

Low-skilled Unemployment and the Role of Employment Protection Legislation.

Jenny Bennett
University of Cologne, GK SOCLIFE
Bennett@wiso.uni-koeln.de

work in progress – please do not cite or distribute without permission
** Helpful comments and critique are always welcome **

Abstract¹:

Globalization, structural change and technological progress altered the economic conditions in the European Union and led to an increase in unemployment. This development has intensified unemployment risks in particular for low-skilled workers. The apparent over-regulation of labour markets, especially the extent of employment protection legislation, is often discussed as an additional cause for rising unemployment rates within the EU. While previous studies indicate a minor influence of employment protection on unemployment rates, effects on the unemployment structure turned out to be stronger. The approach of this study aims at offering a coherent theoretical and empirical perspective on unemployment risks due to different skill levels by highlighting the effects of employment protection legislation. Based on EU-SILC survey data from 2007, the study gives insights into the relationship between employment protection legislation and individual unemployment risks across countries including the duration and frequency of unemployment spells. Results of the multi-level analyses show, while employment protection legislation affects low-skilled unemployment, it has no effect on the unemployment risks of highly-skilled individuals. Other forms of labour market regulation, hiring rules for temporary employment and wage restrictions, additionally influence unemployment.

¹ Some minor changes have been made compared to the abstract published at the conference website.

1. Introduction

Labour market conditions have changed. Technological advances, globalization and the expansion of the labour force have strengthened the competition for jobs, especially in the case of low-skilled individuals. The constant change calls for mobility - by employers in terms of their productivity and their factor inputs, by employees regarding their willingness to learn new tasks and to work at changing locations. In this context, the apparent over-regulation of labour markets is often discussed as main cause of high and persistent unemployment. In particular, rigid employment protection legislation (EPL)², as it can be observed in many European countries, has been subject to criticism (see: OECD 1999, 2004; Bertola et al 1999; Boeri et al 2000; Walwei 2002, Zientara 2006; Belot et al. 2002).

On the basis of theoretical considerations, strict firing rules generate both positive and negative employment effects. Positive employment effects result from enhancements in labour productivity and a reduction in transaction costs. Through the establishment of specific dismissal laws, long contract negotiations become obsolete at the beginning of the employment relation (Williamson 1987). Job security, afforded by EPL, additionally increases the extent of human capital investments by workers. In order to obtain investment incentives, workers have to be provided with an appropriate employment guarantee, which protects them against the opportunistic behavior of the employer, so that at least investment costs can be amortized (OECD 2004). Furthermore, strict EPL tends to increase the extent of cooperation. "Job security promotes the identification of staff with the operational objectives, facilitates the transfer of knowledge and skills, increases willingness to perform, promotes in-house mobility and improves - because of low dismissal risks - the acceptance of technological progress" (translated according to Walwei 1996, p. 225). Lacking EPL might, in contrast, result in more frequent strikes, lower willingness to make concessions of the workers' representatives and increasing extent of shirking (ibid.).

In addition to improving allocative efficiency, regulatory measures also aim to improve the distributive justice within the labour market (European Commission 2007a, Nolte 2001). In this context, one target is the reduction of power imbalances resulting from differences in the property of capital and to protect workers from exploitation by their employers. EPL

² EPL is understood here only as direct employment protection through the implementation of firing rules. Indirect employment protection, e.g. by requirements for temporary work, is taken into account separately.

protects employees against arbitrary dismissals and reduces, due to provisions on notice periods and severance payments, financial dependences.

However, the restriction of the flexibility of entrepreneurial activity, which is obtained by strict EPL, is also considered to produce negative employment effects (Addison/Teixeira 2001). By limiting the freedom of action, appropriate responses to economic changes are constrained, particularly in the short run. Compared to labour markets with low requirements on firing rules, employers in strictly regulated markets are restricted in their competitiveness. The comparatively high labour costs might also result in recruitment freezes and / or a shift in foreign markets.

Empirical studies examining the impact of EPL on the unemployment rate, based on the analysis of macro-indicators, detected contrasting results. Evidence for positive and negative employment effects of strict EPL can be found. However, in some studies even no significant relation between EPL and the level of unemployment could be verified (see in detail: Belot et al. 2002; OECD 2004, Addison/Teixeira 2001; Baker et al. 2005; European Commission 2006). Thus, theoretically and empirically it remains unclear how EPL is connected to unemployment. However, there is largely consensus about the fact that EPL reinforces structural differences in unemployment risks. According to Algan and Cahuc (2004) employment protection mainly degrades employment opportunities of women and youth. Scarpetta (1996) found a positive relation between EPL and youth unemployment. The OECD (2004, 2006) detected a negative impact of EPL on youth employment rates. Esping-Anderson (2000) shows that EPL strengthens consolidation of unemployment for low-skilled individuals.

The approach of this study aims at offering a coherent theoretical and empirical perspective on the unemployment risks for low-skilled individuals. However, this effect is expected to be influenced by its impact on the employment opportunities of the highly-skilled. Therefore, the effects of EPL on the unemployment risks of both low- and highly-skilled individuals are highlighted. The paper also gives some insights into the frequency and duration of unemployment spells associated with levels of EPL. As methodological approach, I use multi-level analysis based on data from the EU SILC survey in 2007. By using this method, country differences based on economic conditions and labour market regulation as well the composition of the labour force, are taken into account. The paper contributes, at least, in three ways to the ongoing deregulation discussion: it highlights cross-level interactions between EPL and individual unemployment risks, it concentrates on differences due to skill levels and it controls for economic conditions and other forms of labour market regulation (hiring rules for temporary employment and wage restrictions).

The structure of the paper is organized as follows. In section 2, I discuss the theoretical mechanisms associated with EPL and its varying influences on unemployment risks for low- and highly-skilled individuals. Section 3 mentions data and methods applied. Results are presented in section 4. Section 5 concludes with a critical discussion.

2. Low-skilled Unemployment: The role of Employment Protection Legislation

The development of labour markets has strengthened the unemployment risks particularly for low-skilled workers. Due to structural change, jobs offered in the primary and secondary sector decrease. Achieved knowledge on these fields becomes obsolete. On the same time, new skills are needed to fulfill the requirements in the service sector and new established branches. As a consequence of the technological progress, these new jobs demand rather higher levels of qualification (Iversen/Cusack 2000). Unemployment risks for low-skilled workers have furthermore increased with the relocation of production processes to non-European countries.

