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"Sustainability and transformation in European Social Policy"

<u>WORK IN PROGRESS</u>

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Improving Flexibility:

Consequences on Unemployment Inequalities between Skill groups

Abstract

One of the main strategies of the new welfare state is the flexibilisation of labour market institutions. Particularly, the use of temporary employment contracts has been highly simplified within the last decade. The question that is to be answered within this paper is to what extent labour market deregulation helps to reduce existing inequalities in the unemployment risks between skill groups. The relation between labour market institutions and unemployment risks are considered to differ due to the skill level acquired as a consequence of differences in bargaining power. In order to test this assumption, I investigate the impact of changes in labour market institutions on the unemployment rates of different skill-groups in 13 European countries for the years 1996-2008. Thereby, I also control for the influence of technological progress which is generally considered to weaken labour market opportunities of the low-skilled. The results demonstrate that the deregulation of labour market institutions, particularly the flexibilisation of employment protection legislation, reduces differences in unemployment risks. However, the technological progress that has taken place in the last years does not lead to an intensification of unemployment inequalities.

1 Introduction

The employment opportunities of European low-skilled workers are rather low. Their unemployment rates are often far above the rates of the medium or high-skilled workforce. In 2008, for example, the EU-27 average was 11.6 percent for the low-skilled, persons with upper secondary education showed an unemployment rate of 6.5 percent and those with tertiary education of 3.8 per cent (Eurostat). This development can be traced back mainly to changes in consumer demand. Economic activity has shifted from the primary (agriculture) and secondary (industry) to the tertiary sector (services). New branches have been opened up, especially in the field of information and communication technology. Trade has expanded over national borders (Bertola 2006; Baker et al. 2005; Zimmermann et al. 1999). With the changes in consumer

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demand, also the requirements concerning the production processes have altered. Achieved knowledge has become obsolete and new skills are needed to fulfill the requirements in the service sector and new established branches (Iversen/Cusack 2000).

While the better skilled managed it more easily to adapt to changing conditions, the low-skilled appear to be the loser of technological progress. Problems have been further exacerbated by the existence of generous welfare states. High union wages and unemployment benefits as well as rigid employment protection laws promoted the dualization of the labour markets by strengthening the bargaining power of insiders and mutating into employment barriers for the low-skilled. In this context, the insider-outsider theory by Lindbeck and Snower (1987, 1989) makes an important contribution to the understanding of existing labour market inequalities.

Since the 1990s, however, a variety of deregulatory measures can be observed on European labour markets, which might be incentive for employers to recruit low-skilled workers. Especially for employment protections laws, there was a strong deregulation trend within the last years. The use of temporary employment, fixed-term employment or temporary work agency employment, has been facilitated by changes in legislation.

The question is, therefore, to what extent the deregulation of labour markets is able to counteract inequalities in unemployment risks between skill groups resulting from growing technological progress. So far, empirical analyses almost only concentrated on the impact between labour market institutions and unemployment rates in general (Nickel 1997; Elmeskov 1998, Belot/van Ours 2002, Nickell et al. 2001; Blanchard/Wolfers 2000; Bertola et al. 2001; Baker et al. 2005). Oesch (2010) provides evidence on the influence of labour market institutions on the low-skilled unemployment rate. However, at least to my knowledge, no study focuses on the outcomes for different skill groups. Therefore, the paper contributes to the ongoing deregulation debate by filling a research gap and providing information about the distribution of unemployment risks among workers.

The study focuses on two different inequality measures, capturing both the absolute and relative differences between unemployment rates. The sample is based on macro data of 13 European countries and captures the years 1996 to 2008. In the

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next section, the theoretical considerations are introduced based on the assumptions of the insider-outsider theory. Section 3 provides information about the data. The next section gives an overview on the development of unemployment inequalities. In section 6, the results of the regression analyses are presented and chapter 6 concludes with a discussion of the outcomes.

