Skill-Based Inequalities in Marginally Deregulated Labour Markets:

A comparative analysis of the relation between the protection of temporary and permanent employment, and transaction cost drivers of skill-based inequalities in the risk of temporary employment.

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Abstract

It has been argued that deregulating the restrictions regarding the use of temporary employment relative to the protection of permanent employment ("deregulation at the margins") drives employers to award permanent contracts increasingly to the high-skilled, while hiring low-skill employees increasingly on temporary contracts. In this study, two micro-level transaction cost mechanisms underlying this theory are tested, using multi-level models and data from the European Social Survey round 2 and 5. First, the incentive mechanism is tested, which states that employers align the incentives of difficult to monitor employees with operational goals (H1a), and are increasingly likely to do so as marginal deregulation increases (H1b). It is found that deregulation at the margins indeed increases the risk of temporary employment for employees with low discretion in organizing their daily tasks, which is assumed a proxy for low monitoring costs. Second, the buffer mechanism is tested, which states that employers hire employees with high firm-specific human capital on permanent contracts, while buffering these contracts against volatility by hiring low-specificity employees on temporary contracts (H2a). Moreover, employers are expected to be increasingly likely to do so as marginal deregulation increases (H2b). It is found that deregulation at the margins increases the risk of temporary employment for employees in jobs which take a short period to master, which is used as an indicator for the specificity of human capital. However, both mechanisms disappear when the interaction between educational attainment and marginal deregulation is controlled for, contrary to expectation (H3). Tentative explanations are offered as to why the educational mechanism is dominant.

1. Introduction

Ever since Western labour markets departed from the relatively stable system of employment relations associated with the predictability of Fordism, scholars have been concerned with the inequalities that the subsequent move to market mediated employment relations entailed (Barbieri, 2009; Kalleberg, 2011; Rodgers & Rodgers, 1989; Powell, 2001). An important source of inequality has been the increasing availability and utilization of so-called non-standard employment relations. These are employment relations governed by temporary and flexible contracts, and those filed under the heading of self-employment and agency-employment, which generally have negative implications for employees' job security (Cranford, Vosko, & Zuckewich, 2003; Kalleberg, 2011; Rodgers & Rodgers, 1989). Rising inequalities in job security have been discussed under de heading of "insider/outsider" labour markets (Barbieri, 2009; Muffels & Luijkx, 2008; Rueda, 2005), the rise in precarious and low-quality employment (Kalleberg, 2011) and a hypothesized growth of the "precariat" (Standing, 2011). Insiders, on the one hand, are able to obtain high wages, employment security, and jobs that are of decent overall quality. Outsiders, on the other hand, are those who earn low wages, have little security and occupy jobs that can overall be deemed to be of low-quality (Emmeneger, Häusermann, Palier, & Seeleib-Kaiser, 2009; Kalleberg, 2009). Next to experiencing job insecurity, these outsiders, or precarious employees, run increased risks of in-work poverty and poverty in unemployment (Van Lancker, 2012).

Patterns of inequality in job security differ considerably between institutional environments. Where the United States seem to have managed to limit inequality in job security at the expense of wage inequality, European countries seem to have done the opposite, often at the expense of the low skilled (DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006). Within Europe, skill-driven divides between labour-market insiders and outsiders seems especially strong in the Southern European countries, with their policies of "deregulation at the margins" (Barbieri, 2009; Barbieri & Scherer, 2009; Golsch, 2003). The Northern European countries in general and Denmark in particular, on the other hand, seem to have been able to limit the extent of inequality by adopting a system often described as "flexicurity", which drives high employability across the board (Muffels & Luijkx, 2008). Generally, low-skill outsiders in inflexible labour markets are specifically at risk of financial insecurity (Van Lancker, 2012), which is exemplified by the Southern European countries (Muffels & Luijkx, 2008).

This paper aims to assess the institutional characteristics related to skill-based inequalities in the risk of temporary employment. It is expected that larger differences between the protection of permanent and temporary contracts place the low-skilled at an increased risk of temporary

employment (Gebel & Giesecke, 2011). More specifically, transaction costs associated with the monitoring and replacing of employees interact with the relative strength of the institutional protection of temporary contracts (EPLt) *vis á vis* the protection of permanent contracts (EPLp). This interaction increases the risk of temporary employment for easily monitored and replaced employees in low EPLt/high EPLp environments (Polavieja, 2003). Though formulated earlier, these transaction cost mechanisms have generally been tested indirectly, by using a skills variable as a proxy (see for instance: Gebel & Giesecke, 2011). Here, the transaction cost mechanisms are tested directly. Indeed, transaction costs seem to explain the risk of temporary employment, which is acted upon by the relative protection of temporary and regular contracts. However, the interaction with the institutional protection of employment disappears when the interaction with educational attainment is accounted for.