Labour market opportunities are furthermore influenced by the degree of labour market regulation. The following chapter highlights the effects of strict firing rules on the distribution of unemployment risks related to different skill levels. Influences on low-skilled individuals are affected by the effects of EPL on highly-skilled workers. Therefore, both skill groups are taken into account. Unemployment risks are, furthermore, discussed in terms of unemployment incidence and persistence. Potential interactions with implemented hiring rules and wage systems are also considered.

2.1. Employment Protection Legislation

EPL is associated with restrictions on the employer's ability to fire at will. This includes directives for procedural requirements and severance payments. As other regulatory measures, dismissal rules increase labour costs (Addison/Teixeira 2001). According to the neoclassical employment theory, this leads to a decline in labour demand. Following this assumption, unemployment risks have to increase for all individuals the stricter dismissal rules are. However, hiring decisions depend on the employer's expectation that the additional labour costs caused by strict firing rules will be compensated in the future (OECD 2004). As the following considerations show, these expectations vary due to individual skill levels. Furthermore,

firing rules themselves influence labour productivity. Again, there are differences associated with the extent of human capital accumulation.

Strict firing rules promote the employees with job security. Assuming that workers behave reciprocally (Homans 1958; Blau 1964) one may expect employees to respond protection with higher levels of cooperation. The added value for the company resulting from an increased level of cooperation depends on how important cooperation in the production process is. The more ambiguous and unstructured the task is and the higher the required skill levels are, the more difficult the monitoring of performance is (Jones 1984). Productivity benefits from strict firing rules thus derives priority for high-skilled workers.

Job security gained by strict dismissal restriction further provides incentives for workers to invest in firm-specific human capital (OECD 2004). Firm-specific human capital increases the individual value added. The higher the worker's productivity in the company, the smaller the incentive to terminate is. Therefore, the longer tenure lasts, the lower the risk of being fired is. Elderly, whose seniority is usually larger, have productivity advantages compared to younger employees. Since the rates of productivity increase in addition with the degree of skill, dismissal risks - for the same seniority - decrease more for highly-skilled than for low-skilled workers (Layte et al. 2002; Nolte 2001). Due to the productivity expectations of the employer, hiring decisions are again positively influenced for highly-skilled workers by strict firing rules. In contrast, low-skilled people suffer on hiring disadvantages. Employers do not expect them to compensate the costs associated with strict firing rules. Thus, entering and reentering the labour market from non-employment is harder for unqualified individuals the more rigid EPL is. Moreover, also the differences in employment opportunities between low and highly-skilled people are strengthened the stricter the implemented firing rules are.

On the other hand, strict firing rules might reduce the number of dismissal within a company. From the viewpoint of an employer, an effective dismissal occurs whenever the marginal return of an employee is negative, but the costs of continued employment are positive (Nolte 2001). Dismissal regulations increase separation costs, for example by severance payments, and thus delay the optimal moment of a dismissal in a company. Is work due to less quantity demanded less productive (reducing the marginal productivity) while easily replaceable, a reduction in labour demand follows through redundancies. In general, labour demand for simple activities is more price elastic. According to Davis and Reeve (1997), the more easily input factors are substitutable, the more it responds to price fluctuations (here: in terms of decreasing marginal labour productivity). In the case of highly-skilled workers, one may assume that the elasticity of

labour demand is low. Replacement in the event of another economic boom is expensive or beyond that highly-skilled employees might be even indispensable as important service providers for the production process of the company. The number of layoffs due to declines in consumer demand is therefore, at least in the short run, particularly reduced for unskilled workers.

Regulations on employment protection can also be made at the individual level (Walwei 2002). This is especially the case when the employer himself has an interest in a long and stable employment relationship. Because of their comparably high productivity and low substitutability, qualified workers should be particularly able to negotiate employment protection agreements within individual contracts.

2.2 Interactions: Hiring rules and wage restrictions

The impact of employment protection legislation on individual unemployment risks depends on the implementation of other regulatory measures (Esping-Anderson 2000). A great deal of flexibility in other areas, like requirements for temporary employment or wage setting systems, might influence the effectiveness of EPL. Firing rules, therefore, have always to be considered in their environment of other regulatory measures.

Hiring rules set requirements to justify temporary employment relationships (OECD 2004). In the case of temporary employment the duration of employment is fixed at the outset. A separation occurs when time passed or the reason of employment falls away. In both cases, there is no monetary compensation payable by the employer. In this way, strict firing rules can be circumvented. Temporary employment forms allow a more flexible adaptation of the workforce on changing economic conditions compared to regular employment. By reducing labour turnover costs, the recruitment of additional manpower becomes more attractive to the employer. This decreases the risk for long-term unemployment. For the individual worker, however, the risk to switch over to unemployment after the contract ends increases if a new and suitable job is not found directly (search unemployment). The temporary employment also prevents the accumulation of firm-specific human capital, so it can be assumed that fixed-term contracts are awarded mainly in unskilled work. Are hiring rules rigid, however, restrictive firing rules for regularly employment can be largely applied.

Another regulatory influence affecting the impact of EPL stems from the extent of wage restrictions. Generally, wages determine the quantity of labour demanded. If wages cannot be adjusted downward as a consequence of falling marginal productivity, the demanded amount of labour decreases.

Do workers receive, as a result of union agreements or statutory rules, wages that are above the market equilibrium wage, this also leads to a reduction of labour and unemployment rises (Borjas 2000). Wages are usually determined by collective bargaining. In this context, one may assume that the more central the negotiations take place, the less discrete entrepreneurial needs are taken into account (Enste / Hardege 2006). Negative employment effects of rigid EPL can be compensated by downward adjustments of wages. This is only possible if the wage system is sufficiently flexible.

2.3 Hypotheses

The main objective of this paper is to determine cross-level interaction effects. Specifically, the study focuses on the question of how EPL affects unemployment risks in association with individual skill-levels. Basically, as a result of increased labour costs, one may expect negative employment effects. However, these effects are likely to vary by human capital accumulation. Theoretical considerations have shown that mainly the career opportunities of the low-skilled are negatively affected by strict regulation. If the market is impenetrable, the turnover rates decrease and a consolidation of long-term unemployment results. At the same time, due to rising labour turnover costs, the number of unemployment periods decreases. Existing employment contracts are terminated less frequently. Strict EPL thus results in both positive and negative employment effects for the low-skilled individuals. To what extent the unemployment risks are influenced in total remains unclear.

