Three Essays in Labour Economics

André Gama Nogueira

Thesis submitted for assessment with a view to obtaining the degree of Doctor of Economics of the European University Institute

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European University Institute
Department of Economics

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I confirm that chapter 1 was jointly co-authored with Mrs. Catherine Saget and I contributed 75% of the work.

I confirm that chapter 3 draws upon earlier work I published in the *report Inventory of Labour Market Policy Measures in the EU 2008-13: The crisis and beyond* at the International Labour Organization (ILO).

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Abstract

This thesis investigates labour market policies and the way they interact with labour market frictions.

The first chapter of this thesis is dedicated to the introduction of a new method to measure skills mismatch in the labour market. By introducing a new index that uses employment distribution across sectors to measure labour demand and education distribution of unemployed workers, this new index reproduces some of the more relevant results in the literature. Given the nature of the index, the chapter can calculate it for as much as 74 countries per year. The results point to significant differences among men and women, and between high income and non high income countries.

Chapter two studies the relationship between the business cycle and unemployment benefits policies. Using US states as case study, it deploys several tools in order to understand: (i) whether unemployment benefit policy variation across states are related with differences in states' business cycles; and (ii) in which direction such relationship might work. The results show that the maximum level of unemployment benefits is the main tool states can use to influence both the actual level of unemployment benefits received. Because of that, it is also the variable concerning the unemployment insur-

ance scheme that co-moves with business cycle moments more often. The last section of the chapter provides evidence that in fact, policy decisions regarding unemployment benefits are influenced by business cycle moments. In particular, states where the labour market is more volatile implement lower maximum limits to unemployment benefits.

The last chapter estimates the impact that policies that facilitate dismissal procedures have on unemployment flows in European Union member states. The results suggest that in the aftermath of the crisis, such policies lead to higher inflow rates into unemployment, without a discernible effect on outflow rates. Conversely, before the crisis the evidence produced in the chapter points to a significant positive effect in outflow rates from unemployment, without no clear/significant impact on inflow rates.

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My parent's undying support is something that goes beyond all words,

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To my brother, for sharing with my my whole life with me. For being there for everything. For all the tough moments, but specially for all the summers and rock n'roll.

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Preface

Shelter line stretchin' 'round the corner
Welcome to the new world order
Families sleepin' in their cars in the Southwest
No home no job no peace no rest.

The highway is alive tonight
But nobody's kiddin' nobody about where it goes
I'm sittin' down here in the campfire light
With the ghost of old Tom Joad

now Tom said:
"Wherever there's somebody fightin' for a place to stand
Or decent job or a helpin' hand
Wherever somebody's strugglin' to be free
Look in their eyes Mom you'll see me!"

The Ghost of Toam Joad, Bruce Springsteen

The Great Depression. It was the most severe economic depression ever recorded worldwide . For years and years it was the greatest depression. A time of jobless despair that lasted almost a decade. A time that most hoped would never repeat itself.

That was until 2007-08, when a new financial crisis sank the world into the worst global recession of the post WW II period. Once again the roads were filled with ghosts with no jobs, people struggling for a place to stand, men looking for a decent job, families in need of a helping stand. It's in times like these that the role of policy makers becomes more important than ever. Can they measure the struggles? Can their helping hand reach the ghosts on the railroad tracks? It is this yearn for hope, this need for peace, and the struggle to reach those in need that motivate this thesis.

The first chapter of this thesis is dedicated to the introduction of a new method to measure skills mismatch in the labour market. The methodological approach allows the chapter to calculate the index to as much as 78 countries per period. Although it being a relatively simple method, it is still able to reproduce some of the stylized facts in the literature. It's this twofold nature of the index that is its main contribution: it presents a novel way to measure skills mismatch that, due to its low requirements in terms of data allows it to be easily calculated for a wide array of countries. This brings an important contribution to the literature, as it allows the analysis of skills mismatch in the labour market to go way beyond developed countries, which are the object the vast majority of the research in the field.

Chapter two studies the relationship between the business cycle and un-

employment benefits policies. Using the US as case study, it deploys several tools in order to understand: (i) whether unemployment benefit policy variation across states are related with differences in states' business cycles; and (ii) in which direction such relationship might work. The results show that the maximum level of unemployment benefits is the main tool states can use to influence both the actual level of unemployment benefits received. Because of that, it is also the variable concerning the unemployment insurance scheme that co-moves with business cycle moments more often. The last section of the chapter provides evidence that in fact, policy decisions regarding unemployment benefits are influenced by business cycle moments. In particular, states where the labour market is more volatile implement lower maximum limits to unemployment benefits. This chapter looks to contribute to the literature on optimal unemployment insurance policy along the business cycle by taking a step back and investigating if policies don't already depend to some extent on the business cycle. The findings that indeed unemployment benefit policy is influence by business cycle moments is important as it strengthens the knowledge of the relationship between unemployment insurance schemes and the business cycle.

Chapter three is dedicated to investigating the impact that policies that change the legal framework that governs workers' dismissals by firms have on unemployment flows. Focusing in European Union member states, in the period between 2000 and 2008, the chapter finds two main results. First, before the crisis there is some evidence of a positive impact of such policies in job creation, without any clear evidence of a significant impact on job destruction. And second, in the aftermath of the financial crisis, this situation was

reversed. Policies that facilitated dismissal procedures had no positive impact and job creation, but lead to higher job destruction rates. These results are significant as they show that these policies' effects have different effects around business cycles. Because of that, policy makers should be cautious in implementing such policies in recessionary periods, as it has happened in many European countries after the 2007-08 crisis.

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Chapter 1

Measuring skills mismatch in the labour market: a new approach

with Catherine Saget

"They offered me the office, offered me the shop
They said I'd better take anything they'd got
Do you wanna make tea at the BBC?
Do you wanna be, do you really wanna be a cop?

Career opportunities are the ones that never knock
Every job they offer you is to keep you out the dock
Career opportunities, the ones that never knock"

Career Opportunities, The Clash

1.1 Introduction

Mismatch between the level of skills demanded by firms and the skills profile of workers and jobseekers is a phenomenon observed all around the world. This mismatch can have diverse causes and his under constant mutation. On the supply side, globalization leads to constant changes on job profiles, driven by continuous technological progress and an increasing openness do trade by most economies. Labour demand is also far from being stable from a skill point of view, particularly given the trend over the last decades towards higher levels of education attainment. With such dynamic and widespread frictions in the labour market, it is essential for all agents in the labour market (firms, workers and policy makers) to be aware of the degree to which their labour markets suffer from such frictions.

This chapter contributes to the literature by introducing a new method to measure skills mismatch. This index is able to replicate trends identified in the literature, but is also designed in a way that allows it to be calculated for a vast number of countries - in the year with the greatest number of observations the index is computed for 74 countries .

The skills mismatch between labour demand and labour supply can assume different forms. If the growth of educational attainment levels is not accompanied by a similar change in the job profile in the economy, there will be an excessive supply of over qualified workers. This type of mismatched - often classified as over education - can steam both from: (i) the qualification of unemployed workers being higher that the skill level requested by firms on posted vacancies; or (ii) employed workers have qualifications superior to that demanded by the job they are currently employed on. The opposite case

is also observed in several cases, with jobseekers having a skill level below that that is asked by employers.

It is important to understand that all variations of skills mismatch can have a negative impact in the labour market and the economy. When workers' skill level is above that of the job they are hired for, this means that the firm is underutilizing that worker, and hence not taking advantage of all their productive capacity. The same outcome might also derive from the converse scenario: if firms employ workers who are under educated for the job they are performing, it means that firms' output will be further away from its productive frontier. The impact of mismatch on productivity and wages has been the topic of works such as Iriondo and Perez-Amaral (2013), Lamo and Messina (2010) or Allen and van der Velden (2001), among others.

The different types of mismatch and the various channels through which they can affect economic performance have important policy implications. A country with an undereducated population should perhaps considered increasing investment in education in order to improve its workforce's fit to labour demand. On the other hand, a country with a certain level of overeducation should focus its policies on improving the skill profile of the jobs in the economy. The problem of "overeducation" can be sometimes misspecified as well. It can be that a country where there is an excess of supply of workers with a university degree has a shortage of workers with and education more geared towards vocational training. In such a case, there is more of a excess of the focus on on type of education, rather than an excess of education or of highly educated workers per se.

Given these issues, it is essential that all labour market actors - policy

makers, employers and workers alike - work towards guaranteeing the skills required by firms are properly matched by workers. This is can be through adequate education systems and training programmmes that compliment the education system in order to ensure that workers' profiles match those required by the economic which they are a vital part of.

The relevance of the concept of mismatch is further underlined by the fact that the equilibrium unemployment model more widely used by economists, the Diamond-Mortensen-Pissarides model is usually referred to as the Search and Matching model. In this type of model, a matching function is used to match potential employers (job vacancies) with potential (unemployed) workers. In this sense, the two parts of the model (i.e labour supply and labour demand) are connected through this function that one can easily see as the inverse of mismatch: the more efficient the matching function is, the less mismatch there is in the model/economy. In the standard Cobb-Douglas formulation of the matching function, it includes a matching efficiency parameter, which in cases where it can be estimated, can be seen as a inverse measure of mismatch in the economy, in the same broader sense of the index developed in this paper.

Other important strand of the literature focus on studying under and over education issues. This chapter distances itself from the concepts of over and under education by assigning the same weight to both phenomena, making them equally important in our measure of skills mismatch by construction. This does not mean that the importance of over and under education is in any sense discarded or ignored. The literature in this topic is vast[1] and their

[1] See Groot and van der Brink (2000) or Leuven and Oosterbeek (2011) for surveys on

implications very important. Still, this chapter adopts a broader concept of mismatch.

But what exactly should be understood as mismatch? Broadly speaking, one can state that we are in presence of skills mismatch whenever the characteristics that an employer requires for a particular job position are not entirely met by the worker who was hired for that position. These characteristics can be of various orders, although most literature has focused on either spatial or skills mismatch. The definition above, albeit being quite precise, takes a micro perspective when looking at mismatch that can hardly be the basis for policy making decisions in most circumstances. This follows from the complications of skills mismatch measuring.

In order to overcome these issues, several alternatives have been proposed in the literature, particularly when it comes to overeducation.

For instance some studies use job analysis, which consists on the systematic evaluation of a job and required education/skills for it, and subsequent comparison with the education/skill level of the worker associated with that job to measure mismatch. However, performing such assessment for a representative sample of the workforce can be a very demanding (not to mention expensive) task, and hence few countries have undertaken it, making it a suboptimal approach for a chapter that is aiming at expanding its analysis to a wide and heterogeneous set of countries.

Another alternative proposed by some authors is to measure mismatch based on workers' assessment of their own mismatch. But this method has its issues as well, since results can be tainted by workers' bias and questions may

the literature on overeducation.

be posed in different ways across countries, making cross country comparisons complicated.

A third alternative, and one that relates more to our work, is based on calculating the mean/mode of existing jobs education/skills level. A mismatched worker is then defined as a worker whose skill/education level is more than a standard deviation away from the mean/mode.

The goal of this chapter is to identify the level of skills mismatch in the labour market, and consequent need (or lack of thereof) to change or maintain the structure of the educational and training systems. With data requirements that are not as demanding as in more structural works in the literature, the index proposed by this chapter allows future literature to expand the debate and discussion of the role of mismatch in employment and unemployment dynamics to countries all around the world. The hope is that this first step can be a stepping stone for further research willing to take what is today the standard approach to labour market issues (be it from a microeconometric point of view, or a more structural macro approach[2]) to more countries, leaving the bubble in which modern economics seldom settle for where the only countries analyzed are developed (mostly in Europe and North America) countries. This would strengthen our knowledge of labour market dynamics and equip policy makers with better tools to measure labour market outcomes and frictions and to design better policies.

[2]Such as the search and matching literature for instance

1.2 Methodology

To understand the relevance and adequacy of the index proposed in this chapter it is important to understand the scope of this chapter. Its goal is to do a cross country analysis of labour market skills mismatch for the greater number of countries possible, in a consistent and comparable way. Therefore the way skills mismatch is measured must be not only conceptually accurate and consistent, but must also require data that is available for a vast number of countries, and that is comparable to a significant degree.

In order to measure labour supply's skill level, unemployed workers' qualifications are used as a proxy for their skill level. Workers are divided into three broad categories: (i) those with primary education or less; (ii) those with secondary education or lower (but above primary); (iii) and individuals with tertiary education (bachelor degree, equivalent degree or higher). After this division is performed,the share of each level of education on the overall unemployed is calculated, which will later be defined as $Unemp_{it}^{j}$, referring to the number of unemployed people in sector j, at country i, in year t.

Labour demand is often measured in the literature through the number of job vacancies in the economy. It is a particular valuable concept since these are in the vast majority the jobs which are available to job seekers. However, they only cover a part of the jobs in the economy, and most importantly in this context, data on vacancies is rather scarce across countries even at an aggregate level. For these reasons this chapter focuses on employment as the main tool to measure labour demand. In order to match the labour demand side of the data, the approach regarding skills measurement goes as follows. First data for the share of employment in each sector of the economy

according to the International Standard Industrial Classification[3] (ISIC) is collected. Then sectors are grouped into three broad categories: a primary, a secondary and a tertiary sector[4]. Hence, and going back to our labour demand measure, occupation are grouped into these three broader groups according to the predominant education level in the sector. So, for instance agriculture is assigned to the primary sector since most people employed in the sector have a low education level, whereas the financial sector is assigned the tertiary group, given most jobs in the sector require workers to have a bachelor degree or a higher level of education. This classification is of course open to debate, mostly because it is clear that there are people with different qualifications working in every occupational sector. However, using each sector as a whole is a potent tool in translating the skill profile of labour demand, both in the present and for its future trends: a sizable financial sector is a sign of a developed economy that has(or is moving towards) an average job profile requiring higher skills from workers. Hence this approach is to a large extent efficient in proxing for aggregate labour demand's skill profile.