2 Theoretical considerations

The insider-outsider theory by Lindbeck and Snower (1987, 1989) explains the existence of involuntary unemployment and detects differences in unemployment risks for labour market actors. According to the main assumption of the theory, inequalities can be ascribed to the greater bargaining power of insiders, who are the job owners, in comparison to the outsiders, those seeking for regular employment. It can be not efficient for the employer to replace insiders despite an aggressive wage competition through outsiders. The bargaining power of the insiders results from the labour turnover costs that have to be paid by the employer in the case of changes in personnel and have to be taken into account in the hiring and firing decisions. These costs provide insiders with a certain room to negotiate. Lindbeck and Snower differentiate three aspects determining the size of labour turnover costs (1987):

a) Hiring, training and firing activities: Hiring of new personal causes advertising, screening and negotiation costs. Employees also have to be trained, when entering a new company[1]. Firing costs resulting from the dismissal of an insider, i.e. through severance payments and procedural inconveniences, also lead to an increase of turnover costs.

b) Cooperation and harassment activities: Insiders have the possibility to protect their jobs against outsiders due to strategic behavior. Insiders can mutually

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[1] Only after training expenses and transaction costs have been amortized entrants get bargaining power and turn into insiders.

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cooperate in the production process, while refusing to cooperate with new entrants who work at lower wages. Thereby, they create an "insider-entrant productivity differential" (Lindbeck/Snower 1987: 5). Another strategy is the poor treatment of novices in an otherwise friendly work environment. The psychological costs arising from this harassment raise reservation wages of outsiders, so that the negotiating range of insiders increases further.

c) Effort response to labour turnover: High labour turnover rates decrease job-security and thereby, the likelihood to be rewarded for current effort in the future. Insiders with secure jobs, in contrast, are more willing to cooperate in the production process. Therefore, it is rationale for the employer to reduce the number of fluctuations.

While insiders profit from more stable employment relationships and lower unemployment risk, the outsiders are confronted with restrictive employment barriers, often resulting in persistent unemployment periods. This mechanism is reinforced by the depreciation of human capital during unemployment by forgetting and unlearning previous knowledge, but also by the devaluation of skills due to technological progress.

The allocation to either the group of insiders or outsiders is not random, but depends on individual characteristics. Young people automatically become outsiders after leaving the education system and entering the labour market. The same applies to women who want to take up again employment after having given birth to a child. Also the level of qualification determines, whether individuals are more likely to be an insider or outsider. Principally, simple tasks are considered to be more price elastic (Davis/Reeve 1997). This is because low-skilled workers are easier to replace. Simple tasks can be performed by many people, in principal even by the highly-skilled (Oesch 2010). The low-skilled, therefore, are exposed to greater competition, so that search costs are only minor for the employer. Moreover, training expenses are low compared to a position with complex tasks, since the required qualifications can be acquired quickly. In comparison to higher-skilled workers, labour turnover costs for the low-skilled are rather small. The demand for unskilled labour, therefore, reacts more sensitive to fluctuations in consumer demand, which, in turn, increases the risk of job loss significantly for the low-skilled.

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These differences were reinforced by structural and technological change. The de-industrialization process taking place since the beginning of the 70s, which is mainly characterized by an employment shift from the primary and secondary to the tertiary sector, is considered to strengthen differences in the bargaining power between skill-groups. In this context, changes in consumer demand play an important role (Schmid 2001). In part, however, the decline of employment in the industrial sector can be lead back to an increase in factor productivity: due to the use of technologies less human labour is necessary to achieve a given output. This refers primarily to "routine" labour that can be easily rationalized (Goos et al. 2009). In addition, for high-income countries, it is efficient to outsource labour-intensive manufacturing production towards middle- and low-income countries (Debande 2006).

Although, there are new jobs created by technological progress, especially in the fields of information and communication technology, due to increasing innovation activities of firms, simple and standardized operations as they are normally exercised by the low-skilled, are forced out of the market. The transition from an industrial to an information or knowledge society is associated with an increased demand for human capital (Zimmermann et al. 1999). Acquired knowledge in the industrial sector, in contrast, is partly subject of a more or less complete validation and cannot be transfered to the service sector.

Based on this development, the concept of skill-biased technological change evolved, which claims that, particularly due to the diffusion of information technology, high-skilled labour is favoured above low-skilled (Oesch, 2010). All in all, inequalities in unemployment risks are considered to be stronger, the more advanced the country's economy is.