However, there are other labour market mechanisms that are likely to strengthen the consolidation of unemployment, so that one may expect the negative effects to dominate. Hints are provided, for instance, by the insider / outsider theory by Lindbeck and Snower (1987). Employees (insiders) have advantages in bargaining power due to the existing labour turnover costs that they can use towards the unemployed (outsiders). The flexibility in wage negotiations is determined by the differences between the reservation wages of outsiders and the value of marginal product of insiders together with the fluctuation costs that arise in the context of personnel change. In addition, insiders have the possibility to protect their jobs against outsiders due to strategic behavior. Insiders can mutually cooperate in the production process, while refusing to cooperate with outsiders who work at a lower wage and thereby reducing their effort. Another strategy is the poor treatment of novices in an otherwise friendly work environment. The psychological costs arising from this harassment raise the origin height of reservation wages, so that the bargaining power of insiders grows. These

mechanisms additionally strengthen difficulties of reentering the labour market. Thus, the positive effects on unemployment persistence are considered to overwhelm the negative effects on unemployment incidence, so that in all, stricter labour market regulation is expected to lead to a higher probability of being unemployed for unqualified workers.

Human capital theory also states that the productivity decreases, the longer unemployment lasts. The reason for this is the depreciation of human capital through forgetting or unlearning. Knowledge can also become obsolete by technological progress. Therewith, possibilities to compensate the costs arising from strict firing rules decrease.

In the case of highly-skilled individuals, one may assume that they are able to take advantage of the positive employment effects resulting from strict EPL. Additionally, because of the low elasticity of price, the number of potential unemployment periods is supposed to be not affected for highly-skilled individuals. Thus, negative employment effects resulting from the cost of EPL can be compensated. It is also likely that the highly qualified have more bargaining power because of their knowledge and productivity in comparison to the low skilled. It is expected, therefore, that they are able to negotiate provisions for firing rules that protect them against arbitrary dismissal within individual contract bargaining. Unemployment risks of high-skilled should therefore not be influenced by the strictness of EPL, neither the duration nor the incidence of unemployment periods.

It is also expected that regulatory measures, such as requirements for hiring rules and restrictions on wages, have an influence on the effectiveness of EPL. Negative employment effects for the low-skilled arising from strict firing rules can be mitigated through flexible hiring rules and wage systems. Strict EPL might be circumvented, for instance, by the use of temporary work arrangements. In addition, to avoid negative employment effects, employers could compensate dismissal rules with wage cuts. Conversely, the stricter the hiring rules are, the stronger the effects of rigid EPL on individual unemployment risks are. The same applies to the rigidity of the wage system. The various regulatory measures are able to strengthen each other. Figure 1 summarizes the hypotheses.

Figure 1: Hypotheses

H1: The stricter EPL is, the higher the probability of being unemployed for low-skilled individuals is.

H1a: The stricter EPL is, the longer unemployment lasts.

H1b: The stricter EPL is, the less unemployment periods occur.

H2: There is no influence of EPL on the unemployment risks of highly-skilled individuals

H3: Employment effects of strict firing rules are strengthened the more rigid hiring rules or wage restrictions are.

3. Data and methods

3.1. Data

The analysis is based on data from the EU-SILC survey (European Union survey on income and living conditions) collected in 2007 (EU-SILC 2010). The main aim of the survey is to give insights into topics of income, poverty, social exclusion and living conditions. This also includes individual information on unemployment. Data is used from 22 different countries belonging to the EU (AT, BE, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LU, NL, PL, PT, SE, SI, SK, UK) plus Norway.³ I concentrate on the civilian labour force aged between 16 and 64 inclusively.⁴

The unemployment risk, the main dependent variable of the analysis, is measured by the likelihood of being unemployed. For this purpose, I build a dichotomous variable, which is derived from the self-defined economic status of the respondents. If the respondent was unemployment at the time of the interview, the variable is scored 1 otherwise 0.

Unemployment incidence and persistence are derived from information on the reference year (the year before the interview took place). Respondents had to specify their main employment activity for each month. In this context, unemployment incidence is derived by the number of unemployment periods with the reference year. Unemployment persistence is operationalized by the mean duration of an unemployment period.

³ Cyprus and Island had to be excluded because of missing information on the macro level.

⁴ People in education, retirement, compulsory military communities or service, people fulfilling domestic tasks and care responsibilities, being permanent disabled or unfit to work or people who are economically inactive for other reasons are excluded from the analysis.

Unfortunately, data does not provide information about the time point when unemployment has actually started. Therefore, it is not possible to give real evidence on differences in unemployment duration due to the strictness of EPL.

The skill-level is operationalized by the ISCED-97 scheme, which categorizes individual skills into seven classes according to their degree of education and vocational training (UNESCO 2010). For my analysis, I created three ISCED variables, summing up pre-primary, primary and lower secondary education into one variable, upper secondary and post-secondary non tertiary education in another variable, and first and second stage of tertiary education into the third variable. The former represents low-skilled, the latter highly-skilled individuals.

As additional control variables, I check for age, gender and migration background. Age is divided into three age-groups: 15 to 29 years, 30 to 49 years and 50 to 64 years. Migration background is derived from information on the country of birth: born in the country of residence, EU, outside the EU.

At the macro level, the main independent variable is EPL. In order to operationalize the strictness of firing rules, I resort to indices provided by the OECD (Venn 2009). Firing rules here encompass restrictions for regular employment and additional requirements for collective dismissal.⁵ The index consists of information on procedural processes, compensation payments, notice periods, and the difficulty of dismissal. The latter is furthermore described by legitimated dismissal rules as well by the difficulties of enforcement.