There are some caveats within this approach that are worth mentioning. First, aggregating labour demand into three main sectors discards some of the potential that exists in the data regarding the distribution of workers across education levels within each sector. One could argue that defining a sector with 90% of the employment with primary education to the same group as a sector with 50% of workers with primary education is a strong

[3] http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27

[4] See Table 3.1 for each sector's classification according to this criterium

generalization, as this two sectors are clearly very different in their skill profile composition. Although this is a valid point, undertaking a more refined breakdown would imply one of two alternatives: a) creating a distribution of sectors with more than three options, which would require using distribution of unemployed population across more than 3 education groups, for which data is not easily available for a significant number of countries in the sample; or b) comparing each sector's employment distribution across education levels to the education level of unemployed workers. This second option has two main drawbacks: first, it leads to a sectoral analysis that strays away from the goal of the chapter which is to provide a measure of skills mismatch of the overall economy. One could argue that this sector by sector analysis could be easily aggregate into a single index, but this would make the index very similar to other measures of skills mismatch which use employed population's educational attainment as a measure of labour demand, to which the measure developed in this chapter aims at being an alternative too[5].

Having split both labour demand and labour supply into three groups, and after calculating each group's share of overall employment and unemployment, respectively, the index is computed according to the following formula.

$$I_{it} = (\sum_{j=1}^{3} abs[\frac{Emp_{it}^{j}}{Emp_{it}} - \frac{Unemp_{it}^{j}}{Unemp_{it}}])/2 \tag{1.1}$$

[5]For an extended review of other alternative methods to measure skills mismatch, see Johansen and Gatelli (2012)

where I_{it} stands for the Index on country i, in year t. The index is divided by two to make it bounded between 0 and 1. Although the index does not have a precise quantitative interpretation, its extreme values can be illustrative on how to interpret the index and its variations. The case of "total mismatch" can happen for instance when all employed workers are concentrated in two sectors and all unemployed individuals are concentrated in the remaining sector. In such a scenario of total mismatch, the index would assume value 1. On the other end of the spectrum, the absence of mismatch would be when both employed and unemployed workers would be evenly distributed across the three sectors for instance, in which case the index would assume value 0. Therefore, the higher the index's value, the higher the mismatch in the labour market (according to our definition).

Given the way the index is constructed and the data it uses, it is important to stress that there is no possibility of skills mismatch in a single sector sector driving the aggregate level of mismatch in the labour market. A country with a higher level of skills mismatch will have at least skills mismatch issues in two of its three sectors. Consider the hypothetical case of a country which has 50% of employment concentrated in the tertiary sector, but where only 10% of all unemployed individuals have higher education. This means that there will be, according to our index, 40% workers with lower qualifications in excess for the other two sectors, as they will comprise 50% of the country's employment, but 90% of its unemployed population will be associated to those sectors. This is a case where our index can be directly linked to a situation of under-education of the population: the fact that half the employment in the country is focused on high skilled industries, but only 10% of its unemployed workers

are qualified to take high skilled jobs means that there is a window for policy makers to intervene, and help reshape the labour force skills profile to the needs of the majority of its firms.

This last example is important because it highlights an important property of the index: any case of high skills mismatch in one sector will be reflected either in one or both of the other sectors. This is important because it avoids situations where the same level of skills mismatch measured with the index can be generated by two different situations: i) a situation with high level of skills mismatch in one sector, and little to no mismatch in the other sectors; and ii) a situation where there is moderate to little skills mismatch in each sector, but that when it is all summed up, it leads to a similar value of that observed for country in the situation described in i).

In order to calculate the index presented in equation 1.1, data from the Key Labour Market Indicators (KILM) of the International Labour Organization (ILO) was used. The size of the available sample is very significant. In the year when more countries are observed (2005), the index is computed for a total of 74 countries. From these 74, 36 countries have annual data from 2000 and 2008, allowing for a trend analysis of mismatch for that period. Moreover, the dataset allows the results to be broken down by gender, which adds an important dimension to the analysis.

Since applying the index to a vast number of countries was one of the primary goals of this chapter, one can say that on that respect the index is quite successful. Cross country comparisons rely on countries recording their labour force education and occupation levels in similar fashion. Although it is never possible to be completely sure about the comparability of each coun-

try's series, this is in our understanding the closest one can get to comparable data.

Cross-country comparisons should be done carefully however, as there are some conclusions that one cannot draw by simply comparing two countries' indices. This index should be used as a diagnostic tool, which needs further decomposition or the use of complementary techniques in order to prescribe any kind of solution to policy makers. More importantly, a relative high value of this skills mismatch index means the country has problem of skills mismatch in its labour force. That high value however does not necessarily imply that this is an under or over education issue, or in which level of education is there an excess or shortage of labour supply. Lastly, a low (or zero, in the limit) value of the index is not a sign of a healthy labour market: it is only an indicator of very low skills mismatch. There are other problems in labour markets that can be observed in the absence of skills mismatch nonetheless. For instance a country with a widely predominant agricultural sector will present a low value of skills mismatch if most of its population has a very low level of education. This is still however a country that most would agree has some severe issues in the composition of both its industry and its labour force. Hence, it is important to understand that this index is an important tool in assessing the scope for improvement regarding the distribution of skills in a labour market, but one that should be used with complementary sources of diagnostic before leading to policy recommendations or implications.

1.3 Results

This section of the chapter is divided in five parts: the first part focuses on the year for which more countries have available data (2005). The results are broken down by gender and countries' income level. The second part looks at the behaviour of the index between 2000 and 2008 for the countries that have available data for the full period (36). Part three studies the relationship between countries' expenditure in education and skills mismatch. The fourth section analysis each sector's contribution to overall mismatch. The last part is dedicated to the comparison between our results for the US and the UK and those by Sahin et al (2014) and Patterson et al (2013) respectively, in order to assess the effectiveness of the index at reproducing some of the results in the literature.

1.3.1 Cross-section analysis

In the year with more observations, the data available allows the index to be computed for a total of 74 countries[6].

[Figure 1.1]

Figure 1.1 presents the distribution of the mismatch index in 2005 cross those 74 countries[7]. The main outcome of the figure is the significant het-

[6]In the picture, grey represent countries for which there was no data available in this year.

[7]See table 1.4 for the index for each of the 74 countries in 2005.

erogeneity across this sample of countries.

To explore and analyze in greater detail this heterogeneity Table 1.3 presents the index averages for 2005, and the breakdown by gender and by countries' income according to the World Bank[8]. The sample is divided between high income countries and non-high income countries[9], in order for both groups to have roughly the same number of countries.

[Table 1.3]

There is a significant difference between the average mismatch among female and male workers in the whole sample. The average mismatch among female workers is close to 36% higher than the skills mismatch observed for the male workforce. This can be attributed to some extent to gender gap issues in the labour market that have been well documented in the literature. In particular, occupational segregation tens to be observed among women in the labour market. According to ILO (2012), less than 20% of women were employed in industry, while almost half were employed in the sector services and slightly more than 33% were employed in agriculture. This level of segregation has strong implications in our index. Even though women's education distribution presents strong differences when compared to men, it does not go to the extent of this occupational segregation. It is therefore understandable that the values of the index for women is significantly higher than that observed for men across the sample.

[8]http://data.worldbank.org/about/country-classifications/country-and-lending-groups

[9]Includes Upper Middle Income, Lower Middle Income and Low Income countries.

The other columns present results that were less predictable however. Not only is overall average mismatch higher in high income countries, but also the gender gap is significantly wider in these countries. Given that skills mismatch and gender differences are usually though of as negative features of a country's labour market, one could expect them to be more severe in poorer countries. However, one must bear in mind the way our index is constructed. For instance, a very poor country with most of its workforce employed in the agricultural sector would have a very low value for its index if most of its unemployed population was illiterate. Of course for such a country, low mismatch would by no means be a sign of the country's development.

To investigate the validity of this argument, the cross sectional correlation between the mismatch index and GDP per capita (1990 prices, PPP) for 2005, for 67 of the 74 countries (all for which GDP data was easily available) was computed. The correlation was very close to zero, underlining the message that this skills mismatch index should not be interpreted as an indicator of a country's development, but should rather be seen as a descriptive and analytical measure of country's labour market skills mismatch that should be used as a compliment to other tools dedicated to the study of labour market frictions.

1.3.2 Skill mismatch over time: 2000-2008

This section explores the time dimension of the sample. The analysis is focused in the 36 countries for which data is available for every year between 2000 and 2008[10].

Figure 1.2 plots the average index for the sample between 2000 and 2008, as well as the respective gender breakdown:

[Figure 1.2]

The level of skills mismatch across these 36 countries progressively decreased since 2000, with very similar trends for both men and women. There was a slight inversion of this trend around 2007 that may be related to the financial crisis of 2007. However, given the short time span of our dataset, it is impossible to make sure that this is actually the case (even though longer series for the US and UK studied later in the chapter do suggest an increase of mismatch around this period in both countries, both according to the authors and to this index).

Figure 1.3 breaks down this subsample between high income countries (25) and the rest of the subsample (11).

[Figure 1.3]

[10]Unfortunately, data after 2008 is not available for most countries, which makes any analysis regarding the effect of the recent financial crisis on mismatch unfeasible at this stage.

The differences between the two groups of countries are quite striking. While high income countries show a slow, steady decline in mismatch along this period (dropping around 5% during the period), the evolution of mismatch in the 11 non-high income countries in the sample is quite less steady. The index drops quite fast from 2000 until to 2004 (around 14%), but then bounces back up 10% until 2008. The result is that in the end, albeit the erratic behaviour, the difference between the 2000 and the 2008 average for these countries is actually very close to what was observed in high income countries (around 5% in both cases).

[Figure 1.4]

Figure 1.4 breaks down skills mismatch both by gender and by countries' income level. The gender differences for high income countries are similar to those observed in Figure 1.2. The predominance of high-income countries on this subsample drives this similarity to a significant extent. The gender breakdown for non-high income countries however presents different patterns. What is observed is that the fast collapse of mismatch in 2004 and subsequent bounce in these countries was driven solely by the male population (which predominates in most of these countries' workforces) whereas the skills mismatch for the female population shows a behaviour that is much more in line with what is observed in high income countries.

The main message that emanates from this section of the analysis is that mismatch has shown a slow, steady decline between 2000 and 2008, with differences both across genders and between countries of different income

levels.

1.3.3 Skills mismatch and investment in education

The importance that mismatch can have for policy making decisions was already mentioned earlier in this chapter. Given the strong relationship between skills and qualifications, many policy decisions that address countries' mismatch issues are directly related to the education system. Making policy conclusions based on the levels of skills mismatch identified through this index however should be made with caution.

The definition of mismatch associated with this index gives the same weight to an excess of supply of highly educated workers and shortage of it (the same being valid for the other two types of qualifications considered). Therefore it can be hard and unclear to make policy related conclusions based on this index: the index can indeed indicate the existence of a mismatch problem in the labour market, but will not give a clear picture on the nature of the problem (i.e, whether labour supply for one sector is not enough of excessive, or to which sector it pertains, and so on).

Still, it can be expected that higher levels of investment in education lead to lower levels of mismatch, since investment in education, when done properly, should aim at adjusting labour supply to what the labour market's needs in terms of workers' classification/skills, and not at just blatantly increase the average education level in hopes that this can by itself raise the job qualification profiles, or productivity.

To take a look at this issue, this section compiles yearly data on overall investment in education (as a percentage of GDP) for 45 countries in the

sample, for the period between 2000 and 2004. Table 3 presents the cross sectional correlation between these countries' index values for 2005, and each of these years' investment in education.

[Table 1.2]

Independently of the lag used to compute this correlation, there is a strong negative correlation between our index and the levels of investment in education. Baring in mind that by construction, a higher value for the index means a higher degree of mismatch in the economy, the main message of this table is that, on average, countries with higher levels of investment in education have lower degrees of skills mismatch in the labour market.

Given that we use in total 45 countries in this calculations, and the sample of countries for which there is available data on education investment varies from year to year, one could worry about composition issues while comparing each of the year's correlation. Although there were only 17 countries in the sample for which there is data for every year from 2000 to 2004, the correlations based on this reduced sample were also calculated to test the robustness of these findings. The results were in line with what is presented in Table 1.2, with the correlation varying between -0.4 and -0.6 . This means that, at best, if there are sample composition issues, accounting for them will lead to a stronger relationship between countries' investment in education and the level of skills mismatch in their labour markets, further strengthening the conclusions above.

The results suggest that higher levels of investment in education can

indeed reduce the level of skills mismatch in the labour market. Making casual conclusions based on a cross section correlation should be taken with a grain of salt, but these results can be indicative that higher investment in education are at least associated with a better match between labour supply's and labour demand's skill level. Moreover, to the extent that the literature finds evidence of a relationship of this nature between skills mismatch and education, the results of this section will further confirm the ability of this index to capture the mismatch in the economy in an accurate way.

1.3.4 Sectoral contribution to skills mismatch

This section looks at the contribution of each of three sectors considered in the index to the overall mismatch index. Table 1.3 presents the decomposition, in 2005, for the 74 countries available, as well as the average for high income and non-high income countries.

