenced** is an efficiency matter, in fact we want to also remove the autocorrelation problem.

We use the difference between years our sample to estimate the model, in this way we will have different equations that form our first-differenced model:

$$y_{i2} = (\beta_0 + \delta_0) + \beta_1 logGDP_{i2} + \beta_2 UnempBen_{i2} + \beta_3 UnempRate_{i2} + a_i + u_{i2} \quad (t = 2)$$

$$y_{i1} = \beta_0 + \beta_1 logGDP_{i1} + \beta_2 UnempBen_{i1} + \beta_3 UnempRate_{i1} + a_i + u_{i1} \quad (t = 1)$$

[…]

In which a_i is the unobserved effect. The most important assumption that is satisfied in this model is that Δu_i is uncorrelated with the different variables. This assumption handles only if the idiosyncratic error at each time is uncorrelated with the explanatory variables in both time periods.

Our new model will be:

$$\Delta Mental\ Disorder_{it} = \beta_0 + \Delta\beta_1 logGDP_{it} + \Delta\beta_2 Unemp\ Ben_{it} + \Delta\beta_3 UnempRate_{it} + \Delta u_{it}$$

Thanks to these models we can observe and analyse if the independent variables are correlated with the number of people with mental disorder, and if it is so, in which way. Is it a positive or negative regression? And at the same time, we run an always more critical analysis testing for autocorrelation.

4.3 Results and Limits of the analysis

In table 4.1 we can see the first results of the pooled OLS with years dummy variables. We can see that the independent variables are statistically significant.

Table 4.1 Determinants of Mental Disorders

Dependent Variable:	Mental Disorders	
Independent Variables	**Coefficients**	**Standard Errors**
LogGDP	-11.83***	1.795
Unemp_rate	-.0408	.135
Unemp_Ben	-1.356***	.313
y09	1.21	2.274
y10	1.07	2.297
y11	1.25	2.295
y12	.83	2.314
y13	1.57	2.325
y14	.36	2.307
y15	.67	2.289
y16	.08	2.271
y17	-.91	2.259
y18	-.92	2.253
constant	91.97	8.297

n= 297
R^2= 0.3708

In the following table (Table 4.2) are shown the different results from the previous models. From the pooled OLS below we can say that there is a relation between variables, the limit of the analysis in this case is that we cannot affirm that an increase of the Unemployment benefit generosity can affect the number of people with mental disorders and vice versa.

From this regression we can see that the coefficient of the logarithm of GDP and the coefficient of the Unemployment benefit generosity (Unemp_Ben) are statistically significant, and both of those are negative. From the pooled OLS and the fixed effects model, we can affirm that there is a negative correlation between the Mental Disorders and the richness of a nation, and at the same time a negative relation between mental disorders and the unemployment benefit generosity of a country.

The fixed effect model gives us similar results.

Table 4.2 Correlation of Unemployment benefit generosity and Mental Disorder

Dependent Variable: MD

Independent Variables	**Pooled OLS**	**Fixed Effects**	**First-differenced**
LogGDP	-11.74***	-11.83***	6.485
	(1.76)	(1.79)	(4.840)
Unemp_rate	.007	-.040	.017
	(.126)	(.135)	(.097)
Unemp_Ben	-1.34***	-1.36***	.142
	(.308)	(.313)	(.259)
Constant	91.55	92.44	-.187
	(8.07)	(8.27)	(.153)
Observations	297	297	297
R-squared	0.365	0.368	0.0145

From table 4.2 we can also say that keeping all the other variable constant, a positive variation of 1 point percentage in log GDP can reduce mental disorders of 11.74 points. And considering the statistically significance of the coefficient of the unemployment benefit generosity we can use the same approach. Keeping all the other variables constant, a positive variation of the unemployment benefit generosity will reflect a reduction in mental disorders of -1.34.

There are substantial differences between the first two models and the last one, in fact the differencing used to eliminate a_i(the unobserved effect) reduced the variation of the explanatory variable.

In this empirical analysis we have seen the results of three different models that try to answer our research question, and that try to estimate the unobserved effect. The fixed effect involves time-demeaning, instead the first-differenced involves differencing data.

With more than two periods we have seen that the results of the model are different. We know from the assumptions that FE and FD are both consistent, and the choice of the two models is strictly related to the relative efficiency of the estimators, that is determined by the correlation in u_i. If the unobserved effects model is referred to the uncorrelated idiosyncratic error, normally, the FE estimator is used more that the FD estimator. But the fixed effects estimator can be very sensitive to classical measurement error.

In this case, considering that we have substantial different results is quite difficult to decide which one gives us the best analysis. The most important and useful thing is trying to understand why they differ so much. In fact, we know that both are unbiased estimators, and are consistent. At the same time, fixed effect works better when N→ ∞, instead in our sample we have only 27 countries.

The main limit of this analysis is the use of aggregate data. And, meanwhile, the possibility to establish the correlation and not the causation but considering the typology of analysis is very difficult to find other results. This because proving the causation is hard due to the unobserved effect or even more, the missing variable. We could consider one variable direct consequence of another but missing some other essential explanatory variables.

Conclusion

To conclude this work, we understood, thanks to literature, that mental disorder is a possible consequence of unemployment, this due to the fact that the unemployed person loses his social position and for some people also their aim of life and that the person loses its paid work and for this reason also its credibility and possibility to keep its life's tenor. And this means that more generous unemployment benefit can help on the reduction of mental health. This because a more generous unemployment benefit could protect health in two ways, more financial resources, and that the same time the unemployed have more time to spend in his hobbies and promoting health activities. From a little focus on the countries with the highest and the lowest unemployment rate, it has been shown that countries with higher unemployment rate spend more on Unemployment benefit than countries with lower unemployment rate. We know that tens of millions of people had at least one mental problem, and that tens of thousands die each year due to this problem, or due to problems related to that.

We also know that taking up a new job increases happiness more than the unemployment benefit. It has been demonstrated also that if the mental disorder is higher the unemployed is also less effective in the research of job; and more generous unemployment benefit not always improve happiness, this because income replacement has a marginal effect on life satisfaction; and another aspect consider that policies can fail if they are not linear and costless for the unemployed. Moreover, the risk of disincentive due to unemployment insurance generosity is quite unfunded because the unhappiness caused by the unemployment is a larger incentive to research and take up job.

We can say that we cannot completely answer to our question. In fact, due to aggregate data, and the difficulty in reaching all the data we have, of course, empirical evidence of the correlation between people with mental disorders and the unemployment benefit generosity but country-level data means that, what we will find, cannot be considered at the individual level. We work at country level. Fortunately, there is strong literature about the relation between unemployment and mental health, or at least happiness as life satisfaction and we can argue that people with severe illness tend more to be unemployed than people with no mental disorders. Moreover, we know that there is also empirical evidence that people with mental disorder show a decrease of the illness after finding work and it is true the opposite that it is more common to see mental disorder, in particular depression disorders, among people who have lost their job.

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