In the following, it will be investigated to what extent the deregulation process that has taken place in many countries within the last years influences labour market inequalities. A prominent role in this context is played by the flexibilisation of employment protection legislation (EPL). Generally, EPL can be described "as restrictions placed on the ability of the employer to utilize labor" (Addison/Teixeira 2001, p.2), or according to the OECD, as "rules governing the hiring and firing process" (OECD 2004, p.64). From an economical perspective, the strictness of EPL is determined by the costs related to the dismissal of an employee. One can distinguish between costs directly associated with a lay-off, quantifiable and already known before

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the employment relation starts, e.g. severance payments; and indirect costs arising from procedural inconveniences and difficulties to enforce a dismissal. There is, furthermore, a distinction between employment protection laws for regular and temporary employment. The latter includes both fixed-term contracts and the employment over a temporary work agency. Unlike EPL for regular employment, regulation on temporary employment does not cover rules governing severance pay and notice periods, since the end of the labour contract is already determined in advance. These rules mainly deal with the duration and number of contracts that can be made with one employer at the maximum and with requirements on substantive grounds in order to make use of fixed-term employment. In the last decades, especially the relaxation of rules restricting the use of temporary employment has taken pride of place within scientific debates (for an overview see e.g. Skedinger 2010 or Addison/Teixeira 2001).

Following the insider-outsider theory, strict employment protection regulation is considered to strengthen the bargaining power of insiders. Since EPL directly affects labour turnover costs, the negotiating range grows in the way EPL increases. It also has an indirect effect by influencing the willingness to cooperate. The perception of job security is facilitated for employees if employment protection is fixed by legislation. Therefore, it is expected that the effect of effort response toward labour turnover is amplified by strict EPL. Since insiders are workers, who are already employed at the company for a longer duration, one may expect that their bargaining power depend only on rules concerning regular employment but not on temporary employment. Therefore, strict EPL for regular employment is considered to strengthen labour market inequalities. The influence of restrictions on temporary employment is, however, questionable. Insiders are not affected by these rules. Flexible legislation might facilitate the entry into labour markets for outsiders, however, due to lower levels of employment protection, they also have a higher risk to be dismissed. To what extent unemployment risks of the low-skilled are influenced through regulations on temporary employment remains unclear. Both effects could offset each other. Crucial concerning the effects on existing inequalities is the question, whether the measure of temporary employment is also applied to the better skilled. In this case, the bargaining power of better skilled individuals would decrease due to a flexibilisation of temporary employment, just because the skill ratio between insiders and outsiders insiders would be reduced. On average, differences in unemployment risks would decrease. Basically,

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one may assume that better skilled individuals are covered considerably less by temporary employment, however, it might be rationale for the employer, although generally interested in stable employment relationships, to employ highly-skilled (re-) entrants on a fixed term basis as a kind of extended trial period. The low probability to be employed on a temporary basis results from the general diminished unemployment risks of the better skilled.

Wage setting institutions strengthen unemployment inequalities if bargained wages do not reflect productivity differentials appropriately (Esping-Anderson 2000). In the context of the insider-outsider problematic, this means if unions introduce minimum wages that are above the wages employers would accept in order to employ outsiders, they automatically raise the unemployment risks for them. Because trade unions are interest groups, they primarily aim to satisfy the interest of their members (Accornero 2005) and do not account for external effects on non members. Therefore, the stabilization of employment barriers for outsiders is considered to be strengthened by strong wage setting institutions, while flexible wage systems facilitate labour market entries. However, since the highly-skilled mainly gain wages that are above the union rate, especially the differences between low- and middle-skilled individuals should be affected.

The bargaining power of insider is also determined by existing outside-options, such as the level of unemployment benefits (Lindbeck/Snower 1987, 1989).

The better the outside options are, the higher the reservation wages of the outsiders. In other words, if transfer payments are generous, outsiders are less willing to accept wage cuts, which in turn increases the bargaining power of insiders. Due to the fact that outsiders stay longer in unemployment, generous compensation payments promote the depreciation of human capital. Thus, the higher the unemployment benefits, the greater the expected disparities in the unemployment risks are. If the outsider options are less attractive, outsiders are more willing to accept wage cuts. The increase in unemployment opportunities is then bought by lower wages.

Active labour market policies, in contrast, help to improve the bargaining power of outsiders. Active labour market policies aim at enhancing the productivity of outsiders by a) offering information on vacancies, b) training schemes in order to improve vocational skills and employability and c) providing employment subsidies in

order to facilitate work experience and to prevent the amortization of human capital (Calmfors 1994). Since productivity differentials between in- and outsiders can be reduced by generous active labour market policies, inequalities in unemployment risks are expected to decrease the more governments spend on such programs.

3 Data

The data covers 13 European countries[2] from 1996 till 2008. These countries are the Czech Republik, Germany, Spain, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Sweden and the United Kingdom. The panel is strongly balanced.