[Table 1.3]

When the whole sample is considered, each sector seems to have a rather proportional contribution to mismatch. The picture changes slightly however when we split the sample between high income and non-high income countries. The only contribution that seems rather constant regardless of the sample breakdown is that of the secondary sector, which always accounts for slightly more than a third of the overall mismatch. The other two sectors contributions are significantly different when the sample is plit. In non-high income countries, the biggest share of mismatch comes for the primary sector, with the tertiary sector playing a less significant role, with the opposite happening in high income countries.

Although high income countries seem to have higher mismatch levels in the tertiary sector, one cannot say whether this comes from excess supply of qualified workers or a shortage of it. Further analysis would be needed, and probably an alternative measure of mismatch should be considered in order to address this. Nonetheless, it is clear that while high income countries should focus their analysis mostly on the high end of the skills spectrum of their workforce, other countries should pay closer attention to their situation

in the other end, i.e on the part of the workforce with a lower skill/education level.

Even if a deeper analysis into each sector's contribution would require a more detailed measure of mismatch by sector, or a more detailed decomposition of each sector, it seems clear that again, as it has been shown earlier in the paper, there are indeed significant differences between high income and non-high income countries in terms of the nature of their labour market frictions.

1.3.5 The index and the literature: a comparative analysis

The index constructed in this chapter can be distant from more elaborate or micro founded approaches to measure or estimate skills mismatch in the labour market under some perspectives. Still, we are convinced that to the best of our knowledge no other index with greater degree of complexity or detail is easily applied to such a large and diverse sample of countries. Despite some potential limitations, this index does manage to capture the overall skills mismatch of an economy in a straightforward, competent way In order to support the claim about the index's accuracy, this section compares the index's behaviour with what other authors have found using alternative methodologies.

The comparison focuses on two particular works in the literature that apply much complex methods to estimate skills mismatch. We compare the

index results for the USA with the work of Sahin et al (2012) [11]. In the United Kingdom's case, the comparison is made with the results from Patterson et al(2013).

On these two papers, the authors, based on a theoretical model, "measure mismatch by comparing the observed allocation of unemployment and vacancies across sectors to the optimal allocation chosen by a planner who can freely move labour across sectors." Although a full description of this methodology will not be presented here, it is important to stress how different the approach from these papers is from this chapter's. First, these papers have a theoretical model as a background to the way labour demand is measure on their approach (through job vacancies).

Another important difference between these papers' approach and this chapter's is the data frequency. To make the results of this chapter as comparable as possible with those of these two papers, this section uses higher frequency data for the two countries in question. Monthly data for employment by sector and overall unemployment by education level in the US was collected from the Bureau of Labour Statistics. Quarterly data for the same period and same variables in the UK was collected from the Eurostat Statistics.

Figure 1.5 presents the index behavior between 2006 and 2009 in the United Kingdom, roughly the same period considered by the authors in Paterson et al. (2013).

[Figure 1.5]

[11] http://www.nber.org/papers/w18265.pdf

What Patterson et al (2013) find in their calculations of occupation mismatch in the UK is a small decrease between 2007 and 2008. This is followed by significant increase from 2008 to 2009, and subsequent decline that is only slightly inverted in 2011. Looking at figure 1.4, it is clear that there is a strong parallelism with the behavior just described. According to the index, there is a drop from 2006 to 2007, a subsequent strong one year long increase, and subsequent drop that is only reverted in the end of the period. The precise timing of these events is not exactly the same in the two cases, but this slight lag does not cloud the conclusion that the index does succeed to a remarkable extent to mimic the results from these authors, using a much simpler technique.

In order to understand whether this can be a coincidence, or this is case in other countries too, figure 1.6 presents the behavior of the index in the US. The dashed line presents the index measured at a monthly frequency, whilst the solid line represents 12 months moving average used to smooth the index's variation over time, and facilitate its comparison with the results from the paper mentioned below.

[Figure 1.6]

There are also similarities in the US case, according to figure 1.6. Our mismatch index is much more volatile, but looking at the smoothed tren, and comparing it with the figures presented by Sahin et al (2012) concerning occupational mismatch there are some significant co-movements. First, there is in both cases a small decrease in the beginning of the period. This is

followed by a significant growth that leaves mismatch at a higher level for 2 to three years which in both cases start to decline after 2010. Again, the index in this chapter is a lot more volatile that the results presented in the Sahin et al. Nonetheless, the general pattern is still strongly similar in the two cases.

It would be interesting to see longer series to understand whether this difference in timing is particular to these periods or if it is also observed in others. Unfortunately so far these are the only results supplied by the authors, so we cannot draw any further conclusions. Still we think that this index is significantly similar to their measure of mismatch when one takes into account the two approaches are different in so many levels.

Concluding, this section's exercise, albeit limited in certain aspects such as time span or the number of countries it is applied to, does highlights some of the strengths of the index presented in this chapter. The index is able to mimic in a general way the evolution of skills mismatch found in papers with a very different and much more complex methodological approach to mismatch measuring/estimation. This suggests that even if the index lacks the depth or complexity present in other alternative ways to measure skills mismatch, it still delivers to capture the overall skill mismatch in the economy quite well.

1.4 Conclusions

This chapter proposes a approach to measure skills mismatch in the labour market. The methodology adopted, through a creation of a new index, allows for the level of skills mismatch in the labour market to be calculated for a large, heterogeneous number of countries. At the same time, the index is also able to mimic some of the findings in the literature.

The results show an overall decline of mismatch between 2000 and 2008, with differences in patters when the sample is broken down by gender and countries with different income levels.

Mismatch is found to be higher on the primary sector on non-high income countries, while the tertiary sector concentrates most of the skills mismatch in high income countries. Mismatch is negatively correlation with investment in education, throughout the countries in the sample with available data. On the other hand, the cross section correlation between skills mismatch and GDP per capita does not seem to be significant within our sample.

The comparison of the index with other results in the literature suggests that the index, albeit being simplistic to some degree, is able to capture the general behaviour of skills mismatch in the labour market while being easily applicable to a very large number of countries in a relatively consistent and comparable way.

This chapter's contribution should be seen not as a conclusion, but as a stepping stone for future research aimed at studying the issue of skills mismatch in the labour market. The index's ability to reproduce to a significant extent the results of other analyses which make use of far more elaborated and data demanding techniques, combined with the fact that it is easily ap-

plicable to a vast number of countries opens the path for future research to extend its geographical scope beyond the world of developed countries, that is to this day the subject of most of the research in economics. That is in essence what this chapter's main message is: it is possible to extend labour market analysis to a wide range of countries without necessarily reducing the quality of the methods implemented.

This chapter offers an important contribution to the literature, by introducing a fairly new way to measure skills mismatch in labour markets, applicable to a vast number of countries like no other we are aware of, that future research can build upon in order to strengthen our understanding of cross country differences in skills mismatch, mismatch behaviour over time or the impact that different policies can have on that very same skills mismatch level.

Figures and Tables

Table 1.1: Summary statistics - 2005

Gender	Full Sample	Number of countries	High Income Countries	Number of Countries	Non High-Income Countries	Number of Countries
Total	0.25	74	0.27	36	0.24	37
Female	0.32	74	0.35	36	0.30	37
Male	0.24	74	0.24	36	0.24	37

Table 1.2: Sectors contribution to skills mismatch

Countries	Primary Sector	Secondary Sector	Tertiary Sector	Number of countries
All countries	32%	35%	32%	74
Non-High Income Countries	38%	37%	25%	37
High income countries	28%	34%	38%	36

Table 1.3: Sector classification

Sector (ISIC, Rev.4 1990)	Classification
A - Agriculture, hunting and forestry	Primary
B - Fishing	Primary
C - Mining and quarrying	Primary
D - Manufacturing	Primary
E - Electricity, gas and water supply	Secondary
F - Construction	Primary
G - Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	Secondary
H - Hotels and restaurants	Secondary
I - Transport, storage and communications	Secondary
J - Financial intermediation	Tertiary
K - Real estate, renting and business activities	Secondary
L - Public administration and defence; compulsory social security	Tertiary
M - Education	Tertiary
N - Health and social work	Tertiary
O - Other community, social and personal services activities	Secondary
P - Private households with employed persons	Secondary
Q - Extra-territorial organizations and bodies	Tertiary
X - Not classifiable by economic activity	-

Table 1.4: Skills mismatch in 2005

Country	Index	Income Classification	Country	Index	Income Classification
Argentina	0.17	UMI	Kyrgyzstan	0.46	LI
Australia	0.28	HI	Latvia	0.30	UMI
Austria	0.31	HI	Lithuania	0.38	UMI
Azerbaijan	0.57	UMI	Luxembourg	0.41	HI
Bahamas	0.40	HI	Madagascar	0.18	LI
Bangladesh	0.09	LI	Malaysia	0.30	UMI
Belgium	0.26	HI	Malta	0.53	HI
Belize	0.40	LMI	Mauritius	0.18	UMI
Brazil	0.23	UMI	Mexico	0.17	UMI
Bulgaria	0.18	UMI	Mongolia	0.19	LMI
Canada	0.08	HI	Montenegro	0.31	UMI
Colombia	0.26	UMI	Morocco	0.09	LMI
Costa Rica	0.31	UMI	Netherlands	0.29	HI
Croatia	0.41	HI	New Zealand	0.10	HI
Cyprus	0.05	HI	Nicaragua	0.11	LMI
Czech Republic	0.42	HI	Norway	0.28	HI
Denmark	0.17	HI	Panama	0.07	UMI
Dominican Republic	0.08	UMI	Peru	0.20	UMI
Ecuador	0.03	UMI	Philippines	0.35	LMI
Estonia	0.34	HI	Poland	0.48	HI
Ethiopia	0.04	LI	Portugal	0.32	HI
Finland	0.23	HI	Romania	0.47	UMI
France	0.23	HI	Russia	0.22	UMI
Georgia	0.57	LMI	Slovakia	0.39	HI
Germany	0.27	HI	Slovenia	0.42	HI
Greece	0.13	HI	South Africa	0.24	UMI
Hungary	0.30	HI	Spain	0.20	HI
India	0.46	LMI	Sweden	0.30	HI
Indonesia	0.07	LMI	Switzerland	0.21	HI
Iran	0.11	UMI	Taiwan, China	0.42	N/a
Ireland	0.16	HI	Thailand	0.19	UMI
Israel	0.19	HI	Turkey	0.05	UMI
Italy	0.22	HI	Ukraine	0.33	LMI
Japan	0.37	HI	UAE	0.02	HI
Kazakhstan	0.14	UMI	United Kingdom	0.28	HI
Korea, Republic of	0.26	HI	United States	0.03	HI
Kuwait	0.23	HI	Uruguay	0.29	UMI