In order to control for influences of other regulatory measures, the rigidity of hiring rules and wage systems are taken into account. Measures for hiring rules are also provided by the OECD (Venn 2009). They include legal reasons for fixed term and temporary work agency employment, the number of renewable contracts and the maximum cumulated duration of these kinds of employment. Indicators for firing and hiring rules both were valued on a scale from 0 to 6 and then, to construct the indices, summarized by its averages. Wage restrictions are operationalized by the degree of centralization of wage bargaining. The more centralized wage bargaining is (the less entrepreneurial needs are taken into account), the stricter the regulation of the wage system is. Data is taken from the ICTWSS Database (Visser 2009). The variable is scored 0, if bargaining takes place at the local

⁵ In dependence on the Employment Protection Legislation Indicator created and used by the OECD (Venn 2009), rules for collective dismissal have weight of 0.4, while the weight of dismissal rules for regular employment is weighted by 1.

or company level, 1 if the dominant level of wage bargaining is the sectoral or industry level and 2 if it takes place mainly on national or central level.

At the macro level, it is additionally controlled for the innovative performance of the economy. Therefore, the Summary Innovation Index (SII) provided by the European Commission (2007b) is used. The SII encompasses five key dimensions to cover various aspects of the innovation process: 1. structural conditions required for innovation potential (innovation drivers), 2. investments in R&D activities (knowledge creation), 3. efforts towards innovation at the firm level (innovation & entrepreneurship), 4. performance expressed in terms of labour and business activities and their value added in innovative sectors (applications) and 5. achieved results in terms of successful know-how (intellectual property). All macro variables refer to the year 2007.

3.2 Methodology

The analysis focuses on potential cross-level effects of EPL (macro level) on the unemployment risks of differently skilled individuals (micro level). Unfortunately, the cross-sectional structure of the data does not provide enough variation between countries to use multivariate models⁶. Therefore, differences in unemployment incidence (H1a) and persistence (H1b) are presented by using descriptive statistics and bivariate methods of analysis. So, at least, an overview on both aspects is provided.

However, by estimating the likelihood of unemployment in general, the multilevel model may be regarded as adequate research instrument to verify the potential cross-level effects stated in hypotheses H1, H2 and H3. Multi-level regressions allow the estimation of variations at various levels simultaneously (Raudenbush/Bryk 2002). Moreover, models enable the examination of compositional effects derived by the structure of the labour force. Differences in the age-structure and degree of female employment are taken into account. Multi-level models provide, therefore, an additional advantage over regression techniques using only aggregated variables (for instance: Belot et al. 2002; OECD 2004, Addison/Teixeira 2001; Baker et al. 2005).

Because the likelihood of unemployment is measured by a dichotomous variable, a binary-logistic multi-level model has to be calculated in order to account for the non-linearity of the outcome variable. This happens by means of the logit link function (ebd):

⁶ The proportion of the country level variance on the total variance is in both cases less than 5 percent.

$$\text{(Level 1)} \quad \eta_{ij} = \log\left(\frac{\varphi_{ij}}{1-\varphi_{ij}}\right) = \beta_{0j} + \beta_{1j}x_{1j}, \quad [1]$$

where η_{ij} is the log of the odds of success and φ_{ij} is the probability that the observed event (here: being unemployed) occurs. The term on the right of the equation includes the structural model. β_{0j} represents the context dependent regression intercept, β_{1j} the regression slope and x_{1j} the micro level predictor.

The structural equation of the macro level models corresponds to the equation of a linear multi-level model. Intercept and slope are assumed to vary by context. Variance can be explained, at least partially, by specific context characteristics:

$$\text{(Level 2)} \quad \beta_{0j} = \gamma_{00} + \gamma_{01}W_j + u_{0j} \quad [2]$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}W_j + u_{1j} \quad [3]$$

The regression intercept β_{0j} encompasses for every country j a context independent intercept γ_{00} plus a slope γ_{01} , a macro level predictor W_j and the residual term u_{0j} . The regression slope β_{1j} is derived by the mean of all country specific slopes under the control of the context effect resulting from the macro level predictor W_j . Equations [2] and [3] both describe cross-level interaction effects.

4. Results

4.1. Unemployment incidence and persistence

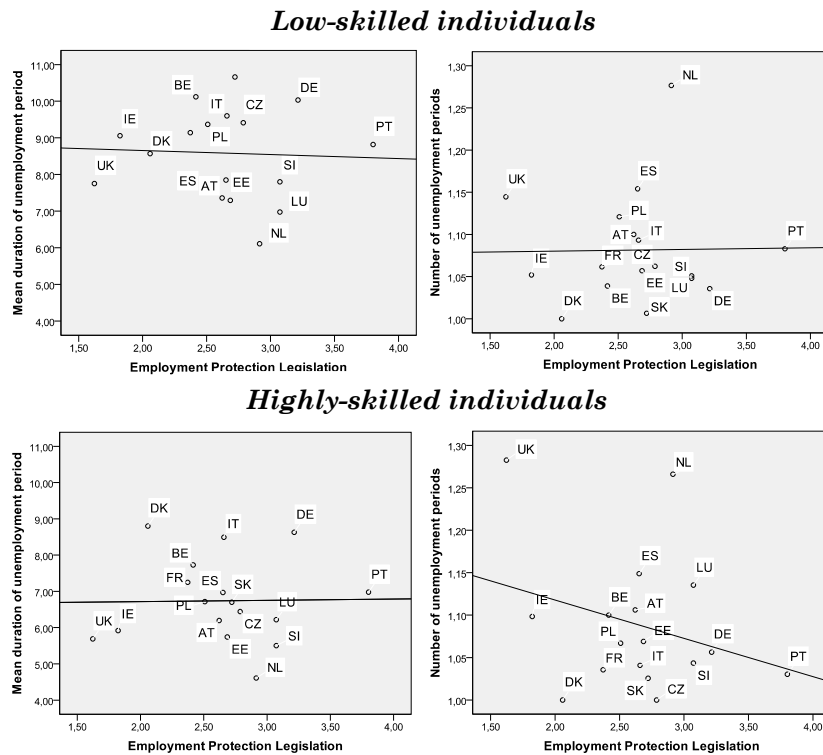
Before presenting the outcomes of the multi-level analyses, results on unemployment persistence and incidence are described. Individuals are grouped into two categories: low-skilled and highly-skilled individuals. Table A (see appendix) shows the mean duration of an unemployment period (unemployment persistence) and the number of unemployment periods measured within the reference year (unemployment incidence). Finland, Greece, Hungary, Norway and Sweden did not provide this information and, thus, have to be excluded. Results are, furthermore, derived only from those individuals who experienced at least one month of unemployment. Therewith, biasing influences of a particularly high or low unemployment rate are taken into account.