As indicator for unemployment inequalities two different measures are introduced. The first is a measure that captures the relative differences in unemployment risks between skill groups ($\text{Uempl.Rate}_{\text{low-skilled}}$ / $\text{Unempl.Rate}_{\text{high-skilled}}$) and the second provides information on the absolute differences in the unemployment risks ($\text{Uempl.Rate}_{\text{low-skilled}}$ - $\text{Unempl.Rate}_{\text{high-skilled}}$). Inequalities between the low-and highly-skilled as well between the low- and middle and the middle-and highly-skilled are taken into account. Individuals are grouped according to the ISCED-97 scheme, which categorizes skills into seven classes according to their degree of education and vocational training (UNESCO 2010). Unemployment rates for the skill groups are provided by EUROSTAT, where pre-primary, primary and lower secondary education are grouped into one category ("Low-skilled"), upper secondary and post-secondary education into a second ("Middle-skilled") and first and second stage of tertiary education into a third category ("Highly-skilled). Since the effects of economical and institutional change on yearly unemployment rates are considered to be delayed, unemployment rates used in the estimations always correspond to the year after the change has taken place.

Economical developments are captured by three variables. In order to account for structural change, it is controlled for the size of the service sector measured as

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[2] Countries without any or enough variation in employment protection have been excluded on the basis of the Fisher's test.

proportion of employees in the service sector. Technological progress in terms of the innovativeness of a country is measured as percentage of individuals employed in medium-high and high-tech manufacturing as well in high-tech services[3]. The skill-ratio, the relation of low- to highly-skilled individuals, is an indicator of the supply of advanced skills and illustrates the level of competition within the skill groups. It also provides information on the expansion of education that is related to economical development.

The strictness of employment protection legislation is measured as dismissal rules for regular employment and regulation on fixed term and temporary work agency employment according to the OECD. The former captures information on notice and severance pay, procedural inconvenices and the difficulty of a dismissal. The latter includes data on the maximum number and maximum duration of contracts applicable at one company, as well general restrictions on the use of temporary employment (for more information on the indizes please see OECD 2004 or Venn 2009). Both indicators are valued on a scale from 0 to 6 with higher numbers illustrating stricter regulation. An increase in employment protection legislation is considered to be related to an increase in existing inequalities between skill groups.

Wage setting institutions are captured by three different variables in order to measure union strength. Union density provides information on the share of employees being a union member in relation to the total workforce. However, union density does not say much about the number of employees covered by collective agreement. In some countries, the membership rates are rather low, while the main part of labour contracts is, nevertheless, covered by bargained wages. However, one may nevertheless assume that higher levels of union density are associated with more bargaining power of insiders. Another indicator is the degree of centralization, which allows statements about how far salaries are negotiated at the company, industry or the national level. One may assume that insider interests are best covered by union wages that have been bargained at the industry level, while wages that are bargained at the national level are expected to take outsider

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[3] The use of these variables as a measure for technological progress is based on the European Innovation Scoreboard of the European Community (2007) in order to measure innovation performance of a country. However, the innovation index originally includes numerous variables, so that is questionable whether these two indicators alone are sufficient to display the innovativeness of a country correctly. However, due to lacks of data, it was not possible to replicate the index for all 13 years.

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concerns into account, too. The intensity of co-ordination shows the extent to which wage bargaining is coordinated between different labour market actors (Enste / Hardegen 2006). The more coordination takes place, the more economic aspects can be considered in the wage bargaining process. Due to negative long-run effects of high and persistent unemployment rates, highly coordinated bargaining wages are assumed to decrease inequalities in unemployment risks between skill groups. Both indicators are measured on a scale from 0 to 5 with higher number expressing a higher degree of coordination or centralization respectively.

Unemployment benefits are measured as the average of the gross unemployment benefit replacement rates for two earnings levels, three family situations and three durations of unemployment. Since generous benefits strengthen the outside options, they are associated with higher levels of unemployment inequalities.

Active labour market policies are measured by an index capturing expenses on training, job rotation and job sharing, employment incentives, supported employment and rehabilitation, direct job creation and start-up incentives (codes 2-7) as percentage of GDP. Higher expenses are considered to improve the bargaining power of outsider and thus, to weaken their labour market risks in relation to higher qualified individuals.

As control variables, in order to account for the influence of business cycles, the output gap, the annual GDP growth and the long-term interest rate are considered in the models. Table A (annex) shows the summary statistics for all of the 19 variables used in the regression analyses.

4 Descriptive Results

Concerning, the development of unemployment inequalities, there is no clear trend observable within the last years. On average, unemployment risks of the low-skilled are 3.6 times higher compared to the highly-skilled and 1.75 times higher compared to the middle-skilled. The middle-skilled have a two times higher unemployment risk than the highly-skilled.