Figure 1.1: Skills mismatch across the world in 2005

Figure 2.3: Average Benefits

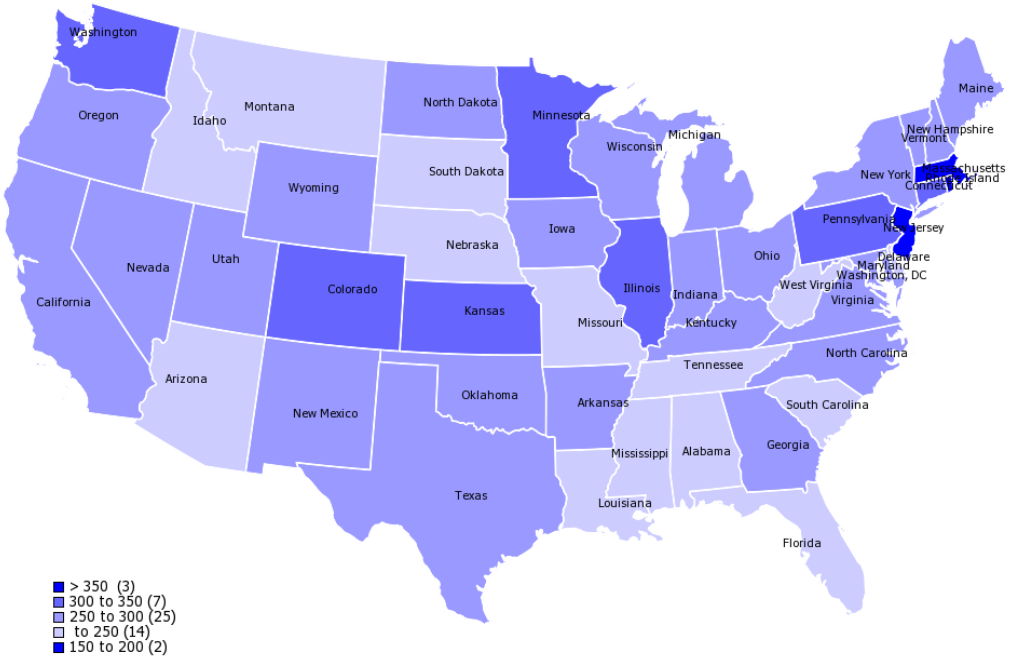


Figure 2.4: Minimum and Average Benefits

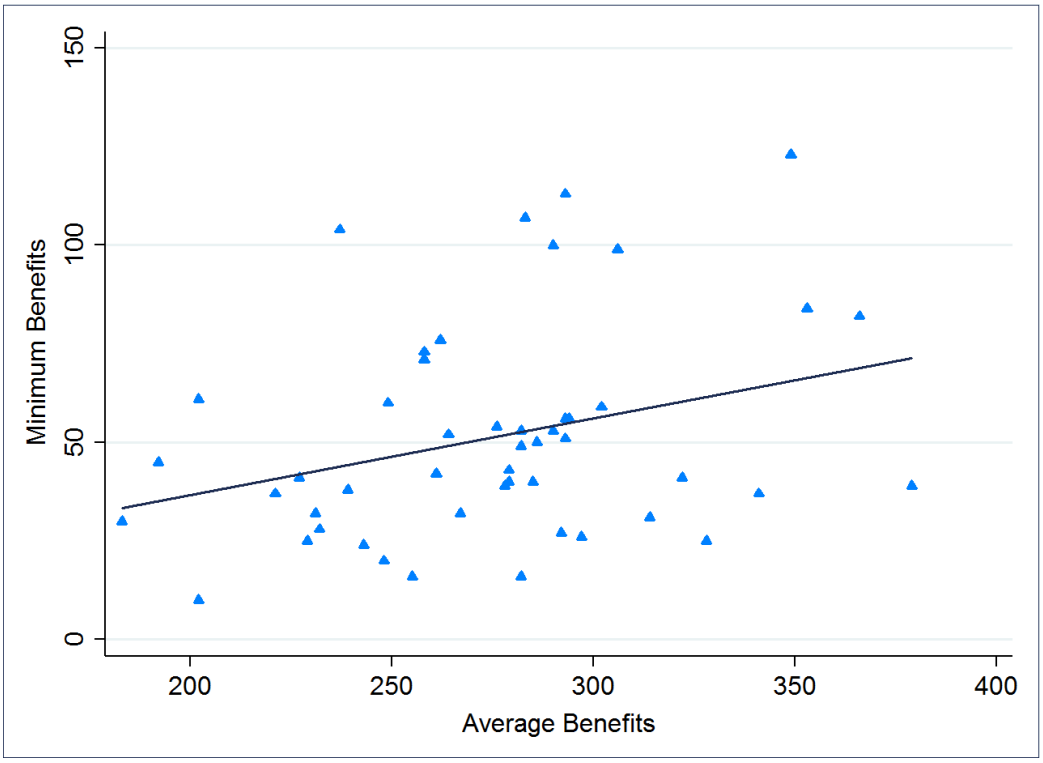
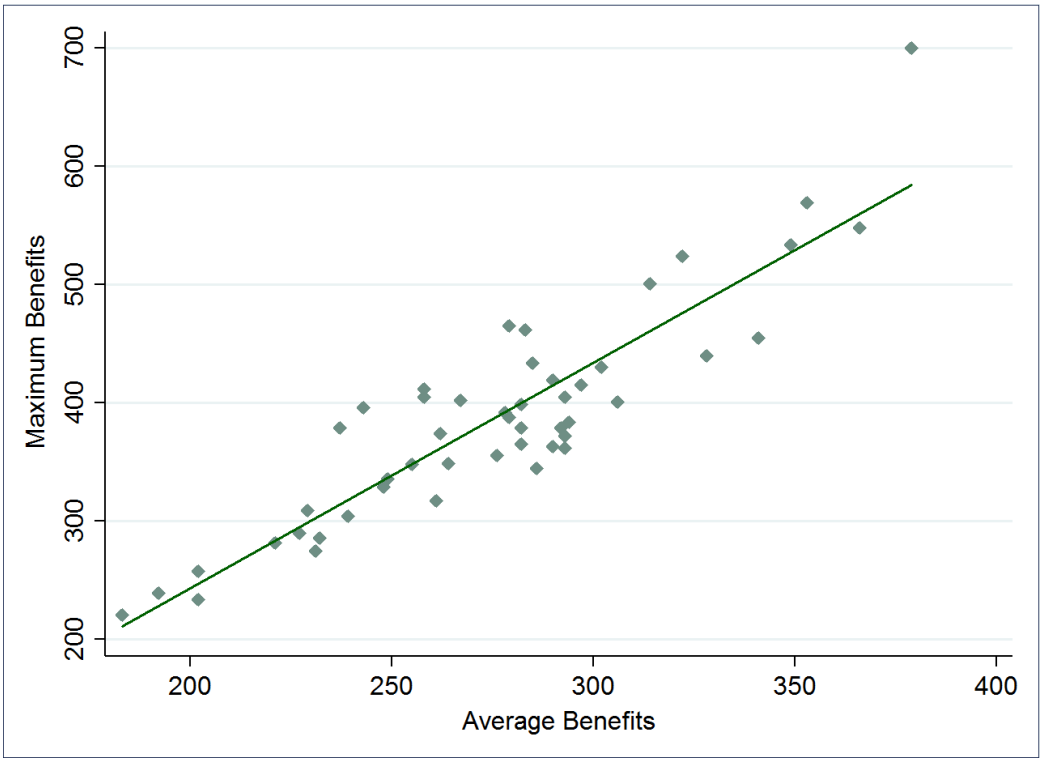


Figure 2.5: Maximum and Average Benefits



Chapter 3

Does facilitating dismissals lead to lower unemployment? Not in recessions

"Muscles aching to work,
minds aching to create - this is man."

The Grapes of Wrath, John Steinbeck

3.1 Introduction

The debate about employment security and legal restrictions on the dismissal of workers has been part of both political and economic landscape ever since employment protection legislation first was implemented. Regulation aimed at guaranteeing employment security is important as, by limiting employers' ability to dismiss workers, it guarantees a degree of parity and fairness within employment relationships.

This type of regulation can also have other positive effects in the economy, for instance by helping to smooth employment levels along the business cycle. However, these legal constraints to firms' labour demand adjustments can also have less desirable consequences in the labour market. Excessive employment protection legislation can slow down often necessary labour demand adjustments, which lead to a less efficient allocation of resources. This effect is pointed by many authors as one of the reasons behind being behind the sluggish employment growth observed in Europe in the 1970s and 1980s - a phenomena referred to in the literature as eurosclerosis. This conclusions were supported by the example of the USA, a country with much faster employment growth at the time where restrictions on dismissals were much looser than in most European countries.

The literature on the impact of labour market institutions on labour market outcomes is vast, and spans many different areas. The diversity of approaches both empirical and theoretical that followed the seminal study from Lazear (1990) is well document by works such as Addison and Teixeira (2003) or Baker et al (2003). Both works point to results almost as varied as the number of different approaches taken to study this relationship. This lack

of consensus is one of the reasons that the number of works dedicated to this topic grew even faster in recent years. A more recent review of the empirical literature by Per Skedinger (2011) associates higher employment protection legislation with lower turnover and job reallocation levels, but fails to find a consistent link between stricter EPL and higher unemployment levels.

This paper stands out from the literature in several respects, being more unique in some than in others. One, it focus on a single facet of EPL – dismissal rules – instead of taking the more widely used approach in the literature of looking at labour market institutions as a whole. Second, it departs from the strand of literature that looks at unemployment as it main variable to measure the impact of such institutions. This chapter uses unemployment inflow and outflow rates to supply a more detailed understanding of how institutions – and in this particular case dismissal costs – affect employment dynamics. And thirdly, it makes use of a new source of policy data: the ILO policy inventory. This type of database, developed by the ILO in recent years, document policies in a wide range of topics, and is as valuable as it is underused in the literature so far. This type of data source allows for the identification of the timing of policy changes on every domain, hence being particularly suited for the analysis of the impact of policies in labour market outcomes. It departs from other measures of change in labour market institutions which concentrate on coding labour market institutions, and then proceed to identify as policies or reforms the variations on the value of that coding. The approach of this chapter focuses on the policies themselves, which increases the variability of the policy variables used when compared to other measures such as the OECD EPL indices, and abstains from making

any judgments on the weight of each policy change.

Regardless of these differences, there are several empirical studies that, to one extent or another, relate closely to this chapter. For instance Kahn (2007) uses EU household panel data to study the period between 1996 and 2011 in nine countries, finding short-term negative effects on employment of policies that reduce employment protection [1].

Heyes & Lewis (2015) is also an important related publication as it documents the dedication of policy makers to weaken employment protection observed across the EU after the crisis, which is the starting point of this chapter . Other works such as Feldmann (2009) find employment protection to be associated with higher unemployment, but the country sample used differs to a great extent to the scope of this paper.

Avdagic (2015) uses an alternative data source to show that government's efforts to deregulate EPL in Central and Eastern Europe have failed to reduce unemployment, even on young people – a group that is found in the literature more likely to be affected by such policies. These results are in line with those of Noelke (2011).

A paper that relates closely to this chapter's approach on how to measure policies is that of Turrini et al (2014) which uses the LABREF database used

[1] A series of papers that include Bernal-Verdugo et al (2012) or Crivelli et al (2012) studied large panels of countries and find evidence that more flexible labour markets were better equipped to recover from the effects of the financial crisis. This evidence was severely and convincingly contested on methodological grounds by Aleksynska (2014), and hence their results are not discussed, even though their scope is close to that of this analysis, and these are some of the more relevant or at least widespread read works on the role that employment protection legislation played on countries' recovery from the crisis.

also in this chapter. However, the paper focus on different type of policy instruments, namely tax and benefit reforms.

In the end, it is important to acknowledge that the study of the impact of policy reforms in Europe after the crisis is still ongoing, and it is to contribute to that stream of work that this chapter is written.

This chapter investigates whether policies changing dismissal rules and costs implemented by European Union (EU) member states between 2000 and 2013 had a significant impact in unemployment flow rates. To accomplish its goal this chapter makes use of two policy databases: the ILO Inventory of Labour Market Policy Measures (KILM) in the EU 2008-13 and the LABREF database from the European commission. Additionally, unemployment inflow and outflow rates from the ILO Key Indicators of the Labour Market are used to proxy for job destruction and job creation, respectively. The chapter's goal is to strengthen our understanding of how labour market policies interact influence unemployment flows, particularly during recessions.

The discussion about the benefits and costs of employment protection legislation was brought again to the spotlight in the wake of the financial crisis, with many blaming costly and slow dismissal procedures for the high unemployment levels recorded in countries like Greece, Portugal or Spain. Following this idea, several countries were pressured to implement policies that facilitated dismissal procedures or decreased their costs. In some countries' cases - such as Greece and Portugal - such measures were imposed within the framework of the bailout packages agreed with the troika(composed by the European Commission, the European Central Bank and the International Monetary Fund).

The main argument supporting this type of policy measure is that by making the dismissal of workers easier to some extent, employers will be less reluctant to hire new workers, as they know they will be able to fire them more easily or less costly in the future in case of necessity. But as the cost and/or complications of firing workers are decreased, firms can also start to fire more workers. That means that this type of policy measure can have two contradictory effects in (un)employment levels. And hence, the question arises: Which of these two effects dominate the other? Knowing the answer to this question is vital to understand the net impact of this type measures in labour market outcomes. It is that question that this chapter aims to answer.

The rest of this chapter is structured as follows: section 3.2 presents and describes the data used; the methodology is presented and discussed in section 3.3; section 3.4 is dedicated to the presentation, interpretation and discussion of the results; and section 3.5 concludes

3.2 The Data

This chapter makes use of data from three different sources. Data for policies was retrieved from the forthcoming "Inventory of labour market policy measures in the EU 2008-2013", from the ILO, and the LABREF database from the European Commission[2]. Inflow rates into unemployment and outflow rates of unemployemt where retrieved from the ILO's Key Indicators of Labour Market (KILM) database [3]. This section is divided into two parts. In the first, the data regarding policies is presented and discussed. The second is dedicated to describe the unemployment flow rates used during the chapter to proxy for job creation and job destruction.

3.2.1 Policy data

The ILO's Inventory of Labour Market Policy Measures and the LABREF database were both created with the goal of listing and classifying policies implemented in EU member states across several topics and dimensions. This chapter uses both of them as compliments. This complementarity comes from the fact that the ILO Inventory addresses a shorter period, but has information on the quarter/month in which policies are implemented. Hence the ILO data is used to study the question in hands using higher frequency data, whereas the LABREF database is used to enable the analysis to go beyond the post crisis period, albeit using only annual data.

Both the ILO inventory and the LABREF databases have remarkably similar shares of policies aimed at changing dismissals procedures: 6% and

[2] $https://webgate.ec.europa.eu/labref/public/$

[3] $http://www.ilo.org/empelm/what/WCMS_114240/lang--en/index.htm$

5% of the overall number of policies, respectively. The ILO inventory includes all policies regarding dismissals in a single category. The LABREF database however has policies concerning dismissal divided in three separate policy fields: "Collective dismissals", "Definition of fair dismissals" and "Notice and severance payments". For the rest of this chapter, policies in all three policy fields will be included under the same"dismissal" label for simplification.

Figure 3.1 presents the distribution of policy measures across member states in the two databases, for the period between 2008 and 2013 when both datasets overlap.

[Figure 3.1]

Differences in the number of policies was expectable as the LABREF database is much more extensive than the ILO's. Nonetheless, with some exceptions, both databases identify very similar trends. In both databases South European countries are amongst those with more policies in the area, and on most countries with less policies implemented are also common in the two cases.

To further illustrate those differences and similarities, figure 3.2 presents the distribution of the total number of policies in this area over time.

[Figure 3.2]

During the period in which the two data sets overlap, there is a very sim-

ilar pattern in the evolution of the number of policies implemented targeting dismissal procedures. The only significant differenc is the fact that between 2010 and 2011 the LABREF identifies a constant number of policies, whereas the ILO inventory shows a decrease in that number. Nonetheless , the behavior of both series over the rest of the period remains however remarkably similar.