The number of month spend in unemployment within an unemployment period varies from 6.11 (NL) to 10.66 (SK) for the low-skilled. On average, 8.58 months are spent in unemployment. Highly-skilled

individuals show less unemployment persistence. On average, they stay 6.74 month in unemployment per period. The range varies from 4.61 (NL) to 8.80 (DK). In some countries, there are large differences between low- and highly-skilled individuals. In Slovakia, for instance, the difference is nearly 4 months. In Denmark⁷, Spain and Luxembourg it is less than one.

Concerning unemployment incidence, there are only low variations between countries. The low-skilled experience on average 1.08 unemployment periods within the reference year. Range varies from 1.00 (DK) to 1.28 (NL). With on average 1.09 unemployment periods, highly-skilled individuals are even more often unemployed. However, differences are only marginal. Numbers differ from 1.00 (DK) to 1.28 (SK).

Fig. 2: EPL and its impact on unemployment persistence and incidence



Source: EU-SILC 2007

Bivariate correlations (Fig. 2) show if there is any observable impact between EPL and the duration or number of unemployment periods. On the basis of the EU-SILC cross-sectional data, no relation can be found. Although there seems to be some kind of negative impact between EPL and the number of unemployment periods for the highly-skilled, the relation is not significant. Probably, data does not provide enough variation between

⁷ Denmark is the only country where time spend in unemployment is bigger for highly- than for low-skilled individuals.

countries. It is important to note that figures are derived and counted on the basis of the monthly information the respondents gave. It is only a cut-out of the whole picture of unemployment persistence and incidence. For instance, unemployment duration of people staying longer than 12 month in unemployment after the reference periods ends or people starting unemployment before the reference period begins cannot be taken into account adequately. In the case of unemployment incidence, we even find less variation. Again, information provided through the monthly reported employment status is only limited. In order to measure real differences in unemployment incidence, time span has to be larger. Temporary employment contracts are often longer than one year. Country variances might be stronger if the employment activity within several years is compared.

Thus, cross-sectional data, therefore, only gives a hint on differences in unemployment persistence and incidence between countries. It is not possible to identify actual relations between EPL and attributes of unemployment.

4.2 Individual unemployment risks

Unemployment rates between low- and highly-skilled individuals vary a lot. On average, based on EU-SILC data, the unemployment rate for the low-skilled is 16.48 percent and only 3.94 percent for the highly-skilled. Between and within countries, there are large differences (see Tab. A)

As research method, to verify hypotheses H1, H2 and H3, logistic multi-level regression analysis is applied. In order to avoid three-way interaction effects, models are estimated for highly- and low-skilled people separately. For each group the main effects of EPL are calculated under control of age, gender, country of birth and the innovative performance of the economy. A further model additionally takes potential interaction effects with hiring rules and wage restrictions into account. All macro variables are transformed so that their actual minimum values observable over all countries are scored 0.

At first, Intra-Class-Correlations (ICC) are calculated on the basis of ANOVA-models (M0, M3). The ICC shows to what proportion the total variance of the unemployment risk is explained by country level differences⁸. For the low-skilled we have an ICC of 12.63 percent, for the highly-skilled of 11.17 percent.

⁸ For logistic multi-level models, ICC is calculated as follows: $\sigma^2_{u_{oj}} / (\sigma^2_{u_{oj}} + \frac{\pi^2}{3})$. For low-skilled individuals this is $(0.4753 / 0.4753 + \frac{\pi^2}{3})$, for highly-skilled $(0.4136 / 0.4136 + \frac{\pi^2}{3})$.

In table 1, the results of the multi-level analyses are presented. Models M0 to M2 show results for low-skilled, models M3 to M5 for highly-skilled individuals (for individual coefficients, see tables B.1/B.2) In M1, the effect of firing rules on the likelihood of being unemployed is not significant. Only after controlling additionally for hiring rules and wage restrictions and their interactions with EPL, we can observe a significant positive effect. An increase in EPL of one unit leads to an increase in unemployment. Low-skilled people in countries with a score one scale point above the minimum suffer on a risk 1.646 times higher than in countries with the most flexible firing rules. In other words, the probability to be unemployed of 15 percent, derived from the intercept, increases by 8 percentage points⁹. While there is no significant main effect of hiring rules, an increase of wage restrictions by one unit also leads to higher individual unemployment risks. Unlike expected, the interaction effect between hiring and firing rules is negative. A simultaneous increase of both regulatory measures of one unit decreases the likelihood of being unemployed. Interaction effects between firing rules and wage restriction occur only at random. In both models (M1, M2) the likelihood of being unemployed depends on the innovative performance of the national economy. The higher innovation performance is, the lower the probability of unemployment is.

Tab. 1: Individual unemployment risks

	ISCED 0-2						ISCED5-6					
	M0		M1		M2		M3		M4		M5	
Fixed effects	Logit Link	Odds ratio	Logit Link	Odds ratio	Logit Link	Odds ratio	Logit Link	Odds ratio	Logit Link	Odds ratio	Logit Link	Odds ratio
Intercept	-1.697 ***	0.183	-1.283 ***	0.277	-1.717 ***	0.180	-3.219 ***	0.040	-3.732 ***	0.024	-4.371 ***	0.013
LEVEL 2												
Firing rules			-0.045	0.956	0.498 *	1.646			0.372 *	1.451	0.466	1.594
Hiring rules					0.191	1.210					0.335 **	1.398
Wage restrictions					0.219 **	1.245					0.253 **	1.288
Firing*Hiring					-0.396 **	0.673					-0.185	0.831
Firing*Wage					0.039	1.040					0.056	1.057
Innovation			-0.224 **	0.799	-0.236 ***	0.790			-0.090	0.914	-0.085	0.918
Variance components	0.4753		0.4334		0.4565		0.4136		0.3973		0.4100	
degrees of freedom	19		19		15		21		19		15	
Level 1 units	47024		47024		47024		59220		59220		59220	
Level 2 units	22		22		22		22		22		22	

Source: EU-SILC 2007, population average model, individual reference categories: female, 30-49 years, born in the country of residence

⁹ Form to calculate the probability of Y=1: $\varphi_{ij} = \frac{1}{1+\exp\{-\eta_{ij}\}}$

For the highly-skilled we can observe a significant and positive effect of EPL on the likelihood to be unemployed if only controlling for innovative performance. The individual unemployment risk is 1.451 times as high in countries where firing rules score 1 unit over the minimum value of EPL compared to countries where firing rules are most flexible. The likelihood to be unemployed increases from originally 2 percent (derived from the intercept in M3) by 1 percentage point. After controlling for hiring rules and wage restrictions, the effect loses significance. Now, only an increase of one unit in hiring rules and wage restrictions lead to an increase in the individual unemployment risks. Interactions are not significant. In contrast to the low-skilled, employment opportunities are not affected by the level of innovative performance.