Figure 1: Unemployment Rate Ratios
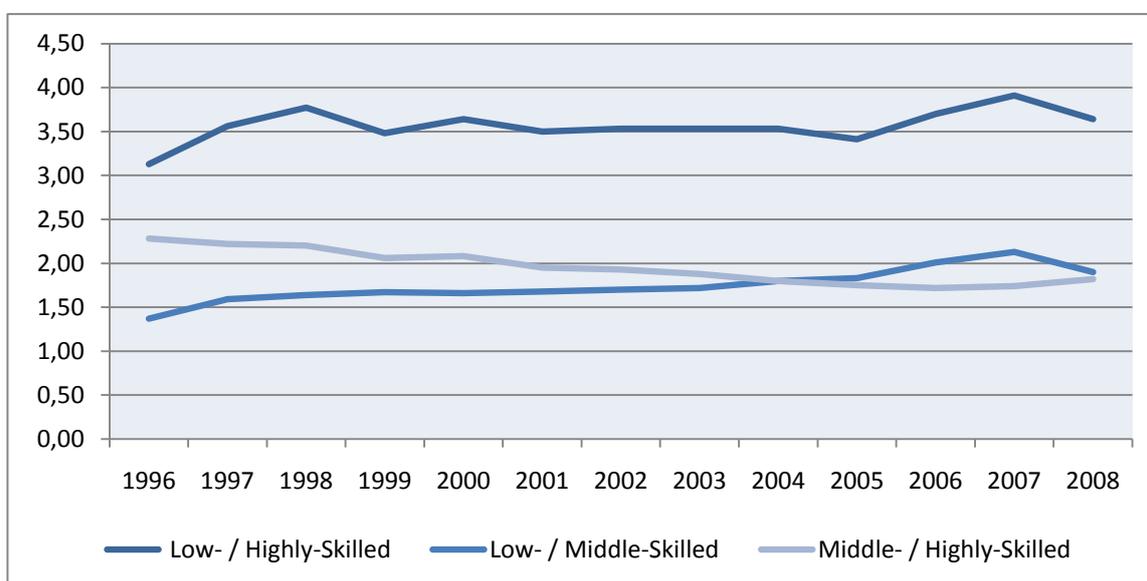
Source: own calculations

The unemployment rate ratio between low- and highly-skilled individuals is on average rather constant with phases of increasing and decreasing unemployment inequalities (Figure 1). Concerning the risk ratio of the low- and middle-skilled we can see, except for the last year, a clear trend of increasing inequalities between both groups. For the middle-and highly-skilled, there is an opposite trend. In 2004 the risk ratio of low-and middle-skilled exceeds first the risk ratio of the middle-and highly-skilled.

The absolute difference between the lowest- and highest-skilled individuals is 7.9 percentage points. The rates of the low- and middle-skilled differ by on average 4.3 percentage points and between the middle-and highly-skilled by 3.5 percentage points.

Figure 2: Differences in Unemployment Rates
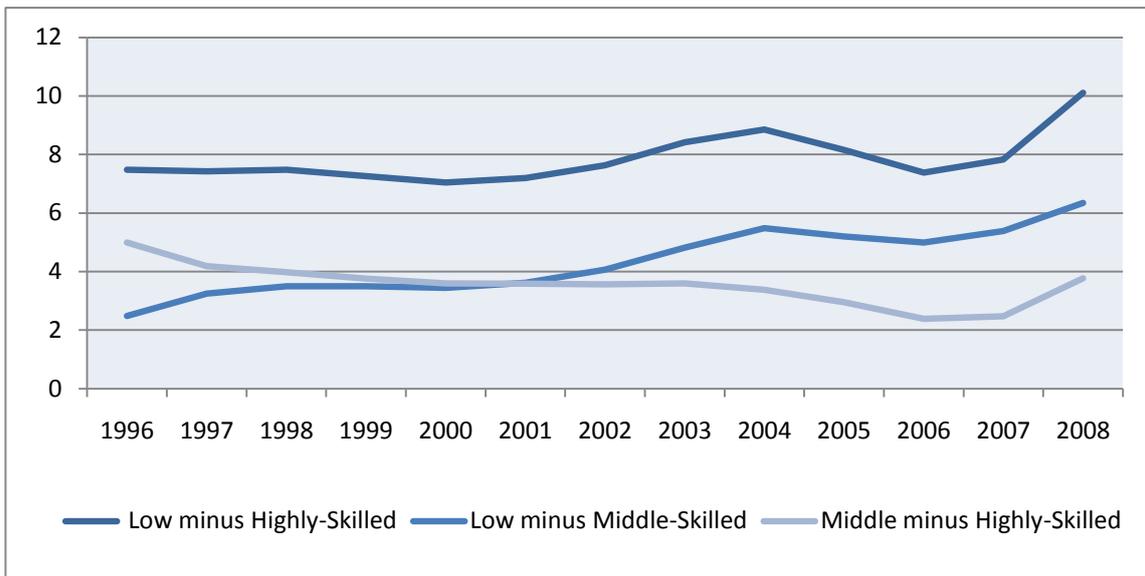
Source: own calculations