The number of policies in the area increased remarkably in the aftermath of the financial crisis, if one focus its attention on the LABREF series. This underlines that not only this became a hot topic of debate amongst economists and politicians during the period, but it also made its way to policy makers decisions at a remarkable pace: the number of average policies per year went from an average of less than 8 between 2000 and 2007 to almost 15 between 2008 and 2013 according to the LABREF database.

Although these databases are source of invaluable data, they also have some shortcomings that are important to acknowledge and discuss. The way policies are coded in both databases implies that every policy is weighted the same way, regardless of their magnitude. But no two policies are made the same, so this coding can be seen as an over simplification. However, weighting such policies goes beyond the scope of this chapter. Moreover, ILO (2005b) shows that the inventory's dismissal policies category captures to a great degree the changes in the OECD EPL index dedicated to dismissals, which weights changes in employment protection legislation concerning the dismissal of worker both at the individual and collective level. This is a sign that even without undertaking any weighting exercise, does a consistent job in identifying significant changes in the legislation framework of dismissal

procedures.

Finally, to allow for the coding of the policy variable described later in the chapter, there is a need for an indicator of the direction of the policy in question. In the case of the ILO inventory, the concept of the "Main Beneficiary" is used. The chapter codes as policies facilitating dismissals those that have employers as the main beneficiary, whist policies that benefit first and foremost workers are considered as increasing workers' protection against dismissal. In the case of the LABREF database, the concept of the direction of policies is used. According to the database's user guide, in the case of policies that concern job protection, coding the policies as "Increase" implies that the measures increase "protection against job dismissals", among other factors. So, what in the ILO inventory is defined as a policy that has the employer as main beneficiary, is classified in the LABREF database as a policy "decreasing" protection. Conversely, if a policy has workers as the main beneficiary, it increases protection.

In order to gauge how much the two databases diverge on this respect, figures 3.3 to 3.5 present the breakdown of policy measures in each database according to their direction/beneficiary[4].

[Figure 3.3]

[Figure 3.4]

[4]For simplification purposes, measures that had no clear direction were omitted in both graphs, as they concern a negligible share of the total policies in both cases.

[Figure 3.5]

The two datasets identify a strong emphasis on policies aiming at making dismissal procedures easier or less costly on the post financial crisis period. Before the crisis, there was a greater share of policies concerning dismissals aimed at increasing workers protection in that area. These results point to a change in the dominant direction of dismissal policies in the aftermath of the financial crisis to the benefit of firms/employers.

3.2.2 Unemployment flows

The goal of this chapter requires not only data on policies that change dismissal procedures and/or costs but also variables that can translate their impact in the labour market. Given the arguments for and against the facilitation of dismissal procedures, the most significant impact should be felt in job creation and job destruction levels. In this chapter, they are proxied for with data for unemployment's outflow and inflow rates, respectively.

Unemployment inflow and outflow rates are flow measures that describe the dynamics in the labour market. The outflow rate measures how quickly an unemployed person finds a job, whilst the inflow rate measures the rate at which an employed person enters the unemployment pool. These rates are directly related to the probabilities that an employed person becomes unemployed and an unemployed person becomes employed. While probabilities denote the likelihood of transition occurring within a discrete time period, inflow and outflow rates correspond to instantaneous rates of transition on a

monthly basis. These rates are calculated on the basis of data on the labour force, the unemployment rate and unemployment by duration. Various durations are used to calculate flow rates, relying on the methodologies developed by Shimer (2012) and Elsby et al. (2013)[5].

To gain a broad picture of the cross country differences in these variables within the sample, figure 3.6 presents the distribution across states of both rates' average between 2008 and 2013.

[Figure 3.6]

There is significant variation across member states in term of their flow rates. There is also some evidence that the two flows are positively correlated to some extent. This could be the result of the two effects mentioned earlier: more flexible labour market legislation can lead to more hirings as well as more firings, leading to the two rates to co-move to some extent. To further investigate the differences and similarities between the two variables, figure 3.7 plots the unweighted EU-27 average of each variable between 2000 and 2010.

[Figure 3.7]

The figure shows a significant increase in outflow rates from unemployment after 2004. When the financial crisis hit European economies in 2008,

[5]A more detailed description of the methods use to calculate the data used in this chapter can be consulted at http://kilm.ilo.org/2011/download/FlowsEN.pdf

the two rates go in opposite directions: inflow rates into unemployment spike, and outflow rates drop.

The drop in outflow rates was due to less jobs being available in the economy, but also to the increase in the pool of unemployed workers, which increases the competition for each open vacancy, lowering the probability each unemployed worker will find a job.

The increase in inflow rates was also clearly associated with the lower number of jobs across European labour markets, leading to large levels of job destruction.

It is in order to understand the extent to which dismissal policies influenced these changes in unemployment flows that the analysis of the next section is undertaken.

3.3 Methodology

In order to estimate the impact of the implementation of policies that change dismissal procedures, the following empirical model is used:

$$UFR_{i,t} = \alpha + \beta D_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t} \tag{3.1}$$

where the subscript i indicates the country and t represents the period. $UFR_{i,t}$ represents the unemployment flow rate (outflow or inflow), as calculated by the ILO, and $X_{i,t}$ is a vector of control variables. $\varepsilon_{i,t}$ represents the error term.

Variable $D_{i,t}$ represents the policy variable. In all its variations, a higher value of the variable indicates a higher number of policies implemented that facilitated dismissal procedures for employers. The variable was coded in three alternative ways, to ensure the robustness of the results was not dependent to the way policies are (not) weighted in both databases.

In the first variation, the variable is coded as a dummy variable. For each country, $D_{i,t}$ assumes the value of 0 from the beginning of the sample until the period in which a policy that facilitates dismissals is implemented. The variable value switches to one in the period when the first policy is implemented and remains with that value until the end of the sample[6].

The second variation of variable is cumulative, in the sense that the variable assumes value 1 when the first policy is implemented, 2 after a second measure is implemented, and so on.

[6]Unless the policy is temporary, in which case the dummy reverts to 0 when the policy is terminated .

In the third alternative the cumulative D variable was further enhanced by including dismissal policy measures that increased workers' protection and assigning a negative (–1) weight to them[7].

The empirical framework described above can, given the structure of the data set, create econometric problems that need to be taken into account when deciding the type of estimation method to implement, in order to ensure that the estimations lead to efficient, unbiased results.

The first issue has to do with reverse causality. It is plausible to hypothesize that not only can policies lead to changes in unemployment flows, but that also policy makers might react to unemployment flows. This chapter assumes that in the case of inflow rates into unemployment, if there is such a reverse effect, it is negative: when there are larger inflows of workers into unemployment, policy makers are less likely to implement policies that can increase those rates even further. More simply, it is assumed that governments are less likely to implement policies that make dismissals easier when firms are firing workers at a faster pace. Under this assumption, if there is a reverse causality problem in this context, it will imply that the coefficient of the policy measure variable is actually underestimated, and the results can thus be interpreted in the limit as a lower bound for the actual impact of policies facilitating dismissal in inflow rates into unemployment. The same assumption is made regarding outflow rates from unemployment: the faster

[7]The results in most cases are not significantly changed by using this alternative, particular in the section using ILO/quarterly data, as most policies in the ILO inventory benefit employers. Hence, results using this third specification are omitted from the tables in the main text of the chapter. Appendix A presents the results of some of the regressions applying this definition of the D variable.

workers are exiting unemployment, the less likely governments are of implementing policies that have as main benefit increasing those very same rates.

In the context of this database, there are also issues that can rise if the variables in the model are not stationary. The null hypothesis that the unemployment flow rates have a unit root was rejected after applying a Fisher test using an augmented Dickey-Fuller[8].

An issue that can arise from applying a standard ordinary least square (OLS) to panel data is that the estimations will be biased if unobserved individual effects are statistically significant. Given the heterogeneity of the labour markets of the countries across the sample - evidenced for instance in figure 3.6 - this issue is likely to be present in the context of this analysis.

One possible alternative method that overcomes the shortcomings of OLS in this context is to use a fixed-effects model. Fixed effects methods assume a correlation between the error term and the regressor. This is an intuitively compelling option in this analysis, since each country has its own historical., social, economical and institutional background, which are likely to have permanent and significant influence on its policy making decisions and its labour market performance.

The problem of unobserved heterogeneity could also be overcome by using a random effects model. In that case, the model assumes the existence of a country specific effect that is not correlated with the regressores or the error term.

[8]The advantage of this test, when compared with alternative unit root tests for panel data frameworks, is that it can be performed in an unbalanced panel, whereas most of the others cannot (Maddala and Wu, 1999)

To assess which method is more adequate to this chapter's analysis, an Hausman specification test was performed in order to test the validity of the additional orthogonality conditions imposed by the random effects model. If they were valid, it means that the regressors are uncorrelated with the error term, and therefore the fixed effects model is consistent but inefficient. In that case, the random effects model should the preferred approach as it would be both consistent and efficient. However, if the test shows a correlation between the error term and the regressor, the random effects estimator would not be consistent, whereas the fixed-effects would be both consistent and efficient. The test performed rejected the null hypothesis that the error term is not correlated with the error term, and hence the fixed-effects is used as the preferred/benchmark approach throughout the rest of this chapter's analysis.

To ensure the results from the Hausman test were robust, the Breusch and Pagan Lagrangian multiplier test was applied. The null hypothesis in this particular test is that the variance across countries is zero. Again the results support the use of the fixed effects model in detriment of the random effects model.

Another way to overcome unobserved heterogeneity in the sample would be to use a first-differences approach. In the context of this database the use a first-difference method would lead to significant problems due to the low variability of the dismissal policy variable, particularly when it is coded as a dummy variable.

One could try to use a e general method of moments (GMM) to overcome problems that methods such as the fixed-effects or the first-differences model might present. However, the system GMM model is better suited to data

sets with a large number of individuals and a small number of periods, which is not the case of this sample. In this case, using a GMM approach would have led to a significant loss of degrees of freedom, given the size of the sample. Therefore the decision was made to keep the fixed-effect method as the benchmark estimation method.

Applying an instrumental approach could be yet another alternative to overcome unobserved heterogeneity issues in a panel data setting. Finding an appropriate instrument however is seldom easy or straightforward. In this case, the composition of the parliament could be seen as a potential instrument for the number of policy measures. The reasoning behind such instrument would be that, on average, parliaments with a greater share of "left wing" seats would be more reluctant to pass legislation that facilitates dismissal procedures. Hence, the coding of such instrument would associate the number of policies in this area with the number of seats in the parliament held by political parties on the right side of the political spectrum. Such an approach would imply the collection of data that goes beyond the scope of this chapter and will also be open to significant criticism, particularly when it comes to the categorization of parties using the left/right dichotomy.

Taking in to account the arguments above, this chapter opts to use a fixed-effects method to estimate the impact of dismissal related policies in unemployment flows. Even though that this method is not without shortcomings, they are considered to be smaller than those associated with other alternative estimation strategy. The negative bias of the fixed-effects model for instance is larger when there is a small number of periods and a large number of individuals in the sample. This implies that it would not be as se-

vere in these estimations as it would be in other data frameworks. Therefore, as long as the results supported it, the fixed- and random-effects estimation methods are used as the main econometric framework throughout the analysis.

3.4 Results

The section dedicated to the presentation and interpretation of the results in this chapter is composed of two parts.

The first uses data from the ILO inventory and quarterly unemployment flow rates to assess the impact of dismissal policies in the aftermath of the financial crisis.

The second part of the analysis uses policy data from the LABREF database and yearly flow rates between 2000 and 2013. This section has a twofold contribution: in one hand, it acts as a robustness check for the results of the first part of the section; and on the other hand allows to compare the pre and post crisis periods by breaking down the sample between two separate periods: 2000-07 and 2008-13.

All tables in the section include three columns. Column (A) includes the coefficients when the dismissal policy variable is coded as a dummy variable. Column (B) presents the results when the coding of the policy variable is cumulative. The third column (C) presents the results using a one lagged version of all independent variables to allow for the possibility of implementation lags regarding the policy variable, or for the feedback from these policies

to unemployment flows to take one period to take place.

All coefficients are estimated through a fixed-effects model.

3.4.1 Quarterly data: 2008-2013

By facilitating dismissal procedures and/or making them less costly, the policies included in the dataset can lead to higher inflows into unemployment, as employers' find it easier to terminate employment contracts. The table below presents the coefficients that estimate the impact of these policies on inflow rates into unemployment.

[Table 3.1]

The policy variable's coefficient is both positive and statistically significant in two of the three specifications presented[9]. This result suggests that policies that made the dismissal of employees easier or less costly lead to a statistically significant increase in inflow rates into unemployment.

In what concerns the control variables the coefficients are within what could be expected. Higher GDP growth leads to lower inflow rates into unemployment. The size of imports also seems to be connected to lower inflow rates. This can be a result of a greater share of the adjustment on labour demand after consumption/demand shocks hit the economy being made by foreign firms. Following this reasoning, higher (relative) import levels lead

[9]The third alternative of the policy variable also presented a positive a statistically significant coefficient under this specification.

to both lower inflow rates into unemployment but also lower outflow rates of unemployment. Table 3.2's results support this hypothesis. Both the share of exports and government consumption lead to higher inflow rates. On the export side, this can mean that the turbulence on the main trading partners lead to countries with more open economies to feel to a harsher degree the effects of the crisis, leading to higher job destruction. Government's consumption impact is not clear to explain. One possibility is that countries that had bigger public sectors - namely southern European countries - observed higher inflow rates into unemployment. In this case, this variable in particular would be capturing part of the country specific effect[10].