5. Discussion

The results clearly show that unemployment risks for highly-skilled individuals are much lower than for the low-skilled. The results also provide evidence that the impact of EPL and unemployment varies due to different human capital accumulation.

For the highly-skilled, as expected, after controlling for hiring rules and wage restrictions, there is no significant effect of firing rules on the probability of being unemployed. However, the stricter regulations on temporary employment are, the higher the unemployment risk within this group is. The fact, that the effect of EPL loses its significance after controlling for hiring rules might indicate that employers use temporary employment to circumvent dismissal rules for regular employment. Therefore, it is a meaningful opportunity to promote qualified work and to shed employment barriers.

Derived from this result, one may also assume that employers have a need for both temporary (time- or project-related) and regular employment. While temporary employment is controlled by hiring rules, regular employment is subject to firing rules. That no significant effects can be detected in the latter is due to the fact that highly-skilled workers are able to compensate negative employment effects arising from high labour costs by an increased level of productivity. Under the assumption that rigid employment protection leads particularly for the highly-skilled to greater cooperation and increased levels of firm-specific human capital investments, employers also have an interest, at least in the long run, in stable and long-lasting employment relations with this group.

Wage restrictions also increase unemployment risks of the highly-skilled. The more centralized wage negotiations proceed, i.e. the less individual entrepreneurial needs are taken into account, the higher the

unemployment risks are. Wage restrictions, however, lead primarily to a redistribution of rents from the highly- to the low-skilled. In order to satisfy higher wage demands for unskilled labour, wages for qualified labour have to be squeezed (Acemoglu 1997). Basically, an employment-boosting effect would have been expected for the highly-skilled. However, if wage restrictions leads to great reductions of the overall labour demand, the labour demand for highly-skilled labour might also decrease. Interactions between the different regulatory measures are not observed. The innovative performance of the economy furthermore does not affect unemployment risks for highly qualified individuals. Thus, employment opportunities for qualified labour do not depend on the economic development within the country.

In contrast, unemployment risks of the low-skilled are, as expected, positively influenced by EPL. The stricter the firing rules are, the greater the likelihood of being unemployed is. Negative employment effects resulting from increased labour costs cannot be compensated. The outcomes for the highly-skilled support the theoretical considerations. Positive employment effects are mainly acquired by qualified individuals.

Hiring rules have no influence on the low-skilled unemployment. The ability to find a new job quickly and the risk to be unemployed more often after temporary employment ends may offset each other so that the overall employment effect is zero.

Wage restrictions also increase the risk of unemployment. As already mentioned above, low-skilled wages are assumed to benefit primarily from rigid pay systems. Rising wages therefore leads to a reduction in labour demand for unskilled-work. Since the results also have shown a positive effect on unemployment risks of the highly-skilled, it is likely that total employment is negatively affected by wage restrictions.

Contrary to the hypothesis set, the interaction between hiring and firing rules has a negative effect on the unemployment risk for the low-skilled. If both regulations increase by one unit, unemployment risk decrease and the employment inhibiting effect of strict firing rules is substantially weakened. At first, this result is rather counterintuitive. Are both regulatory measures strict, termination is difficult and expensively. Accordingly, it is expected that the recruitment incentives are small. Presumably, this result might be explained by further, not examined moderator variable, which points to a specific labour regime. A labour regime that is especially rigid and intervenes sustainably on the market mechanism, for instance to restore social justice; the regime might at the same time also try to compensate the negative employment effects resulting from strict labour market regulation. High subsidies, for instance in form of job creation schemes and fringe benefits, may facilitate unqualified labour.

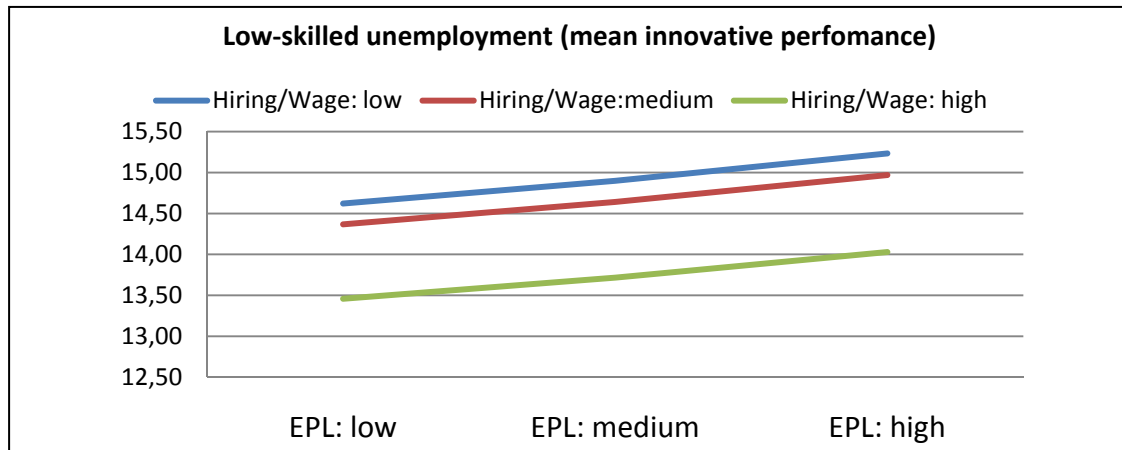
By now, this explanation is nothing more than an assumption. To clarify this impact, some additional work has to be invested.

An interaction between firing rules and wage restrictions is not observable. Unlike what was expected, strict firing rules cannot be compensated by low wages. A limitation that has to be noted in this context is, however, the suitability of the variable measuring wage restrictions. Because actual wage differences are not taken into account, the predictor might be not appropriate to verify this mechanism. However, differences in monetary systems and the economic conditions make it difficult to apply an adequate indicator for cross-country analysis measuring actual wage restrictions.