Graph 2 illustrates the development of unemployment differences between two groups.

The results show a similar picture as in graph 1 with the difference that the lines intersect each other already three years earlier and that there is an increase in the unemployment differences within all three indicators.

In some countries, the middle-skilled individuals even show higher unemployment rates than the low-skilled. This is true for Greece, and at least in some years, also for Portugal and Spain. The highly-skilled, in contrast, always face lower unemployment risks compared to the other skill groups.

5 Regression Results

The regression results in table 1 show the effects of labour market institutions and technological development. Indeed, there is some evidence that the deregulation of labour markets reduce labour market inequalities.

Model 1 to 3 demonstrate the results for the unemployment ratios, while models 4 to 6 show the effects on absolute unemployment differences. All macro variables are centered around their overall mean. All regression analyses include year-dummies.

First, the outcomes on the unemployment ratio between the low- and highly-skilled are described (model 1). The regulation on regular employment has a positive and significant effect on the ratio. An increase in the restriction on regular employment by one unit raises the unemployment risk ratio by 2.14. Union density is also positively related to the risk ratio, as well as the coordination of wage bargaining. While the former meets the expectations, the latter is counterintuitive. Regulation on temporary employment, the degree of centralization, unemployment benefits and active labour markets are, despite the theoretical considerations, not related to the risk ratio of the low- and highly-skilled. From the variables measuring technological development only the skill-ratio shows a positive and significant impact. The higher, the share of the highly-skilled compared to the low-skilled is, the bigger the existing inequalities in unemployment risks are. Thus, the skill-ratio rather does not seem to measure economic competitiveness, but seems to be an indicator for the innovation performance in the economy. The requirements of the economy, then, seem to be reflected in the qualification structure of the workforce. Employment in the service sector and in high-technology sectors does not have a significant effect on the ratio.

The results on the ratio of the low-and middle (model 2) and the middle- and highly-skilled (3) allow the disaggregation of the effects. Regulation on regular

employment only has a positive effect on the middle-/highly-skilled ratio, while the effect of the union density is only significant in order to explain differences between the low- and middle-skilled. Coordination is also only positively correlated to the middle-/highly-skilled ratio, but negative and insignificant to the low-/middle-skilled ratio. This result explains the rather counterintuitive relation between coordination and the overall result on the low-/highly-skilled ratio, which we see now, can be reduced to the middle- and highly-skilled only: The higher the level of coordination, the more long-term economical interests are captured within the wage bargaining procedure. In order to avoid high and persistent national unemployment rates, the wage structure has to be compressed, so that outsiders get a chance to (re)enter the labour markets. Since the wages of the highly-skilled workforce are mostly bargained at the individual level, low union wages promotes rent-seeking behavior. In the case that middle- and highly-skilled individuals compete for the same jobs, the highly-skilled then can exploit their bargaining power and price the middle-skilled out.

Although the overall effect of regulation on temporary employment is not significant, the regression results show a meaningful and positive effect for the low-/middle-skilled ratio meaning that the low- and middle-skilled individuals are differently affected by the employers possibilities to use temporary contracts. The flexibilisation of temporary employment, thus, leads to the weakening of the bargaining power in particular for low-skilled outsiders. Unemployment benefits show contrasting results. An increase in the generosity of replacement rates increases the low-/middle-skilled risk ratio, but lowers the differences in unemployment risks between the middle- and highly-skilled. While the former outcome meets the expectations, the latter is not clear. Probably, matching processes of the middle-skilled are improved by high benefits, so that their bargaining power is strengthened as well. Since the low-skilled are easy to substitute, finding an appropriate matching partner is generally less difficult.