The results above suggest that the negative effects associated with policies concerning dismissals' legal framework were present to some extent during the period in these countries. The analysis now shifts its focus to the potential positive effects associated to these policies Table 3.2 presents the estimated coefficients for the impact of the policy variable on the outflow rates from unemployment.

[Table 3.2]

The results point to the absence of the positive effects associated with the policies under study. Moreover, whenever the relationship between policies that changed the legal framework of the dismissal of workers to the benefit of employers and outflow rates of unemployment was statistically significant, it was actually negative. Whereas the absence of the effect can be thought of as

[10]None of the results changes significantly if this variable is dropped from the analysis.

a lack of reaction from employers due to the negative economic context, and the skepticism of a recovery that has been tepid at best, an actual negative effect can be harder to understand. Perhaps it can be that observing a trend towards the reduction of dismissal costs and facilitating of the respective procedures, employers feel that these are not one shot policies, but part of a greater trend. In that case, they would be expect such costs to decrease further in the future, and then might keep the dismissal of workers to a near future where they feel they would be less costly. This is however just a tentative explanation for such result.

This section concludes that there is evidence that the negative effects associated with policies that facilitate dismissals were present in the aftermath of the crisis, across EU member states' labour markets, while the positive effects usually associated with this type of policies were absent.

3.4.2 Annual data: 2000 - 2013

This section makes use of the LABREF database to extend the analysis to a longer time series, from 2000 and 2013. The analysis works also as a robustness check for the previous section. The main drawback of using this database is that data regarding the date of policy implementation is available only on a yearly basis. Hence the analysis below focus on yearly flow rates out of and into unemployment.

The first part of the analysis focus on presenting and interpreting the results regarding the full sample, in a similar fashion to what is done in the previous section. In the second stage of the analysis, the sample is broken down into a pre and a post financial crisis period. This is done to study

whether the effects of dismissal policies changed to some extent after the financial crisis hit European labour markets.

Table 3.3 presents the estimations for the impact of labour market policies targeting dismissal procedures on yearly inflow rates into unemployment

[Table 3.3]

The results are very much aligned with the results of the previous section, with policies that facilitate dismissal procedures or lower dismissal costs leading to higher inflow rates into unemployment. All other coefficients have also the same sign as in the table 3.1, and they are again all statistically significant. Although not surprising, since a significant share of policies are common to both databases, the fact the results are robust to an extension of the period for additional eight years, and to the use of yearly flow rates underlines the robustness of the results of the previous section.

The next table focus on the impact of dismissal policies on outflow rates from unemployment for the same period as table 3.3.

[Table 3.4]

The results again fail to identify a clear positive effect from policies facilitating dismissals on job creation - only under one specification is this effect observed, whilst in the two others the inverse effect is observed. The results converge to those presented in table 3.2. The reason behind the absence of such effect can be that this is a channel that works mainly through the ex-

pectations of employers: expecting less costs in the eventuality of a need for the worker's dismissal, firms will be more likely (or less reluctant at least) to hire new employees. Give the unprecedented severity of the financial crisis repercussions in the labour market and the sluggish recovery observed in most countries, it is possible that employers' expectations were presenting in the aftermath of the crisis a higher degree of upward rigidity than normal.

To test the hypothesis discussed above, the next four tables are dedicated to breaking the sample in two periods: 2000-2007 and 2008-13. This exercise will try to shed some light on the validity of the hypothesis above that the absence of a positive effect from this policies can be specific to the post-crisis years. If it is valid, there will be observed a significant (positive) effect of these policies on outflow rates out of unemployment on the 2000-2007 period. Note however that the results below should be taken with an extra degree of caution, as the breaking down of the sample reduces the observations significantly when compared to all the analysis undertaken up to this point.

Tables 3.5 and 3.6 present the estimations for the pre and post crisis period when it comes to the outflow rates out of unemployment.

[Insert Table 3.5 here]

[Insert Table 3.6 here]

While the results for the post crisis case are inconclusive (as the coefficient has different signs depending on the specification of the policy variable), the coefficient of the policy variable in the pre-crisis period is always statistically

significant and positive. These results suggest that the hypothesis that the lack of a positive effect of these policies was specific to the most crisis period is indeed valid. This steams from the fact that this effect works mainly through employers expectations, which might be dominated by the gloomy economic prospects of the slow recovery registered in most countries in the sample.

Tables 3.7 and 3.8 present the estimations for the 2000-07 and 2008-13 period respectively, when it comes to inflow rates into unemployment.

[Table 3.7 here]

[Table 3.8 here]

There is no clear/statistically significant effect of dismissal policies on unemployment inflow rates in the two periods presented between the two tables. This can be due to the lack of observations in each case. In the limit, given the higher frequency of the data presented in the first part of this section, one should take those results into stronger considerations than these, as they are based on a significantly higher number of observations, while keeping the same methodology.

It is important to note that breaking down the sample in two is not the only way to compare pre and post crisis effects. An alternative method would be to create a "crisis dummy variable", and then create an interaction variable between this new dummy variable and the policy variable. The results with this alternative method did not depart significantly from the results presented

in this section: the interaction term shows an increase of the impact of the dismissal policy variable in unemployment inflow rates after the crisis, and a decrease of the impact of these policies on unemployment outflow rates after the crisis.

Overall, the results of this chapters suggest that the impact of policies that reduce workers' protection against dismissals changed significantly after the financial crisis. While before the crisis the positive effect of these policies on job creation was the only effect that was consistently statistically significant across different specifications, after the crisis the inverse is observed, with only the negative effect on job destruction being identified as being statistically significant.

The result that the positive effects of lowering EPL are only felt in good times mimics those of Bouis et al (2012) which finds that labour market reforms such as those affecting job protection or unemployment benefits have their positive effects felt quicker in good times than in recessions, involving in some cases short-term losses in severely depressed economies, which is clearly the case pointed by this chapter's results in the context of the EU labour markets after the crisis.

These results have important policy implications, as they suggest that dismissal related policies' impact in the labour market varies to an extent along the business cycle. Failing to take this into account can lead policy makers to implement policies that aim at improving labour market conditions but end up causing more harm than actually improving labour market dynamics. Future research should look at extending this analysis to other countries and periods, to improve our knowledge of whether these results are

consistent across any country/business cycle, or if they are specific to Europe and the economic scenario experienced before and after the 2007-08 financial crisis.

3.5 Conclusions

This chapter has been dedicated to the study of the impact of policies that change the legal framework of workers' dismissal procedures on unemployment flows.

By using data for European Union member states, at different periods and frequencies, the chapter shows that policies that made the dismissal of employees easier or less costly lead to a statistically significant increase in job destruction in the aftermath of the financial crisis. This result is robust to a variety of changes in the model's specification, from data source and frequency to the period of analysis or the approach taken to the coding of policy variables. On the other hand, the evidence from this chapter points to a non positive and/or significant impact of these policies on outflow rates form unemployment (i.e job creation) during that period.

When focusing on the pre-crisis period however, the evidence points to the fact that the positive effect associated with policies that facilitate dismissals were muted after the crisis, but were presented before it. This implies that the lack of a positive effect of these policies after 2008 is more likely a crisis specific feature, and whenever the economy and the labour market recover to their pre-crisis employment paths, such policies should have the desired positive effects once again.

This chapter improves our knowledge of the way policies that change dismissal rules interact with labour market flows during the business cycle. It provides evidence that reducing workers' protection against job dismissal has predominantly negative consequences during recessions, whilst the positive effects on job creation seem to dominate during booms.

To conclude, this chapter has deepened our knowledge of the way the legal framework that governs the procedures of the dismissal of workers can impact unemployment flows, when changed. By using one novel policy database, and an existing one, the chapter shows that policies that facilitated dismissal procedures have lead to an increase in job destruction in the years that followed the financial crisis. On the other hand, the positive effects in terms of hirings associated with such policies seemed to have been absent in the European Union countries during the same period .

These results stress the dangers of the reducing workers' rights and protection when labour markets are sluggish, and underline the necessity of a deeper knowledge of the way employment protection legislation changes interact with labour market flows, in order to enable policy makers to anticipate with greater precision the impacts of policies aimed at changing the legislative framework of employment relationships on employment and unemployment levels.

Appendix A: Sensitivity analysis

Given the number of results presented in the chapter, and the significant number of alternative specifications of all regressions ran to test the results robustness, present all the details on every single one of them was not feasible.[11]

To make the presentation of this sensitivity analysis clearer, the main robustness checks are summarized in table 3.9. The table indicates the sign and level of significance of the policy variable for every table, using each alternative specification. The benchmark results in the first two columns are retrieved from the first line of column B of tables 3.1 to 3.8.

[Table 3.9]

Specification (I) row presents the results of using the third alternative definition of the policy variable mentioned during the analysis. There are no significant departures from the main results, with the only times the coefficient change signs being in cases where they are not statistically significant.

The results of the benchmark analysis when controlling only for GDP growth are displayed in the columns concerning variation (II). Again the results are very much in line with those of the results section of the chapter.

Using Employment as an alternative measure of macro economic performance instead of GDP growth seems to reduce the overall level of significance of coefficients as it can be seen by the last two columns (III). However these

[11] Any particular set of results mentioned from this point onwards are available upon request.

results should be taken with caution because of the way the flow rates are calculated.

Finally, a set of other tests were performed on the quarterly data specification to additional test the robustness of the results. Adding labour force participation, the share of each sector in employment or unemployment growth as the macro variable substituting GDP growth all produce very similar results to the results presented throughout the chapter.

The results presented in table 3.9 underline the robustness of the results presented in chapter 3, increasing the confidence in its results, as they are robust to changes in the sets of control variables or on the codification of the policy variable, not to mention to the usage of different sources of policy data and data frequency, as it was already shown in the main body of the chapter.

Tables and Figures

Table 3.1: Policies' impact on unemployment inflow rates (2008-13 Quarterly data)

	Column A		Column B		Column C	
Policy Variable	0.00068	**	0.00026	*	0.00019	
	(0.00030)		(0.00016)		(0.00017)	
GDP Growth	-0.00021	***	-0.00020	***	-0.00029	***
	(0.00006)		(0.00006)		0.00006)	
Exports (% of GDP)	0.00015	***	0.00015	***	(0.00010	***
	(0.00003)		(0.00003)		(0.00003)	
Imports (% of GDP)	-0.00018	***	-0.00018	***	-0.00013	***
	(0.00003)		(0.00003)		(0.00003)	
Government Consumption (% of GDP)	0.00041	***	0.00043	***	0.00031	***
	(0.00009)		(0.00009)		(0.00010)	
Constant	0.00233		0.00187		0.00455	*
	(0.00253)		(0.00252)		(0.00262)	
Number of observations	455		455		455	
R-squared	0.09		0.09		0.07	

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.2: Dismissal policies' impact on unemployment outflow rates, 2008-13, quarterly data

	Column A	Column B	Column C
Policy Variable	-0.007	-0.008 **	-0.008 **
	(0.006)	(0.003)	(0.003)
GDP Growth	0.003 **	0.003 **	0.004 ***
	(0.001)	(0.001)	(0.001)
Exports (% of GDP)	-0.002 ***	-0.002 ***	-0.001 *
	(0.001)	(0.001)	(0.001)
Imports (% of GDP)	0.003 ***	0.002 ***	0.001 **
	(0.001)	(0.001)	(0.001)
Government Consumption (% of GDP)	-0.008 ***	-0.008 ***	-0.007 ***
	(0.002)	(0.002)	(0.002)
Constant	0.265 ***	0.263 ***	0.224 ***
	(0.049)	(0.048)	(0.053)
Number of observations	455	455	424
R-squared	0.21	0.2	0.2

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.3: Dismissal policies' impact on unemployment inflow rates, 2000-2013 annual data

	Column A		Column B		Column C	
Policy Variable	0.00108	***	0.00043	***	0.00060	***
	(0.00040)		(0.00011)		(0.00014)	
GDP Growth	-0.00013	***	-0.00013	***	-0.00002	
	(0.00004)		(0.00004)		(0.00004)	
Exports (% of GDP)	0.00013	***	0.00010	**	0.00001	
	(0.00004)		(0.00005)		(0.00005)	
Imports (% of GDP)	-0.00018	***	-0.00015	***	-0.00004	
	(0.00005)		(0.00005)		(0.00006)	
Government Consumption (% of GDP)	0.00042	***	0.00040	***	0.00039	***
	(0.00011)		(0.00011)		(0.00012)	
Constant	0.00129		0.00140		0.00081	
	(0.00260)		(0.00254)		(0.00280)	
Number of observations	271		271		260	
R-squared	0.03		0.05		0.06	

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.4: Dismissal policies' impact on unemployment outflow rates, 2000-2013 annual data

	Column A		Column B		Column C	
Policy Variable	0.0095	***	-0.0024	***	-0.0025	***
	(0.0027)		(0.0007)		(0.0009)	
GDP Growth	0.0005		0.0001		0.0008	***
	(0.0003)		(0.0003)		(0.0003)	
Exports (% of GDP)	-0.0023	***	-0.0016	***	-0.0004	
	(0.0003)		(0.0003)		(0.0003)	
Imports (% of GDP)	0.0026	***	0.0023	***	0.0006	
	(0.0003)		(0.0004)		(0.0004)	
Government Consumption (% of GDP)	-0.0041	***	-0.0037	***	-0.0029	***
	(0.0008)		(0.0008)		(0.0008)	
Constant	0.1359	***	0.1159	***	0.1217	***
	(0.0177)		(0.0176)		(0.0192)	
Number of observations	272		272		261	
R-squared	0.14		0.23		0.13	