Unemployment risks of the low-qualified furthermore depend on the innovative performance of the economy. The more innovative the economy is, the smaller the unemployment risk is. Although the importance of unskilled labour decreases due to economic progress, employment opportunities for low-skilled are positively affected by the level of innovativeness. This result can be attributed to the fact that an economy with greater economic progress is more competitive in general and thus results in higher labour demand for all kinds work.

Figure 3 demonstrates exemplary the effect of EPL on low-skilled unemployment for a mean innovative economy controlling for influences due to hiring rules and wage restrictions. It clearly shows the increase of unemployment due to the strictness of EPL. The likelihood of being unemployed is higher, the more rigid firing rules are. This impact is affected by the strictness of hiring rules and wage restrictions. Unemployment risks decrease the more regulated temporary employment and wage negotiations are. This outcome is produced by the negative interaction effect between firing and hiring rules. As we can see, it is not a linear relationship. Mean hiring and wage regulations reduce the risk of unemployment only slightly in comparison to the minimum observable regulations. Strong restrictions on temporary employment and wages weaken the influence of rigid EPL considerably.

Fig. 3: Low-Skilled Unemployment



Source: EU-SILC 2007, mean innovative performance; reference group at the individual level: women, aged 30-49 years, born in the country of residence.

To what extent EPL influences the duration and frequency of unemployment periods can hardly be answered with the cross-section data of the EU-SILC survey. Bivariate regressions do not show any significant impact between EPL and the unemployment risks of low- and highly-skilled individuals. Based on theoretical considerations, however, it is expected that strict EPL mutates to an employment barrier and thus contributes to the consolidation of unemployment. In order to state reliable evidence about unemployment persistence and incidence, it is necessary to observe the employment histories of the subjects over a longer period of several years. It is expected that the results will show sufficient variance, so that methods of multi-level analysis can be applied.

Another restriction of the study is due to the cross-sectional structure of the data. Strictly speaking, significant coefficients only provide evidence on a relation between EPL and the observed variables. The analysis is not able to verify causal effects. Therefore, longitudinal data is needed.

In summary, firing rules increase unemployment risks of the low-skilled. Instead of protecting employment, strict EPL converts into an employment barrier. Due to the lack of flexibility and high labour costs associated with strict firing rules, low-skilled individuals are forced out of the labour market. This is strengthened by the fact that positive employment effects due to strict EPL are mainly acquired by highly-skilled workers, which results in additional employment disadvantages for the low-skilled. The highly-skilled themselves are able to compensate the negative effects of EPL with an increase in productivity. Other forms of labour market regulation, hiring rules for temporary employment and wage restrictions, do also have an influence on the effects of EPL.

References

- Acemoglu, D. (1997) Training and Innovation in Imperfect Labour Markets, *Review of Economic Studies*, No. 64, pp. 445-464.
- Algan Y./ Cahuc P. (2004) Job protection: the macho hypothesis, IZA DP No. 1192.
- Baker, D./ Glyn, A./ Howell, D. R./ Schmitt, J. (2005) Labour Market Institution and Unemployment: A Critical Assessment of the Cross-Country Evidence, in: David R. Howell (ed.) *Fighting Unemployment: The limits of Free Market Orthodoxy*, Oxford: Oxford University Press, pp: 72 -118.
- Belot, M./Boone, J./ Ours, J. van (2002) Welfare effects of employment protection. CentER Discussion paper, No. 2002-48.
- Bertola, G./ Boeri, T./Cazes S. (1999) Employment protection and labour market adjustment in OECD countries: Evolving institutions and variable enforcement. *Employment and Training Papers* No. 48.
- Bertola, G. (2004) A Pure Theory of Job Security and Labour Income Risk, *Review of Economic Studies*, Vol. 71, pp. 43-61.
- Blau, P. M. (1964) *Exchange and Power in Social Life*, New York.
- Boeri, T./ Nicoletti, G./ Scarpetta S. (2000) Regulation and Labour Market Performance, CEPR Discussion Paper 2420.
- Borjas, G. J. (2000) *Labor Economics*. New York: McGraw Hill.
- Davis, D. R. / Reeve, T. A. (1997) Human Capital, Unemployment and Relative Wages In a Global Economy, in: Harvard Institute of Economic Research, DP No. 1804
- Enste, D. H. / Hardege, S. (2006) *IW-Regulierungsindex. Methodik, Analysen und Ergebnisse eines internationalen Vergleichs*, DIV: Köln
- Esping-Andersen, G. (2000): Who is harmed by Labour Market Regulations? Quantitative evidence. In: *Why deregulate Labour Markets*.
- European Commission (2007a) *Developing Anti-Discrimination Law in Europe. The 25 EU Member States Compared*.
- European Commission (2007b) *European Innovation Scoreboard 2007. Comparative Analysis of Innovation Performance*, PRO INNO Europe paper, No. 6.

EU-SILC (2010) Description of data set.

Source: http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc
[2010-08-10]

Homans, G. C. (1958) Social Behavior as Exchange, *American Journal of Sociology* 63, pp. 199-209.

Iversen, T./ Cusack, T. R. (2000) The Causes of Welfare State Expansion. Deindustrialization or Globalization? *World Politics* 52, pp. 313-349.

Jones, G. R. (1984) Task Visibility, Free Riding and Shirking: Explaining the Effect of Structure and Technology on Employee Behaviour, in: *The Academy of Management Review*, Vol. 9, No. 4, pp. 684-695

Layte, R./ Levin, H. /Hendrickx, J. /Bison, I.(2002) Unemployment and Cumulative Disadvantage in the Labour Market, in: Duncan Gallie/Serge Paugam (eds.) *Welfare Regimes and the Experience of Unemployment in Europe*.

Lindbeck, A./ Snower, D. J. (1987) Theories of Involuntary Unemployment. Efficiency Wages versus Insiders and Outsiders. *European Economic Review* 31, pp. 407-416.

Nolte, A. (2001) *Institutionenökonomische Analyse von Kündigungsschutzregelungen. Ein Beitrag zur Reform des Arbeitsrechts*. DUV: Wiesbaden.

OECD (1999) *Employment Outlook*. OECD: Paris, pp. 47-129.

OECD (2004) *Employment Outlook*. OECD: Paris, pp. 62-123.