The skill ratio is only related to the low-/middle-skilled but not to the middle/highly-skilled ratio. This result might indicate, that the low-skilled are displaced from the labour market the more qualified the general skill structure is, while the middle-skilled were able to adapt to technological changes. This assumption is even strengthened by the effects of the employment share in high-technology sectors. For the low-/middle-skilled ratio, the coefficient is significant and positive, for the middle-/highly-skilled ratio it is significant and negative, while the overall effect is negative but

not significant. The expansion of high technology sectors, thus, has in particular improved the labour market chances of the middle-skilled.

Table 1: Inequalities in Unemployment across Skill groups

	(1)	(2)	(3)	(4)	(5)	(6)
	Ratio: Low-/Highly-skilled	Ratio: Low-/Middle-skilled	Ratio: Middle-/Highly-skilled	Difference: Low-/Highly-skilled	Difference: Low-/Middle-skilled	Difference: Middle-/Highly-skilled
Labour Market Institutions						
Regulation on Temporary Employment	-0.049	0.161***	-0.095	0.864**	0.469	0.395**
	(0.176)	(0.052)	(0.086)	(0.367)	(0.377)	(0.154)
Regulation on Regular Employment	2.137***	0.316	0.774**	6.066***	4.095**	1.971**
	(0.563)	(0.035)	(0.334)	(1.797)	(1.419)	(0.743)
Union density	0.110**	0.058*	0.003	0.082	0.205	-0.122
	(0.005)	(0.032)	(0.030)	(0.287)	(0.238)	(0.130)
Centralization	-0.105	-0.024	-0.013	-0.553**	-0.453***	-0.100
	(0.085)	(0.026)	(0.046)	(0.217)	(0.111)	(0.187)
Coordination	0.437**	-0.053	0.410***	1.047	0.167	0.880**
	(0.159)	(0.060)	(0.107)	(0.661)	(0.609)	(0.292)
Unemployment Benefits	-0.025	0.014*	-0.025***	0.102***	0.111***	-0.009
	(0.020)	(0.007)	(0.008)	(0.027)	(0.202)	(0.018)
ALMP	-0.391	-0.242	0.097	1.890*	0.430	1.460**
	(0.313)	(0.155)	(0.152)	(1.006)	(0.916)	(0.567)
Technological development						
Employment in service sector	-0.049	-0.041	-0.038	-0.158	-0.150	-0.009
	(0.060)	(0.030)	(0.038)	(0.344)	(0.265)	(0.132)
Skill-ratio	0.0436**	0.037**	0.001	0.049	0.017	0.032
	(0.014)	(0.011)	(0.009)	(0.111)	(0.094)	(0.030)
Employment in high-technology sector	-0.201	0.130**	-0.205***	-0.325	0.153	-0.478**
	(0.129)	(0.050)	(0.064)	(0.570)	(0.453)	(0.210)
Control variables						
Long-term interest rate	-0.226	-0.068	0.029	0.946*	0.047	0.900**
	(0.203)	(0.049)	(0.104)	(0.500)	(0.363)	(0.377)
Output Gap	-0.121***	0.007	-0.057**	-0.527*	-0.207	-0.321**
	(0.038)	(0.020)	(0.022)	(0.256)	(0.176)	(0.133)
GDP growth rate	0.097**	0.054**	-0.013	0.187	0.245	-0.058
	(0.044)	(0.020)	(0.020)	(0.262)	(0.190)	(0.123)
n	146	146	146	146	146	146
Countries	13	13	13	13	13	13
R²	0.453	0.655	0.560	0.457	0.457	0.620

Note: All estimations include year dummies. Macro variables are centered around their overall mean. Absolute values of z-statistics in parentheses. Regression models are fixed effect models with country robust standard errors. *** significant at the 1%-level, ** significant at the 5%-level, * significant at the 10%-level

The effects on the absolute differences between unemployment rates (models 4 to 6) are somewhat different. The overall effect on temporary employment is now positive and significant, with a positive and significant effect on the middle-/highly-skilled differences, but not for the differences between the low- and middle-skilled. These

outcomes contradicts the results in models 2 and 3 and indicate that the middle-skilled cannot improve their bargaining power due to an increase in the regulation on the use of temporary work, while the highly-skilled can. Dismissal rules for regular employment now show positive and significant relations within all three models. However, differences between the low- and middle-skilled grow somewhat more due an increase in the strictness of dismissal rules compared to the differences between the middle- and highly-skilled. Union density is not significant anymore. Instead, we can observe, as expected, negative effects for the level of centralization. However, coefficients are only significant in models 4 and 5. The overall effect of bargaining coordination has lost significance. However, similar to model 3, the coordination level is positively correlated to the unemployment differences between middle- and highly-skilled individuals.