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.5: Dismissal policies' impact on unemployment outflow rates, 2000-2007 annual data

	Column A		Column B		Column C	
Policy Variable	0.0131	***	0.0092	***	0.0071	**
	(0.0038)		(0.0028)		(0.0030)	
GDP Growth	0.0007		0.0007		-0.0001	
	(0.0008)		(0.0008)	*	(0.0010)	
Exports (% of GDP)	-0.0010	*	-0.0011		-0.0001	
	(0.0005)		(0.0005)		(0.0007)	
Imports (% of GDP)	0.0019	***	0.0019	***	0.0013	**
	(0.0005)		(0.0005)		(0.0006)	
Government Consumption (% of GDP)	0.0012		0.0009		-0.0007	
	(0.0013)		(0.0013)		(0.0016	
Constant	0.0004		0.0063		0.0277	
	(0.0323)		(0.0329)		(0.0375)	
Number of observations	137		137		125	
R-squared	0.09		0.07		0.09	

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.6: Dismissal policies' impact on unemployment outflow rates, 2008-2013 annual data

	Column A		Column B		Column C
Policy Variable	0.0149	***	-0.0033	***	-0.0015
	(0.0050)		(0.0009)		(0.0011)
GDP Growth	0.0002		0.0001		0.0009 **
	(0.0004)		(0.0004)		(0.0003)
Exports (% of GDP)	-0.0027	***	-0.0016	**	0.0008 **
	(0.0004)		(0.0004)		(0.0004)
Imports (% of GDP)	0.0025	***	0.0018	***	-0.0011 **
	(0.0004)		(0.0005)		(0.0004)
Government Consumption (% of GDP)	-0.0045	***	-0.0052	***	0.00002
	(0.0013)		(0.0013)		(0.0013)
Constant	0.1650	***	0.1718	***	0.0885 **
	(0.0335)		(0.0330)		(0.0341)
Number of observations	135		135		116
R-squared	0.08		0.16		0.34

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.7: Dismissal policies' impact on unemployment inflow rates, 2000-2007 annual data

	Column A		Column B		Column C	
Policy Variable	0.0004		-0.0001		-0.00099	**
	(0.0005)	***	(0.0004)		(0.00043)	
GDP Growth	-0.0004		-0.0004	***	-0.00023	
	(0.0001)		(0.0001)		(0.00014)	
Exports (% of GDP)	0.0001		0.0001		0.000001	
	(0.0001)	**	(0.0001)		(0.00009)	
Imports (% of GDP)	-0.0001		-0.0001	*	-0.00006	
	(0.0001)	***	(0.0001)		(0.00009)	
Government Consumption (% of GDP)	0.0006		0.0006	***	0.00050	**
	(0.0002)		(0.0002)		(0.00022)	
Constant	-0.0006		-0.0012		0.00129	
	(0.0045)		(0.0046)		(0.00526)	
Number of observations	136		136		124	
R-squared	0.003		0.001		0.05	

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.8: Dismissal policies' impact on unemployment inflow rates, 2008-2013 annual data

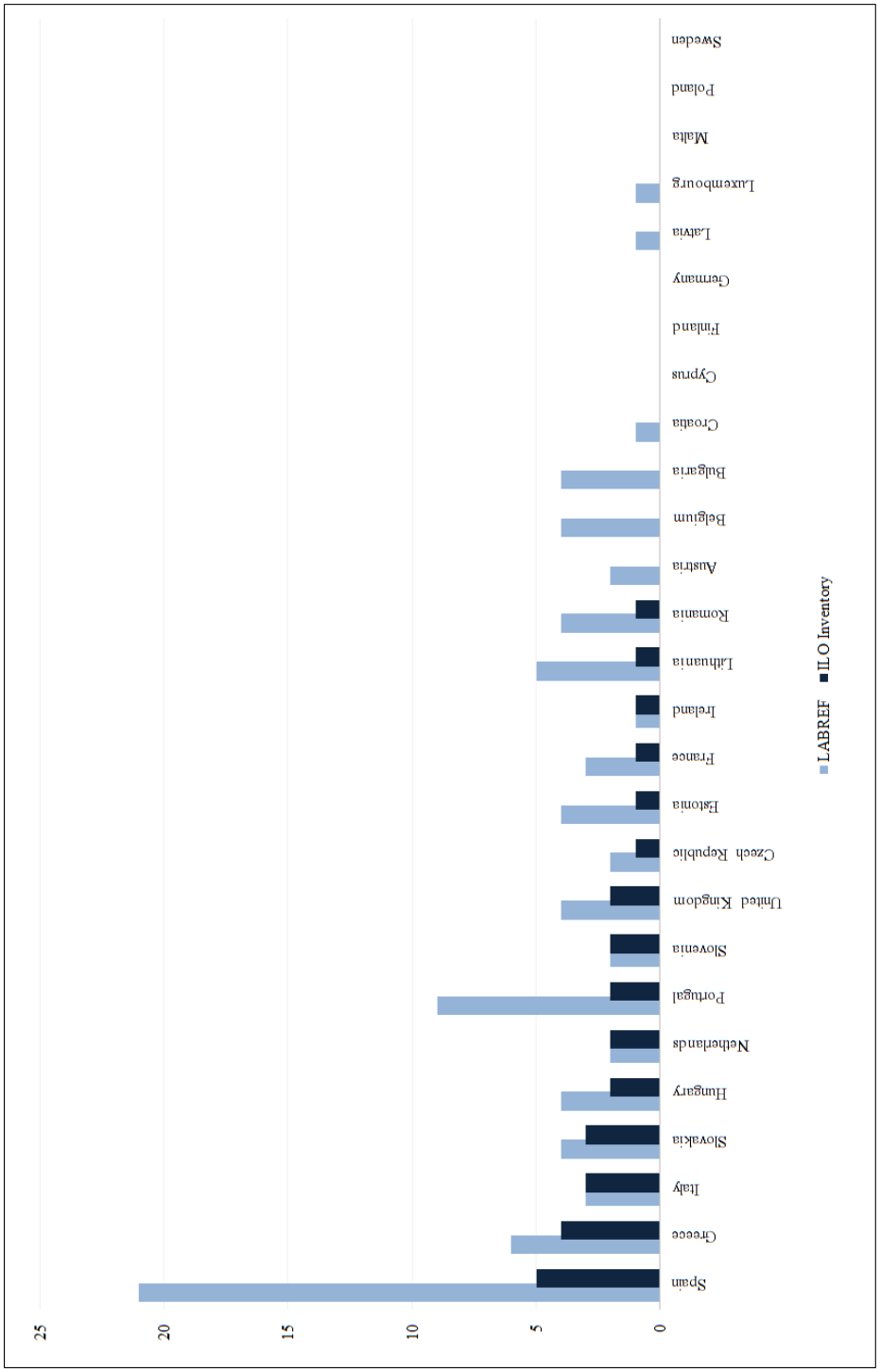
	Column A		Column B		Column C	
Policy Variable	0.00022		-0.000004		0.00029	
	(0.00084)		(0.000159)		(0.00020)	
GDP Growth	-0.00025	***	-0.000251	***	0.00014	**
	(0.00006)		(0.000060)		(0.00006)	
Exports (% of GDP)	0.00006		0.000066		-0.00003	
	(0.00006)		(0.000066)		(0.00007)	
Imports (% of GDP)	0.00001		0.000005		0.00000	
	(0.00007)		(0.000077)		(0.00008)	
Government Consumption (% of GDP)	-0.00017		-0.000167		0.00047	**
	(0.00021)		(0.000216)		(0.00023)	
Constant	0.00784		0.007808		-0.00026	
	(0.00557)		(0.005594)		(0.00617)	
Number of observations	135		135		116	
R-squared	0.07		0.08		0.05	

*,**, *** Indicate coefficient is statistically significant at a 10%, 5% and 1% level respectively.

Table 3.9: Sensitivity Analysis

	Benchmark		(I)		(II)		(III)	
	Sign	Significance	Sign	Significance	Sign	Significance	Sign	Significance
Table 3.1	+	*	+		+	**	+	
Table 3.2	-	**	-		-	***	-	
Table 3.3	+	***	+	***	+	***	+	**
Table 3.4	-	***	-	**	-	***	+	
Table 3.5	+	***	+		+	***	+	*
Table 3.6	-	***	-	*	-	***	-	
Table 3.7	-		+		-		-	
Table 3.8	-		+		+		+	

Figure 3.1: Policy distribution across countries: 2008-2013 averages



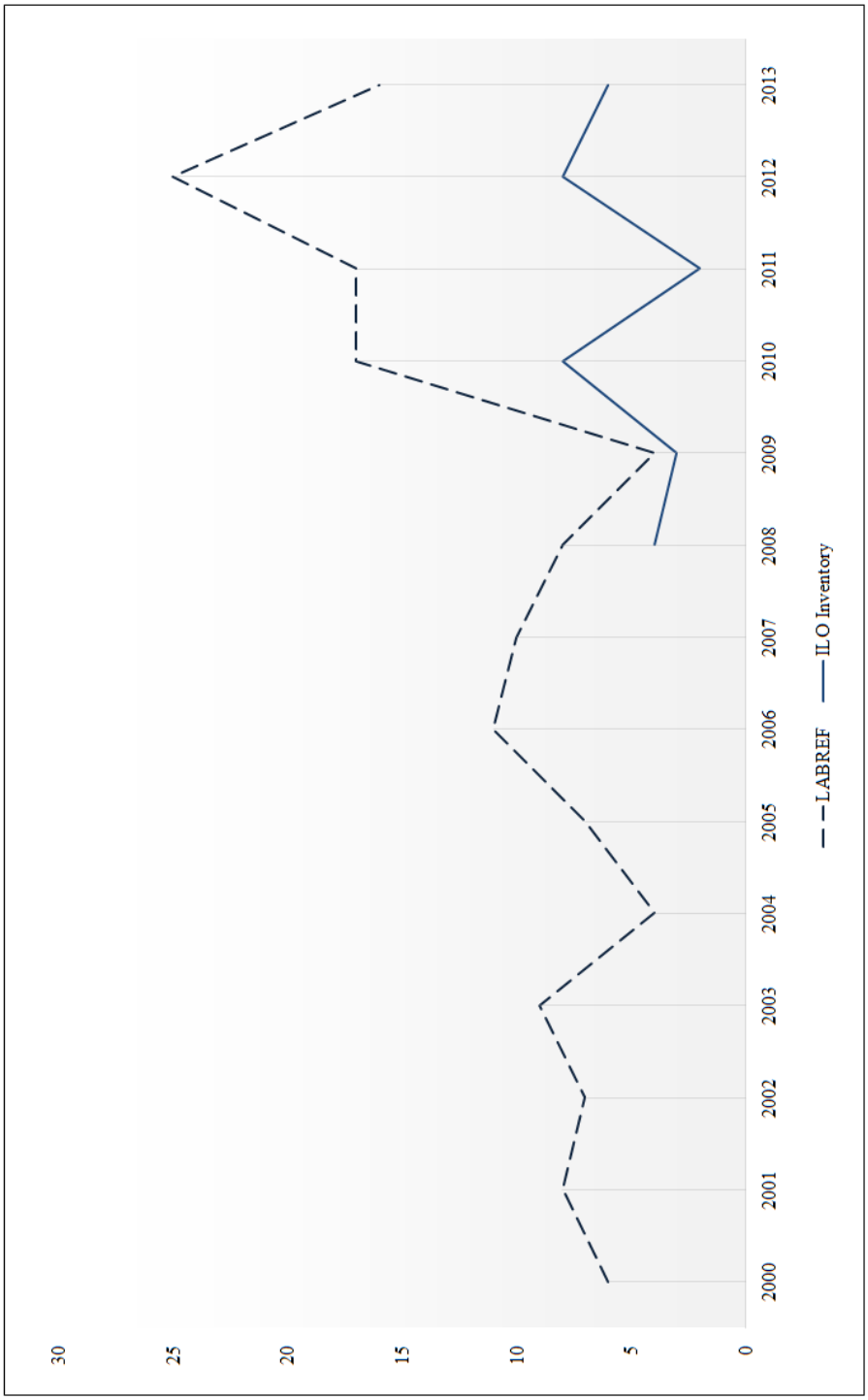


Figure 3.2: Policy distribution over time

Figure 3.3: Policy direction: LABREF (2000-2007)