2. Theoretical framework

2.1 Institutions and skill-based inequalities in employees' risk of temporary employment

Many scholars have observed the existence of skill-based inequalities in the risk of temporary employment, which refers to employees employed on a temporary contract, by their *de facto* employer. For Spain, Golsch (2003) shows that highly qualified and highly educated employees are better protected against the risk of temporary employment, which is consistent with Polavieja's (2003) analysis of a segmented Spanish labour market. These findings hold for France (DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006), the Netherlands (De Vries & Wolbers, 2005), Germany (Giesecke & Gross, 2003; Leschke & Keune, 2008), the United Kingdom (Leschke & Keune, 2008) and Europe in general (Maurin & Postel-Vinay, 2005; Wagenaar, Taris, Houtman, Van Den Bossche, Smulders, & Kompier, 2013). Italy, however, seems somewhat of a deviating case. There, the tertiary educated seem most at risk of temporary employment when entering the labour market, while being no surer of a stable contract later on (Barbieri & Scherer, 2009). Moreover, cohort effects on the risk of temporary employment are quite strong in Italy, which holds for Spain as well (Barbieri & Scherer, 2009; Golsch, 2003). Presumably, these findings led Barbieri (2009) to propose that inequality in job-security and wages are mainly skill-driven in the Northern and continental institutional clusters, whereas it is age-driven in the Anglo-Saxon and Mediterranean countries (Barbieri, 2009). Gebel & Giesecke (2011) adopt the notion that institutional differences influence the pattern of inequality, and propose that the country-level difference in the protection of temporary and permanent contracts influences the strength of low skill-level as a risk factor for being employed in a temporary job. Indeed, using educational attainment as a proxy for skill, they find that "decentralization at the

margins", i.e. low protection for temporary employment combined with high protection for permanent employment, is positively related to low-skilled employees' risk of being employed in a temporary job (Gebel & Giesecke, 2011).

A number of explanations have been offered for the advantages highly skilled individuals have over low-skilled peers. Human capital theory, positional good theory and closure theory all predict a stronger position in the labour market for the highly educated (Bol & Werfhorst, 2011), which would allow them to bargain for job security (De Vries & Wolbers, 2005). Moreover, the specific mechanisms by which education leads to labour market outcomes has been shown to interact with the institutional environment: strongly coordinated vocational systems, for instance, add to the strength to the closure mechanism (Bol & Werfhorst, 2011). Moving from educational attainment to the content of skills and jobs, employers expectedly incorporate employees with high firm specific human capital and difficult to monitor jobs into the organizational hierarchy, in order to economize on transaction costs (Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003; Williamson, 1981). Following this strand of literature, Polavieja (2003) proposes that transaction costs lead to the possibility of employee rents, which is especially salient for employees with high specificity of human capital in jobs which are difficult for the employer to monitor. This drives employers to make temporary and permanent contracts part of their incentive structure, with different implications for jobs with different skill contents, which becomes a basis of labour market segmentation. Partly in response to Polavieja, Gebel & Giesecke (2011) propose that the strength of the above mechanism is influenced by the institutional environment and, specifically, the difference between the protection of temporary and permanent contracts. Indeed, in an excellent study, using European Labour Force Data for 15 European countries over the period 1992 – 2007, they find just that.

However, Gebel & Giesecke use educational attainment as their independent variable, which consequently serves as a proxy for asset specificity and monitoring costs. This makes the results ambiguous with regard to the mechanism, as they leave unexplained to what extent the favourable outcomes for highly educated employees in different institutional environments are a result of employers valuing employees' human capital, the positional character of employees' educational attainment, the closing nature of employees' occupation, their asset specificity, or their employers ability to monitor their performance. The present study aims expands on Gebel & Giesecke's 2011 study, by focusing more directly on the transaction cost mechanisms underlying their framework. First, the transaction cost mechanisms are outlined, and for both of these mechanisms separate hypotheses are derived about their relation to temporary employment and their interaction with employment protection legislation. Second, these mechanisms are tested using relevant questions from the European Social Survey, and the round 2 and round 5 rotating module on "Family, work and

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wellbeing". Finally, the results for the two mechanisms are discussed and contrasted to the explanatory power of the educational mechanism.

2.2 Transaction costs mechanisms and EPL differences

Generally, two mechanisms are identified, driving skill-based segmentation by type of contract: the incentive mechanism and the buffer mechanism (Gebel & Giesecke, 2011; Polavieja, 2003) First, the incentive mechanism follows from the transaction-cost proposition that, as tasks become increasingly complex, employers' ability to monitor employees' performance decreases, which drives the former to rely more strongly on appropriate incentive structures to ensure productivity (Goldthorpe, 2000; Williamson, 1981). Though direct monitoring and rudimentary incentive structures are sufficient to safeguard the productivity of employees performing simple tasks, more complex tasks require a more open-ended alignment of the employee's personal goals with those of the employing organization (Emmenegger, 2009). This is done through the incorporation of these employees in the organizational hierarchy through the use of permanent contracts, internal labour markets, and the possibility of promotion (Emmenegger, 2009; Kalleberg, Reynolds, & Marsden, 2003; Osterman, 1987). Moreover, easy to monitor employees can be incentivized by employing them on a temporary contract and promising to offer a temporary contracts if performance is satisfactory (Gebel & Giesecke, 2011; Polavieja, 2003). As a baseline expectation, difficult to monitor employees should consequently have a lower risk of being employed on a temporary contract, compared to easy-to-monitor employees.

Following the outlined mechanism, Gebel & Giesecke (2011) propose that higher differences between the protection of temporary contracts and the protection of permanent increase the strength of the mechanism, as more strongly protected permanent contracts make for stronger incentives. If so, a temporary contract with a possible conversion to a permanent contract is more often used as an incentive in environments with low EPLt and high EPLp. This makes the group to which this incentive is targeted, i.e. easy to monitor employees, more likely to be employed on a temporary contract in these environments (Gebel & Giesecke, 2011). In this vein, for difficult to monitor employees more secure permanent contracts might be expected to provide stronger tools for incentive alignment, though Gebel & Giesecke (2011) and Polavieja (2003) do not explicate this side of the incentive mechanism. However, it is important to explicate the differences between permanent contracts as rewards for easy to monitor employees, and permanent contracts as psychological contracts (Rousseau, 2001) or relational contracts (Brown, Falk, & Fehr, 2004), to overcome information asymmetries for difficult to monitor employees. The value of a permanent

contracts as a reward can readily be expected to be influenced by the objective security of that contract: more strongly protected contracts provide more income security, which is likely valued by employees. However, equally important might be the fact that, by offering a permanent contract, employers signal that they do not intend to dismiss the employee in the near future, by and large regardless of the objective protection of the contract. When permanent contracts exist to overcome information asymmetries, this signal becomes an essential element of the bargain, as employers implicitly signal the promise not to dismiss the employee, who in turn signals a promise to provide high effort (Brown, Falk, & Fehr, 2004). Crucially, this signalling effect seems less obviously influenced by the objective protection of permanent contracts, than by its symbolic meaning, which makes the relation between EPL and this mechanism *a priori* ambiguous. However, following Gebel & Giescke (2011), it is expected that:

H1a: difficult to monitor employees have a lower probability of being employed in a temporary contract, compared to easy to monitor employees.

H1b: This relation is positively affected (becomes stronger) by differences between the EPL for temporary and permanent contracts.

The buffer mechanism states that, given some volatility in product markets, employers hire employees on temporary contracts whom they can dismiss on relatively short notice, so as to prevent having to dismiss permanent employees (Gebel & Giesecke, 2011; Polavieja, 2003). This mechanism underlies the conceptualization of core-ring structures of organizations (Powell, 2001). Expectedly then, employers fill this buffer with employees for which replacement costs are low. Whether employees can be readily replaced with alternatives in the external market is, as transaction costs proposes, strongly influenced by the degree of firm-specific human capital needed to adequately perform their jobs (Emmenegger, 2009; Goldthorpe, 2000; Williamson, 1981). The build-up of firm-specific human capital is done through on the job training and experience, which requires investments by the employer in terms of paid training or foregone output (Williamson, 1981). Replacing employees with high levels of firm-specific human capital consequently requires employers to make the same investments again, which imposes costs on the replacement. Expectedly then, employers are driven to incorporate employees with high asset specificity into the organizational hierarchy by offering them permanent contracts, and reserve temporary contracts predominantly for employees with low asset specificity.

As employment protection legislation imposes costs on the replacement of employees, differences in the EPL for temporary and permanent contracts might be expected to affect the buffer mechanism. With higher differences between the protection of temporary contracts and permanent

contracts, the costs associated with dismissing core employees increasingly outstrip those of dismissing employees in the buffer. Consequently, employers will likely increase the size of the buffer as compared to the core, so as to run a decreasing risk of having to dismiss employees in the core. This is done either by creating new buffer jobs or replacing formerly core jobs with buffer jobs (Gebel & Giesecke, 2011). Either way, since buffer jobs are expectedly performed by employees with low asset specificity, and larger differences in EPL likely lead larger buffers, the strength of the relation between asset specificity and the probability of being employed in a temporary contract is expectedly stronger under higher EPLp EPLt differences.

H2a: employees with higher asset specificity have a lower probability of being employed in a temporary contract, compared to low specificity employees.

H2b: This relation is stronger in institutional environments where the protection of permanent contracts is higher as compared to the protection of temporary contracts.

2.3 Educational mechanisms and EPL differences

Even though it is here argued to be a problematic proxy of transaction cost mechanism, Gebel & Giesecke (2011) do find an interaction between educational attainment and the institutional protection of temporary and permanent contracts. Naturally, this might be precisely because it is a valid proxy for monitoring difficulties and asset specificity, but many more mechanisms have been argued to explain the relation between education and labour market outcomes. Often, these outcomes are formulated in terms of wages, but non-wage outcomes are expected to be related as well (Bol & Werfhorst, 2011; De Vries & Wolbers, 2005). Specifically in Europe, labour market inequalities in general might exist more strongly as differences in contracts for the low and high skilled, than as wage differentials (DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006). With regard to non-transaction cost mechanisms, human capital theory states that more time spent in education results in more productivity in the labour market, for which employers are willing to pay (Becker, 1964). Moreover, educational credentials might be used to overcome information asymmetries between employers and applicants (Bol & Werfhorst, 2011). They might serve as an indication of trainability, with higher degrees signalling more trainability, i.e. less training cost for the employer. Employers then rank employees in an imaginary labour queue, according to the expected cost of training them to function optimally (Thurow, 1975). This results in individuals with high degrees having first pick with regard to wages and job perks. In a similar vein, educational credentials might signal commitment, perseverance and ability, rather than just trainability, which are similarly valued

by employers (Bol & Werfhorst, 2011; Stiglitz, 1975). Finally, educational credentials might serve as a requirement for entering certain occupations, according to credentialist theories of occupational closure (Bol & Weeden, 2013). As credentials might be used to restrict the supply of labour into a particular occupation, employees have the ability to extract commensurate rents from employers, such as higher wages or secure contracts (Weeden, 2002).