OECD (2006), *OECD Jobs Strategy: Lessons from a decade's experience*. Background report No.1 – Reassessing the Role of Policies and Institutions for Labour market performance: a consolidated analysis.

Raudenbush, S. W. (2002) *Hierarchical Linear Models. Applications and Data Analysis Methods*. Oaks: Sage

Scarpetta, S. (1996) Assessing the role of labour market policies and institutional setting on unemployment: a cross-country study, *OECD Economic Studies*, No 26, 1996/1

UNESCO (2010) *International Standard Classification of Education - 1997 version*

Source: http://www.uis.unesco.org/ev.php?ID=3813_201&ID2=DO_TOPIC
[2010-08-10]

Venn, D. (2009) Legislation, collective bargaining and enforcement. Updating the OECD employment protection indicators. OECD Social, Employment and Migration Working Papers, No. 89.

Visser, J. (2009) The ICTWSS Database: Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 countries between 1960 and 2007, Amsterdam Institute for Advanced Labour Studies AIAS, Version 2.

Walwei, U. (1996) Flexibilisierung und Regulierung des Beschäftigungssystems: Optionen und Effekte, MittAB 2/96.

Walwei, U. (2002) Ökonomische Analyse arbeitsrechtlicher Regelungen. In: Gerhard Kleinhenz (ed.) IAB-Kompendium Arbeitsmarkt- und Berufsforschung. Beiträge zur Arbeitsmarkt und Berufsforschung, BeitrAB 250, pp 95-106.

Zientara, P. (2006) Employment Protection Legislation and the Growth of the Service Sector in the European Union. Economic Affairs. Pp. 45-52.

APPENDIX

Tab. A

Country	unemployment persistence	unemployment incidence	unemployment rate	unemployment persistence	unemployment incidence	unemployment rate
AT	7,36	1,10	12,09	6,20	1,11	2,92
BE	10,12	1,04	21,76	7,73	1,10	4,17
CZ	9,41	1,06	24,27	6,44	1,00	1,85
DE	10,03	1,04	22,34	8,63	1,06	6,45
DK	8,57	1,00	6,32	8,80	1,00	2,36
EE	7,29	1,06	13,80	5,74	1,07	1,28
ES	7,85	1,15	15,25	6,97	1,15	5,99
FR	9,14	1,06	16,17	7,25	1,04	5,23
IE	9,06	1,05	13,86	5,92	1,10	3,31
IT	9,60	1,09	12,88	8,49	1,04	7,12
LU	6,98	1,05	9,52	6,22	1,14	3,86
NL	6,11	1,28	3,28	4,61	1,27	1,08
PL	9,37	1,12	28,08	6,72	1,07	4,78
PT	8,82	1,08	10,81	6,98	1,03	6,51
SI	7,80	1,05	22,80	5,50	1,04	5,69
SK	10,66	1,01	39,83	6,70	1,03	3,16
UK	7,75	1,14	7,10	5,69	1,28	1,26
Mean	8,58	1,08	16,48	6,74	1,09	3,94

Source: EU-SILC 2007; unemployment persistence = duration of unemployment within one unemployment period in month; unemployment incidence = number of unemployment periods within the reference year; Finland, Greece, Norway, Sweden and Hungary do not provide individual information on the monthly economic activity status.

Tab. B.1: Multi-level regression results for low-skilled individuals

	ISCED 0-2					
	M0		M1		M2	
	Logit Link	Odds ratio	Logit Link	Odds ratio	Logit Link	Odds ratio
Intercept	-1.697384 ***	0.183162	-1.282558 ***	0.277327	-1.717456 ***	0.179522
<i>LEVEL 2</i>						
Firing rules			-0.045241	0.955767	0.498436 *	1.646144
Hiring rules					0.190950	1.210400
Wage restrictions					0.219319 **	1.245228
Firing*Hiring					-0.396398 **	0.672739
Firing*Wage					0.039089	1.039863
Innovation			-0.224426 **	0.798974	-0.235893 ***	0.78986
<i>LEVEL 1</i>						
AGECLASS 15-29			0.769391 ***	2.158452	0.773572 ***	2.167495
AGECLASS 50-65			0.019272	1.019459	0.01910	1.019286
<i>Ref: AGECLASS 30-49</i>						
Birth: EU			0.049841	1.051104	0.056112 ***	1.057716
Birth: Other country			0.281979 *	1.325751	0.283798	1.328165
<i>Ref: country of residence</i>						
Gender: Male (<i>Ref: Female</i>)			-0.376836 ***	0.686029	-0.378121 *	0.685148
<i>Varianzkomponenten</i>						
Level 2 units	0.47534		0.43341		0.45647	
degrees of freedom	21		19		15	
Level 1 units	47024		47024		47024	
Level 2 units	22		22		22	

Source: EU-SILC, population-average model.

Tab. B.2: Multi-level regression results for highly-skilled individuals

	ISCED5-6					
	M3		M4		M5	
	Logit Link	Odds ratio	Logit Link	Odds ratio	Logit Link	Odds ratio
Intercept	-3.218867 ***	0.040000	-3.731926 ***	0.023947	-4.371409 ***	0.012633
<i>LEVEL 2</i>						
Firing rules			0.371939 *	1.450544	0.465942	1.593514
Hiring rules					0.335198 **	1.398217
Wage restrictions					0.252877 **	1.287725
Firing*Hiring					-0.185218	0.830923
Firing*Wage					0.055813	1.057400
Innovation			-0.089920	0.914004	-0.085322	0.918216
<i>LEVEL 1</i>						
AGECLASS 15-29			1.134327 ***	3.109079	1.132959 ***	3.104831
AGECLASS 50-65			0.221001	1.247325	0.220992	1.247314
<i>Ref: AGECLASS 30-49</i>						
Birth: EU			0.349587 ***	1.418481	0.347757 ***	1.41588
Birth: Other country			1.088290 ***	2.969193	1.089152 ***	2.971753
<i>Ref: country of residence</i>						
Gender: Male (<i>Ref: Female</i>)			-0.285048 ***	0.751978	-0.284760 ***	0.752195
<i>Varianzkomponenten</i>						
Level 2 units	0.41358		0.39732		0.41000	
degrees of freedom	21		19		15	
Level 1 units	59220		59220		59220	
Level 2 units	22		22		22	

Source: EU-SILC, population-average model.