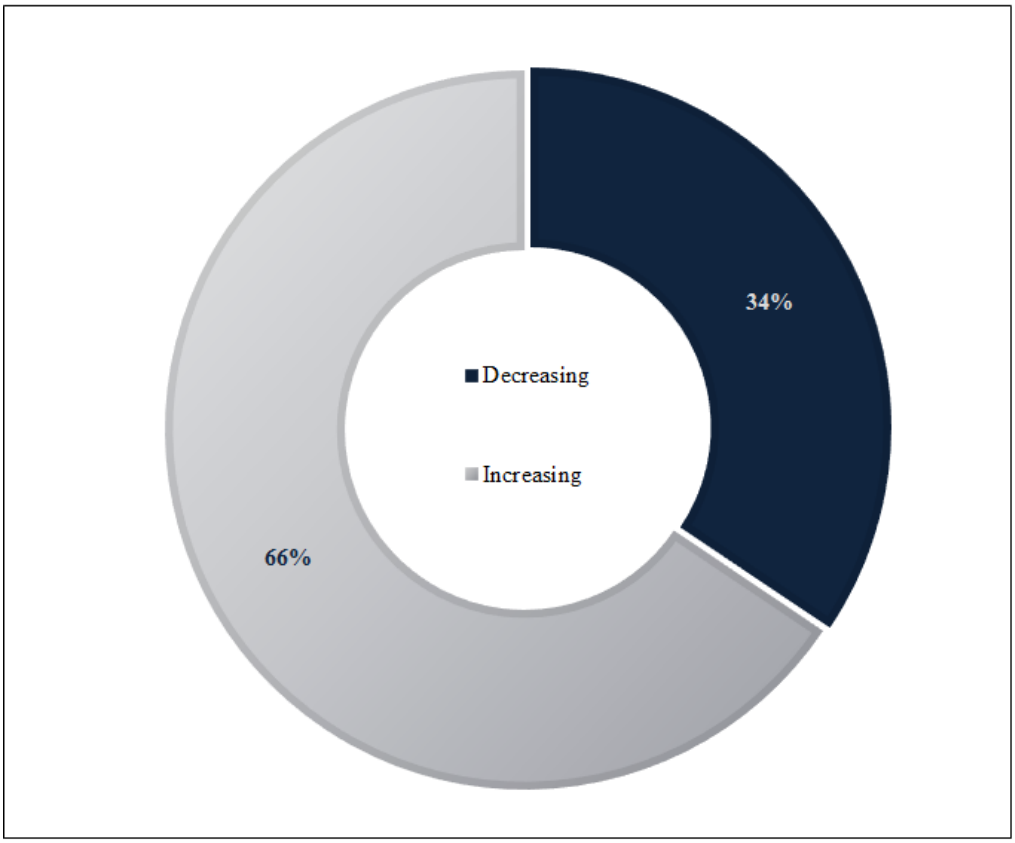


Figure 3.4: Policy direction: LABREF (2008-2013)

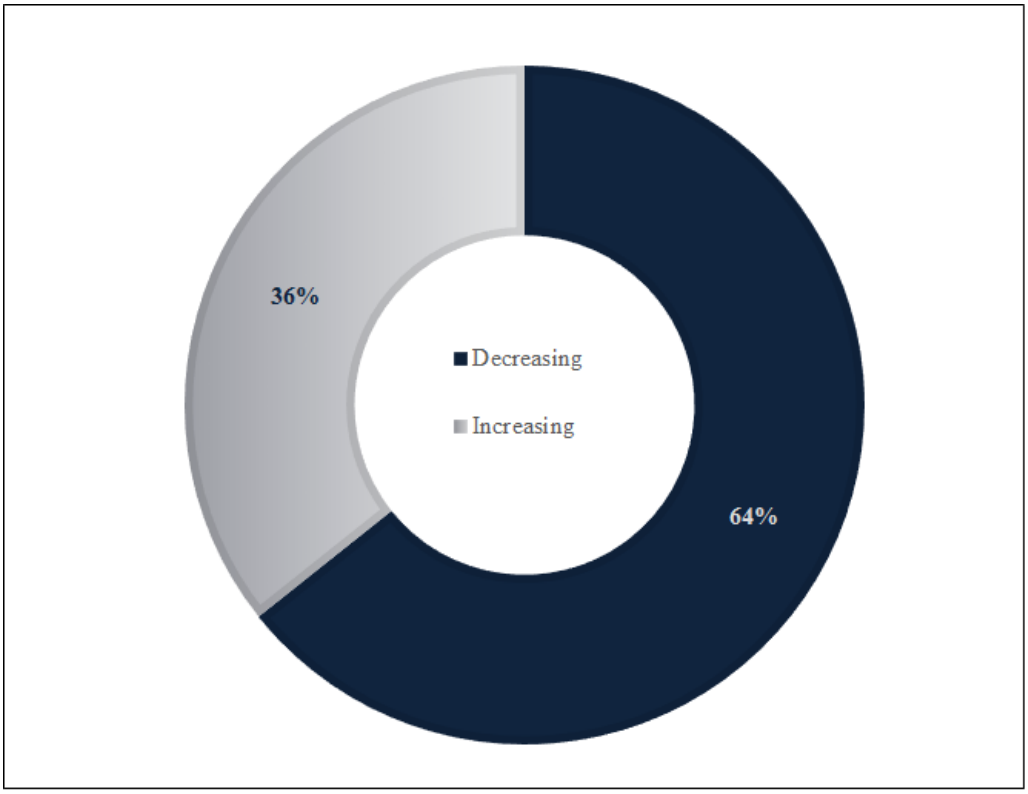


Figure 3.5: Policy direction: ILO Inventory (2008-2013)

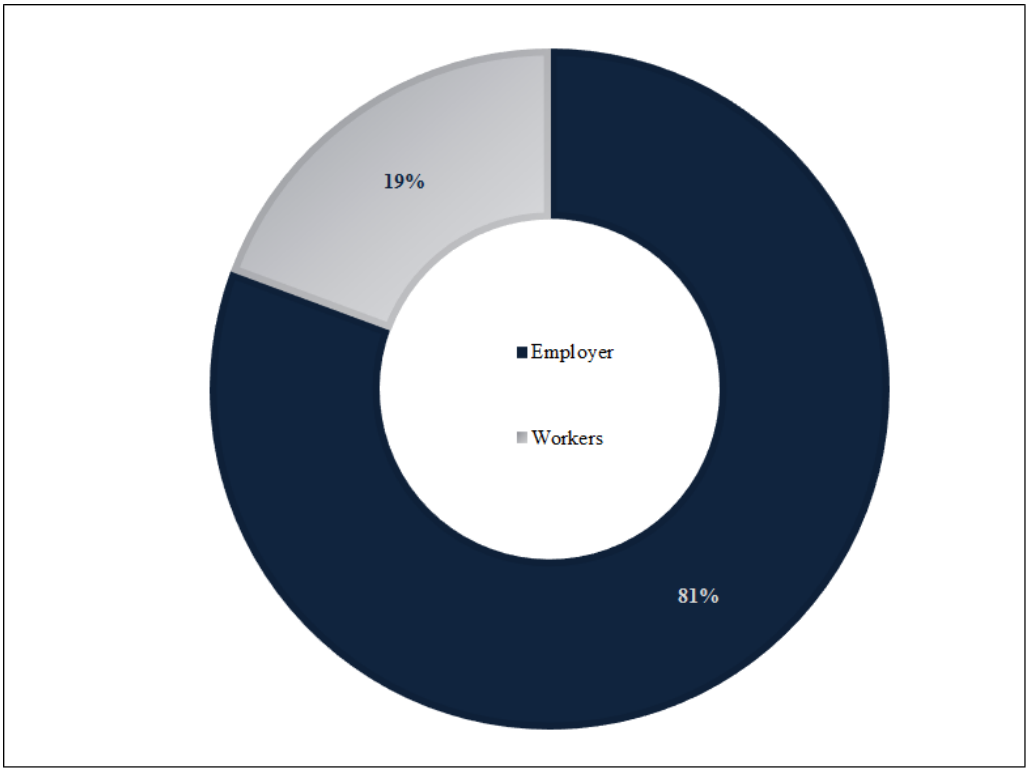
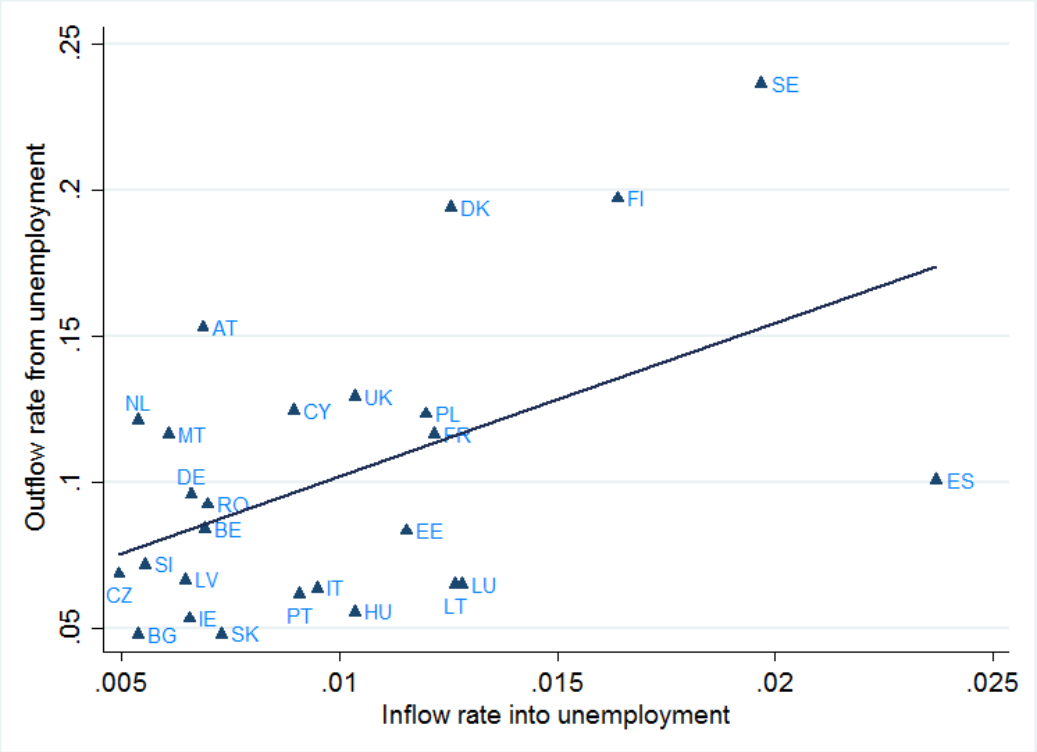


Figure 3.6: Unemployment flow rates' cross country distribution



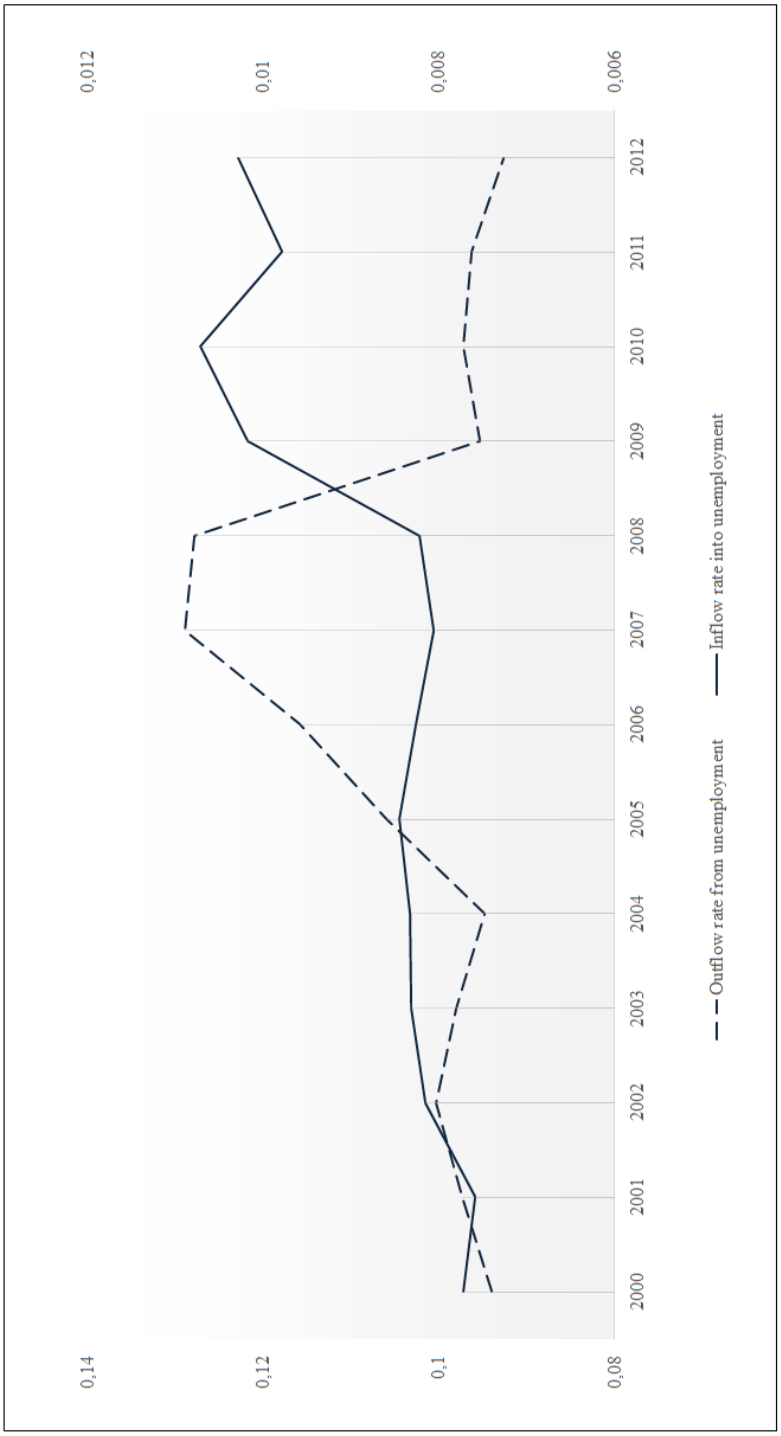


Figure 3.7: Unemployment flow rates' evolution (Unweighted EU-27 average)

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