If educational attainment net of transaction costs interacts with differences between EPLp and EPLt to influence the probability of temporary employment, educational attainment would be severely compromised as a as a proxy for transaction cost mechanisms: any results it yields would be ambiguous with regard to the underlying mechanism by which the deregulation of temporary employment contributes to skill-based inequalities in the risk of temporary employment. This interaction is expectedly present wherever educational attainment acts on the replacement costs of the employee, as it would trigger the same consideration with employers as asset specificity does. This is the case with occupational closure, as this mechanism operates primarily because of a restricted supply of employees: in closed occupations a replacement employee is not readily and freely available (Bol & Weeden, 2013), which imposes replacement costs on the employer (which are the consequent source of employee rents as argued in credentialist theories). However, in any case where it is assumed that educational mismatches exist and employers incur cost when redefining jobs, search cost are involved in replacing employees. More explicitly, when an undersupply of individuals at the high end of the educational distribution exists, and employers are not freely able to change their jobs to match this distribution, they incur costs when replacing highly educated employees. This has been referred to as the "congestion effect" (Andrews, Bradley, Stott, & Upward, 2008). More strongly still, even without educational mismatches recruiting new employees happens under incomplete information, which requires the employer to invest in screening prospective employees on their degree of trustworthiness and productiveness (Baron & Bishop, 1985; Schram, Brandts, & Gërxhani, 2010). As the opportunity costs of not screening properly likely increase with jobs' skill level, screening costs may increase with educational attainment. At any rate, whatever the source of replacement costs, they trigger the buffer mechanism. Consequently, finding support for H1 and H2 without controlling for a possible interaction between EPLp, EPLt and educational attainment leaves ambiguous whether the mechanism behind institutional differences in skill-based inequalities of temporary employment are predominantly driven by educational attainment, or transaction costs. Given the presented outline of the transaction cost mechanisms, it is proposed that the incentive and buffer mechanism exist net of the association with educational attainment, which Gebel & Giesecke (2011) find.

H3: The interaction between the institutional protection of temporary and permanent contracts and the buffer and incentive mechanism exists net of the interaction between educational attainment and the protection of temporary and permanent contracts.

3. Method

3.1 Data

The proposed hypotheses are tested using data from the European Social Survey (ESS) and its module on "Family, work and wellbeing", collected in 2004 (ESS round 2) and 2010 (ESS round 5). Since this study expands on Gebel & Giesecke (2011), the same sample of 15 European countries[1] is used to test the hypotheses. Since Italy and Austria do not have data for the 5th round of the ESS and France does not have contract-data for the 2nd round, this results in 27 country-years and, after all the controls are added, observations on 17031 employees. Additionally, data on Employment Protection Legislation is obtained from the OECD Employment database (OECD, 2012).

3.2 Operationalisation: dependent variable

The dependent variable of interest is whether an employee was employed on a contract of limited or unlimited duration in the year of the survey. The question asked is "do you have a contract of 1) unlimited duration, 2) limited duration, 3) do/did you have no contract, 8) don't know?". Since the focus is on employees on either permanent or temporary contracts, individuals who responded either 3 or 8 where dropped from the dataset, which leaves 87% of 17031 employees with permanent jobs and 13% of employees with temporary jobs. Unfortunately, it is not possible to determine whether these temporary contracts were offered by the daily employer, or whether employees came through an employment agency and are contracted out for a limited duration. This may have implications for the interaction with the protection of temporary employment, since the OECD indicator for the protection of temporary employment is an aggregate of the barriers to the use and treatment of both fixed term contracts and temporary employment.

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[1] Austria (AT), Belgium (BE), Denmark (DK), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), The Netherlands (NL), Norway (NO), Portugal (PT), Spain (ES), Sweden (SE), United Kingdom (UK)

3.3 Operationalisation: independent variables

The first independent variable of interest is the extent to which employees' performance is difficult to monitor for the employer. Unfortunately, a direct measure is not readily available in the ESS, so the degree to which employees have discretion in organizing their own work is used. The specific question asked was " (please tell me) how much the management at your work allows/allowed you to decide how your own daily work is/was organized?". Possible answers ranged from 1 "I have/had no influence" to 10 "I have/had complete control", and the assumption here is that, as employees' discretion increases, employers' ability to monitor their performance decreases. Obviously, this is an imperfect proxy of monitoring difficulties, as it could be argued that management might give employees some leeway in organizing their work, precisely because monitoring mechanisms are firmly in place. However, employers' capability to monitor employees' performance is generally increased by standardizing and routinizing tasks, which employees expectedly associate with having little freedom to organize their work. This would lend some validity to the proxy. Moreover, the answer to this question is likely dependent on employees' frame of reference, i.e. whether they compare their discretion to their own discretion last year, to colleagues' discretion, or to some ideal-typical job with "a lot of discretion", which is a general issue with these types of question. Mean scores on the variable increase consistently with educational and occupational level (see Figure 1), which supports its validity. However, quite some country differences remain in the average scores even after controlling for sector, educational level and occupation, which might cause some concern about the measure's consistency.

-Figure 1 about here-

The second independent variable of interest is the degree of firm-specific human capital employees possess. This is measured through the question "If somebody with the right education and qualifications replaced you in your job, how long would it take for them to learn to do the job reasonably well?". The possible answers were: 1) 1 day or less, 2) 2-6 days, 3) 1-4 weeks, 4) 1-3 months, 5) more than 3 months, up to 1 year, 6) more than 1 year, up to 2 years, 7) more than 2 years, up to 5 years, 8) More than 5 years. Since the time it would take for a potential replacement to do an employees' job properly adequately measures the extent to which human capital is acquired on the job, and the extent to which replacing the employee with that capital would mean foregoing output for the employer, it is argued to be a valid measure of the specificity of human capital.

However, as coded, the specificity variable violates the requirement that distance between the categories of ordinal variables be equal in order to treat them as interval variables. Since transforming the variable into 8 dummies makes interpreting the results difficult, the variable is used in the model as it is. Results on this variable are scrutinized by assessing a dummy version of the variable. In Figure 2, mean scores on the specificity variable are shown by 1-digit occupational category (ISCO88). As expected, elementary and service- and sales workers have low specificity, whereas technicians, professionals and senior officials have high specificity. On the face of it, the variable consequently seems sufficiently valid.