Unemployment benefits are now significant and positively related to the differences between the low- and highly-skilled as well between the low- and middle-skilled. In contrast to the expectations, an increase in expenditures for active labour market policies raises the differences in unemployment rates between the low- and highly-skilled. However, as model 6 shows, the effect can be reduced to the highly-skilled that can improve their general bargain power. This result is again unclear. It might be explained by the measure itself, which does not control for the amount of unemployed people within the countries that are supplied by these policies.

From the variables operationalizing technological change, only one coefficient is significant: An increase in the share of employment in high-technology sectors, reduces unemployment differences between the middle- and highly-skilled. There is no evidence that the low-skilled are displaced from the labour market by the technological progress that has taken place since 1996.

6 Resumé

The results provide evidence that the flexibilisation of the labour markets in terms of deregulating institutions is able to reduce existing inequalities in unemployment differences. Thereby, regulations on regular employment seem to play the most important role. But why do the results of the unemployment ratio deviate that much

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from the outcomes on unemployment differences? The answer is simple. Unemployment ratios react more sensitive to changes in unemployment rates, when unemployment for the highly-skilled is generally on a rather low level. In Netherlands, for instance, the low-skilled unemployment rate is, averaged over all years, 6 percent. The unemployment rate of the highly-skilled is 2 percent. Thus, we have an unemployment ratio of 3 or, in other words, the unemployment risk of the low-skilled is three times higher compared to the highly-skilled. If the low-skilled unemployment rate would rise by one percentage point the ratio would change to 3.5, which is an increase of 0.5 units. In Poland, however, the unemployment rate is on average 22 percent for the low-skilled and 5 percent for the highly-skilled, which corresponds to a ratio of 4.4. An increase of unit in the low-skilled unemployment rate would change the ratio only by 0.2 units. Thus, changes in countries with very low unemployment rates for highly-skilled individuals might be overestimated. In the sample, for 6 countries the highly-skilled rate is below 3 percent. These are the Czech Republic, Hungary, Ireland, the Netherlands, Norway and the United Kingdom. The comparison of the two inequality measures shows that these countries are less influenced by changes in regulation on temporary employment, but more by the level of coordination. However, the examination of differences in unemployment rates seems to be more appropriate for research interested in the economic consequences of deregulation and technological progress, in contrast to the estimation of relative risks. Following this assumption, the deregulation of employment protection legislation, unemployment benefits and the level of bargaining centralization would improve employment opportunities of the low-skilled and increase incentives for the employer to hire outsiders. In contrast, the level of technological progress that has taken place within the last years did not affect unemployment inequalities between skill groups. However, one has to take in mind that the improvement of employment chances is probably bought by lower wages and insecure job relations.

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Annex A

Variables	n	Mean	Std. Dev.	Min	Max
Dependent Variables					
Ratio: Low/Highly-Skilled	168	3.57	2.49	1.10	12.48
Ratio: Low/Middle-Skilled	168	1.75	0.75	0.54	5.24
Ratio: Middle/Highly-Skilled	168	1.95	0.78	1.06	5.15
Difference: Low/Highly-Skilled	168	7.87	5.79	0.70	24.70
Difference: Low/Middle-Skilled	168	4.32	4.69	-6.60	19.80
Difference: Middle/Highly-Skilled	168	3.55	2.71	0.10	14.60
Labour Market Institutions					
Regulation on Regular Employment	169	2.44	0.80	0.95	4.33
Regulation on Temporary Employment	169	1.87	1.28	0.25	5.38
Union density	169	32.02	16.72	14.20	82.70
Centralization	169	2.70	0.98	1.00	5.00
Coordination	169	3.12	1.26	1.00	5.00
Unemployment Benefits	157	27.48	12.67	2.97	52.86
Active Labour Market Policies	169	0.53	0.40	0.03	2.20
Technological development					
Employment in service sector	165	62.92	8.31	42.70	79.40
Skill-ratio	165	37.82	16.83	15.80	80.70
Employment in high-technology sector	158	9.45	2.99	3.63	14.70
Control variables					
Output Gap	169	0.33	1.70	-3.50	4.80
GDP growth	169	3.14	2.17	-3.56	11.46
Long-term interest rate	156	5.32	1.65	3.32	14.46

Source: own calculations

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