-Figure 2 about here-

The third dependent variable is educational attainment, which is measure on an adapted ISCED scale, from 1) "less than lower secondary education (ISCED 0-1)", to 5) "tertiary education completed (ISCED 5-6)". Responses 2-4 correspond straightforwardly to ISCED-categories 2-4. The distribution of educational attainment by country is shown in Figure 3:

-Figure 3 about here-

Finally, the protection of permanent contracts (EPLp) and the protection of temporary contracts (EPLt) are measured by the OECD indicators on employment protection legislation, which are obtained from the OECD employment protection database. Though these indicators are expectedly well-known, some remarks are in place. First, this study uses the traditional versions of the EPL indicators, rather than the recently update ones (Venn, 2009). Although the newly updated indicators contain more information on valid cases for the use of temporary agency employees and their rights to equal treatment, as well as permanent employees' maximum time to make claims of unfair dismissal, these indicators are only available as from 2008. Second, for ESS round 5, the indicators for 2008 are used, as no more recent versions are available. The country scores on the EPLp and EPLt variable for both waves are shown in Figure 4: 3 countries have deregulated the use of

temporary employment over the period (Finland, Portugal and Sweden), whereas only one has regulated it more strongly (Norway)[2].

-Figure 4 about here-

The hypotheses concern primarily the effect of "deregulation at the margins", which refers to the protection of permanent employment combined with the deregulation of temporary employment (Barbieri, 2009). Marginal deregulation is measured using the interaction of EPLp with EPLt, which results in three-way interactions in the models. EPLt has been recoded by multiplying it with -1, as to make it a measure of the deregulation of temporary employment: a low score on EPLt generates a high score on "deregulation of EPLt". Consequently, as EPLp and "deregulation of EPLt" increase, "deregulation at the margin" increases, and stronger effects of specificity and discretion are expected.

3.4 Estimation strategy

The proposed hypotheses are tested using multilevel logit models (individuals nested in countries) with fixed country effects and dummies for ESS round, in order to control for country and time effects. This modelling strategy allows for a strong test of the non-linearity in the specificity and discretion effects across levels of EPL, which are the prime focus of this study. An initial model is specified to estimate the linear effects of specificity and discretion on the probability of being employed in a temporary job, followed by a second and third specification to estimate three-way interactions between EPLp*EPLt and specificity and discretion, respectively. Finally, to relate the results from model 2 and 3 more directly to Gebel & Giesecke's (2011) findings, a fourth and fifth model are estimated to test whether any of the interactions from models 2 and 3 hold when an EPLp*EPLt*education interaction is included. Models 1 – 5 are shown below:

Model 1:

$$\Pr(tempjob = 1)_{ijt} = \alpha + \beta_1(specificity)_{ijt} + \beta_2(discretion)_{ijt} + \beta_3(D:country)_j + \beta_4(D:ESSround)_t + \left(\sum \beta_n x_{nijt}\right) + \varepsilon$$

Model 2:

[2] Italy regulated the use of temporary employment more strongly as well, but as said, no data on the 5th round of ESS is availlable fort hat country.

$$\Pr(tempjob = 1)_{ijt} = \alpha + \beta_1(specificity)_{ijt} + \beta_2\big((discretion)_{ijt} * (EPLp * deregEPLt)\big)_{jt} + \beta_3(D\!:country)_j + \beta_4(D\!:ESSround)_t$$
$$+ \left(\sum \beta_n x_{nijt}\right) + \varepsilon$$

Model 3:

$$\Pr(tempjob = 1)_{ijt} = \alpha + \beta_1\big((specificity)_{ijt} * (EPLp * deregEPLt)\big)_{jt} + \beta_2(discretion)_{ijt} + \beta_3(D\!:country)_j + \beta_4(D\!:ESSround)_t$$
$$+ \left(\sum \beta_n x_{nijt}\right) + \varepsilon$$

Model 4:

$$\Pr(tempjob = 1)_{ijt} = \alpha + \beta_1(specificity)_{ijt} + \beta_2\big((discretion)_{ijt} * (EPLp * deregEPLt)\big)_{jt} + \beta_3(D\!:country)_j + \beta_4(D\!:ESSround)_t$$
$$+ \beta_5\big((edu)_{ijt} * (EPLp * deregEPLt)\big)_{jt} + \left(\sum \beta_n x_{nijt}\right) + \varepsilon$$

Model 5:

$$\Pr(tempjob = 1)_{ijt} = \alpha + \beta_1\big((specificity)_{ijt} * (EPLp * deregEPLt)\big)_{jt} + \beta_2(discretion)_{ijt} + \beta_3(D\!:country)_j + \beta_4(D\!:ESSround)_t$$
$$+ \beta_5\big((edu)_{ijt} * (EPLp * deregEPLt)\big)_{jt} + \left(\sum \beta_n x_{nijt}\right) + \varepsilon$$

In these models, $\Pr(tempjob=1)_{ijt}$ refers to the probability that individual i in country j at time t is employed on a contracts of limited duration. Moreover, $specificity_{ijt}$ and $discretion_{ijt}$ refer to that individuals response to the relevant question, whereas edu_{ijt} refers to that individuals level of education attainment. $(EPLp*deregEPLt)_{jt}$ indicates the degree of deregulation at the margins in country j at time t, whereas $D\!:country_j$ refers to a dummy for country j, and $D\!:ESSround_t$ refers to a dummy for ESSround t. Finally, $\left(\sum \beta_n x_{nijt}\right)$ refers to a vector of n covariates for individual I in country j at time t. This vector contains socio-demographic variable like gender, age, years of education, household income and household size, as well as employment and job variables, such as weekly working hours, tenure in the company, occupation, whether the employee has ever been unemployed for a period of three months or more, whether the employee is covered by a union, whether the employee is charged with supervisory tasks, and the number of employees in the company, as well as the sector of economic activity.

Estimation of the models is done on the subsample of individuals in employment in the relevant waves of the ESS in 15 European countries. The self-employed and individuals working for the own family business are excluded. Moreover, employees in the armed forces are removed from the sample. In the end, this yields the 17031 observation mentioned in section 3.1.

4. Results

The relevant models are run with centred versions of the EPLp and deregEPLt variables, so main effects for specificity, discretion and educational attainment can be interpreted as the effect in an institutional environment with average protection of permanent and temporary contracts. The main effects for EPLp and deregEPLt and any two-way interactions are not shown in the table, as their interpretation is not directly relevant to the testing of the theoretical framework. The results for models 1-5 are shown in Table 1.

-Table 1 about here-

With regard to H1a, discretion is indeed negatively associated with the probability of being employed in a temporary job in model 1: as employees are employed in jobs with more discretion, their risk of a contract of limited duration decreases. This holds for specificity as well, as proposed in H2a and also shown in model 1. Additionally, educational attainment is negatively associated with the probability of temporary employment as well, which shows that the general transaction cost mechanisms and educational mechanisms exist independently. With regard to H1b, the negative effect of discretion on the risk of temporary employment indeed increases with the relative deregulation of temporary employment, as shown in model 2. As proposed in H2b and shown in model 3, the negative effect of asset specificity on the probability of being employed on a temporary contract increases with deregulation at the margins as well, however at borderline significance. Since these results are likely influenced by the non-linear nature of this variable, model 1 and 3 are tested with dummies for each category of specificity. These models are not shown, but in model 1 each dummy -save the 8th category- has a significantly lower coefficient than the reference category, which was the lowest category of specificity. Moreover, each dummy had a lower coefficient than the previous one, again save the 8th category. With regard to model 3, splitting specificity into dummies showed that the interaction effect rests predominantly on significant interactions with the 6th and 8th category. By and large, these results confirm that in general increasing specificity is related to a lower risk of a temporary contract, whereas high specificity employees see their risk reduced in high EPLp low EPLt environments. Notably, and disconfirming H3, both the interaction between deregulation at the margins and the discretion- and specificity mechanisms disappear when the interaction between educational attainment and deregulation at the margins is added, which is shown in models 4 and 5.

5. Discussion

The aim of this study was to shed light on whether and how institutional characteristics might influence skill-based inequalities in the risk of temporary employment. As a starting point was taken the notion that the partial deregulation of employment protection interacts with the buffering and incentive mechanism to increase the risk of temporary employment for employees with low asset specificity and low monitoring costs. Though taken from earlier research, this interaction has only been tested indirectly, using educational attainment as a proxy for asset specificity and monitoring costs. In this study, educational mechanisms and transaction cost mechanisms were rather presented as compatible explanations. First, it was tested whether, regardless of employment protection legislation, the risk of temporary employment was related to an employee's discretion, which served as a proxy for monitoring costs (confirming H1a). This was indeed supported by the results. However, discretion as a proxy for monitoring cost is naturally somewhat problematic. Expectedly, high discretion inhibits the employer's ability to monitor the employee's performance, but discretion might as well be granted because employers' can simply resort to monitoring an employee's output without regard to how that output was produced. At any rate, the results rest on the assumption that discretion is positively related to monitoring difficulties. Second, the probability of temporary employment was shown to be related to an employees' degree of specific human capital (confirming H2a), measured as the time it would take to train a possible replacement. Moreover, the strength of both of these mechanisms seemed to increase with when labour markets are increasingly "deregulated at the margins" (confirming H1b and H2b). Though concerns were expressed on the existence of this mechanism for monitoring (H1b), as a result of the decoupling of the subjective value of permanent contracts from their objective protection, these findings tentatively indicate that the objective protection of permanent relative to temporary contracts does influence their usefulness as an incentive. Deregulation at the margins was measured as the interaction between the protection of permanent employment and the deregulation of temporary employment, using the OECD time series indicators of employment protection regulation. As these indicators are not as encompassing as the more recent indicators (Venn, 2009), specifically with regard to the protection of temporary employment, results were tested with the more recent indicators as well. Models 1-5 were tested using the new indicators for 2008, as these are currently publically available (OECD, 2012). The results proved robust, with the exception of the specificity mechanism in model 3, which became insignificant. Given that the old and new indicators correlate strongly (0.97 for EPLp and 0.93 for EPLt), it is not surprising that the more significant mechanisms proved robust, whereas even minor differences in the indicators might be sufficient to push the borderline significant specificity mechanism into insignificance.

However, both the specificity and discretion mechanisms were subsumed by the interaction between educational attainment and marginal deregulation (disconfirming H3). This points to a spurious association where deregulation at the margins strengthens the educational effect on the risk of temporary employment, which is correlated with transaction cost explanations. For discretion and monitoring costs, this might be explained by the relation to task complexity. Tasks are deemed complex and place high cognitive demands on employees the more there are alternative ways of reaching a desired outcome, total desired outcomes,

conflicting desired outcomes, and uncertain means-to-end linkages (Campbell, 1988). Likely, educational attainment is positively related to task complexity through its relation to the cognitive capabilities required to perform complex tasks. Moreover, discretion and monitoring difficulties are likely positively related to complexity, since the ambiguity with regard to the outcomes of complex tasks makes standardization and output monitoring increasingly ineffective tools more management. If so, employers selecting employees for difficult to monitor jobs likely search for highly educated employees, whom they are likely to offer permanent contracts, either as a reward for their high human capital, their trainability, or because of occupational closure. Insofar as educational attainment then affects the replaceability of the employee, an interaction with deregulation at the margins is expected, which subsumes the incentive mechanism. Human capital specificity, specifically when measured as the time needed to master a job, might be related to educational attainment when employers use educational attainment as a signal of a prospective employee's trainability. If higher educational attainment signals increased trainability, employers are expectedly likely to select higher educated applicants for jobs with a long period of required on the job training. Again, through the increased replacement costs that higher educated individuals carry, this mechanism is likely related to marginal deregulation.

Even if not through transaction costs, this study shows that marginal deregulation is related to skill-based inequalities in the risk of temporary employment. These inequalities are likely to exist in "deregulated" labour markets as well: thought the United States' labour market is governed by low employment protection, job tenure is still shorter in low-skill strata than high-skill strata (Kalleberg, 2011). However, either or not formalizing these skill-based inequalities in contract is not a trivial difference, as temporary contracts might be a basis for discrimination in their own right, e.g. with regard to the ability to obtain a mortgage. When skill-based inequalities in the labour market are formalized, they might consequently feed broader inequalities in society at large. Moreover, when temporary contracts become a predictor of future temporary employment, i.e. temporary employment "traps" the low-skilled, it not only feeds current inequalities, but becomes a basis for future inequalities by stifling social mobility. It is not argued that the "deregulated" labour market should considered as the solution to skill-based inequalities in temporary employment, since the extreme skill-based inequalities in income they foster are detrimental in their own right. However, when policy-makers wish to intervene in the labour market, this study does argue in favor of accounting for the balance between the protection of temporary and permanent employment.

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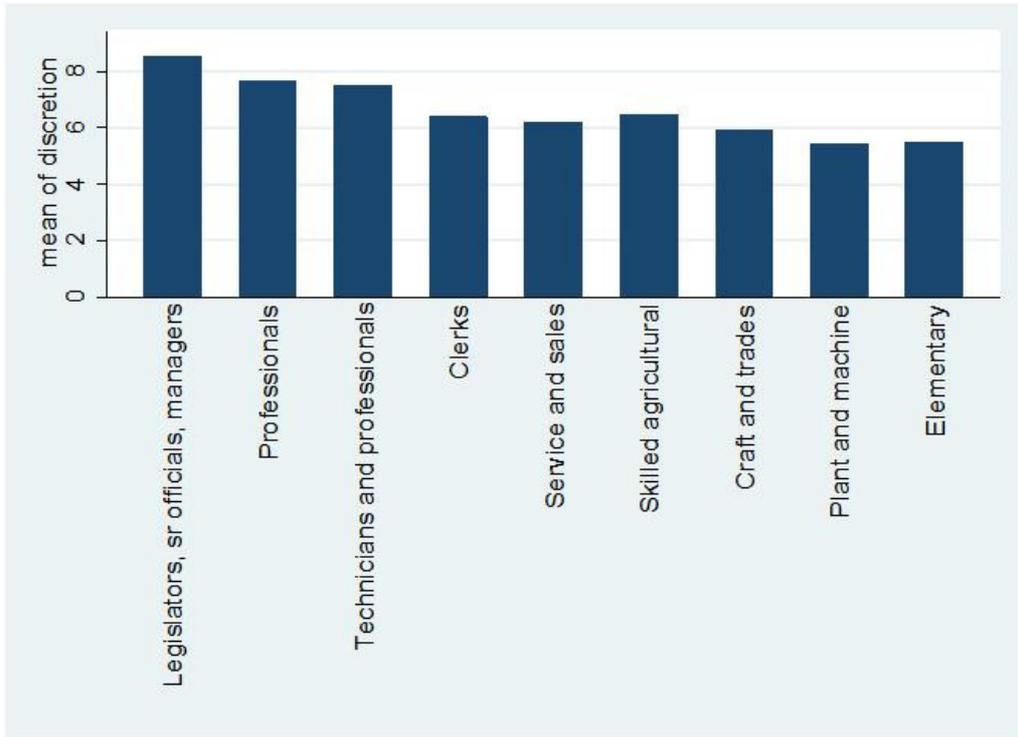
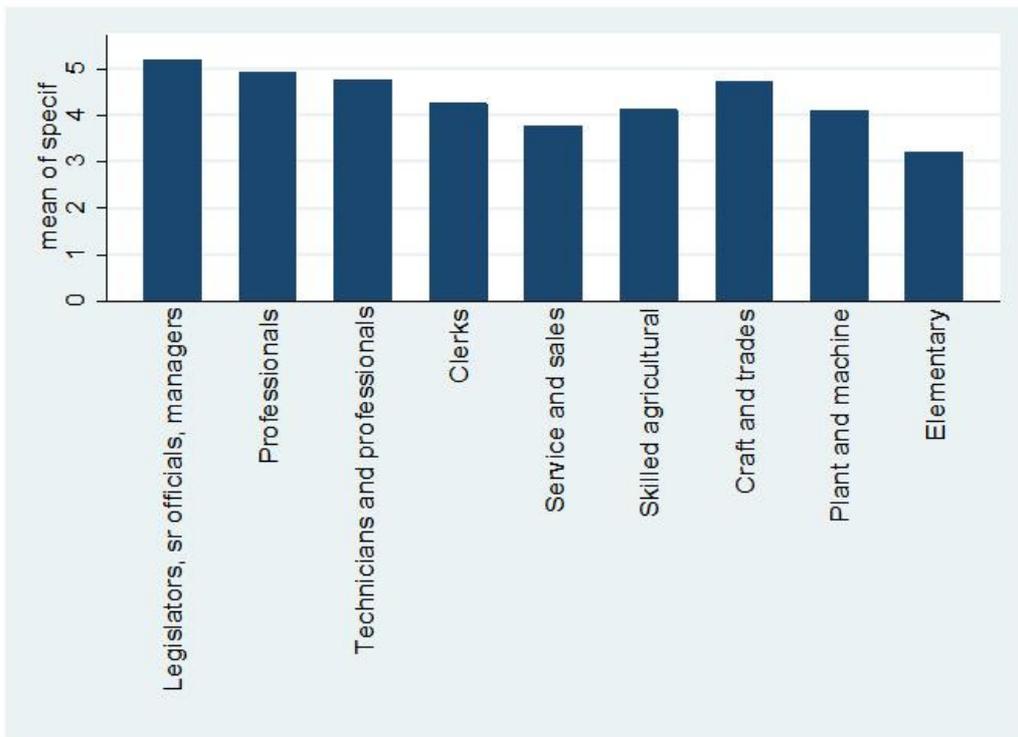**Figure 1: Mean discretion by 1-digit occupational category (ISCO88)**

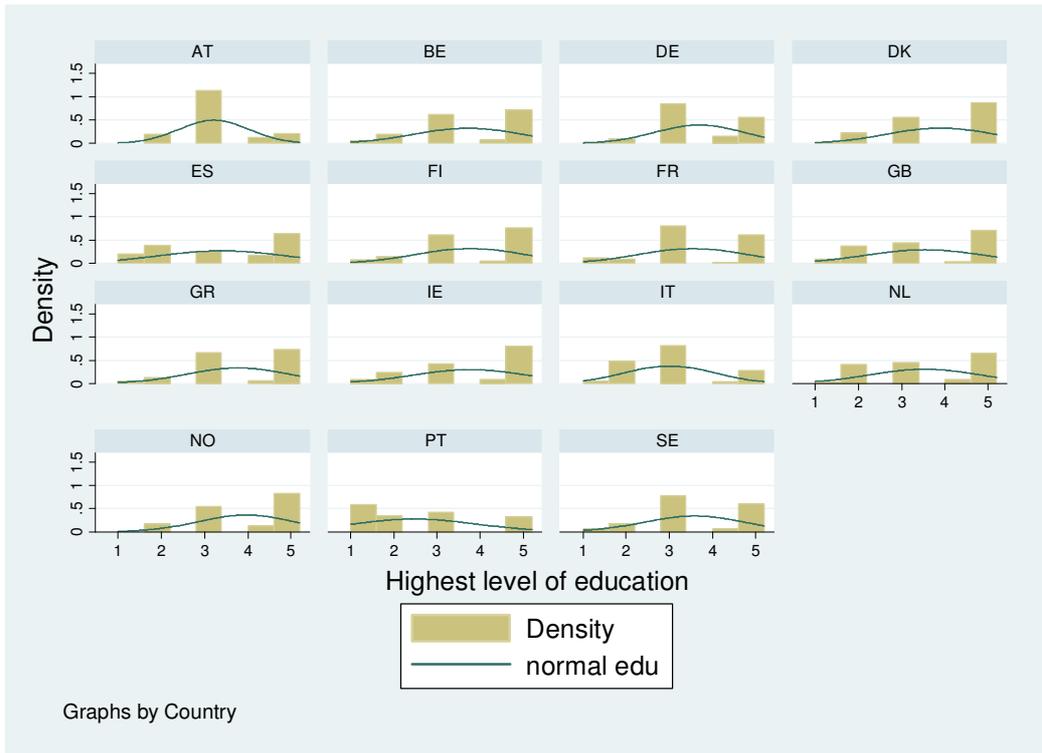**Figure 2: Mean specificity by 1-digit occupational category (ISCO88)**

Figure 3: Distribution of educational attainment (ISCED) by country

Figure 4: Employment protection legislation by country: the Protection of permanent employment is shown on the vertical axis and the protection of temporary employment on the horizontal axis. Labels indicate the values per ESS-round (2 for 2004, 5 for 2010).

Table 1: Results from multilevel logit models with fixed country and time effects, and temporary job as the dependent variable. Analysis are run on 27 country-years for ESS round 2 and 5.

	(1)	(2)	(3)	(4)	(5)
	tempjob	tempjob	tempjob	tempjob	tempjob
discretion	-0.0232***	-0.0243***	-0.0225***	-0.0233***	-0.0226***
	(-6.55)	(-4.25)	(-6.51)	(-4.57)	(-6.53)
specificity	-0.0636***	-0.0636***	-0.0686***	-0.0642***	-0.0672***
	(-4.55)	(-4.56)	(-4.98)	(-4.62)	(-5.15)
educational attainment	-0.0571*	-0.0566*	-0.0578*	-0.0735**	-0.0722**
	(-2.26)	(-2.28)	(-2.32)	(-3.76)	(-3.61)
specificity*EPLp*deregEPLt			-0.0303+		-0.0199
			(-1.67)		(-1.07)
discretion*EPLp*deregEPLt		-0.00953*		-0.00382	
		(-2.59)		(-0.90)	
eduactional attainment*EPLp*deregEPLt				-0.0525**	-0.0462*
				(-3.44)	(-3.24)
Covariates	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes
Wave dummies	yes	yes	yes	yes	yes
N	17031	17031	17031	17031	17031

t statistics in parentheses

+ $p<0.10$, * $p<0.05$, ** $p<0.001$, *** $p<0.0001$