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FLEXIBLE EMPLOYMENT, PRECARIOUS EMPLOYEES?

Job-, employer-
and institutional
explanations for
numerical
flexibility, and
its relation to
precarious
employment.

This dissertation presents a study of numerical flexibility and its relation to precarious employment in contemporary labour markets. Precarious employment is defined as the situation in which an employee has both insecure employment and insecure finances. More specifically, precarious employees are employees who are employed on a numerically flexible contract, while having low earnings, a high risk of unemployment and low unemployment benefit entitlements. The study addresses the relation between job characteristics and the performing employee's risk of being employed on a numerically flexible contract. Additionally, it investigates how employers' HRM attitudes relate to their use of numerical flexibility. Having given an account of numerical flexibility, the relation between numerical flexibility and precarious employment is explored, as well as the how characteristics of the institutional environment act upon this relation, specifically with regard to employment protection, minimum wages, collective bargaining and unemployment benefits. In the end, this dissertation aims to provide an encompassing account of precarious employment, and how institutions may serve to lessen its prevalence.

FLEXIBLE EMPLOYMENT, PRECARIOUS EMPLOYEES?

MARTIN OLSTHOORN

Martin Olsthoorn

Flexible employment, precarious employees?

Job-, employer- and institutional explanations for numerical flexibility, and its relation to precarious employment.

Flexible employment, precarious employees?

Job-, employer- and institutional explanations for numerical flexibility, and its relation to precarious employment.

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At some point back in 2010, while finishing my master's thesis, someone asked me if I had ever considered doing a PhD. I hadn't. But now that I did consider it, I had no way of knowing if I wanted to do a PhD. Luckily, that same person had a short test to establish if writing a dissertation might be something I would enjoy. "Did you enjoy writing your master's thesis enough to apply the same amount and intensity of focus to a subject for four years instead of three months?", he asked. If I did, I should seriously consider the idea. At the time I mainly thought it wasn't much of a sales pitch, but I always remembered this question. I answered with a "yes" and here I am, at the far end of a four year project that I loved doing. I loved it in no small part because of others, whom I will thank in no particular order.

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When I started my PhD, I thought of myself as a bit of a loner when work was concerned. As the project moved along however, I realized how much I valued the daily interaction with my colleagues. For this reason I liked moving to a new building in the final year of my research, although I do realize that loving

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Chapter 1

Introduction

1.1. Introduction

In recent decades, labour markets have witnessed a substantial growth in flexible employment (Kalleberg, 2011; Rodgers & Rodgers, 1989), which refers to temporary (i.e., fixed-term) employment, temporary agency employment, self-employment, and flexitime (i.e., employment that allows for periodic variations in working hours). Flexible employment has grown to the extent that significant sections of the labour pool in many countries are now employed flexibly.

Scholars from many academic disciplines have devoted studies to the causes and consequences of these developments. In sociology and economics, substantial attention has been devoted to the roles that market volatility and globalisation play in influencing employers' tendency to hire staff flexibly (Abraham, 1988; De Graaf-Zijl, 2005; Foote & Folta, 2002; Houseman, 2001; Kalleberg, 2011; Powell, 2001) and the jobs most likely to be made flexible (Breen, 1997; Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003; Polavieja, 2003). Additionally, sociologists and economists alike have explored the country-level institutional characteristics conducive to flexible employment (Barbieri, 2009; DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006; Gebel & Giesecke, 2011; Muffels & Luijkx, 2008; Polavieja, 2003) and the effects that flexible employment has on employees' wages (Booth, Francesconi, & Frank, 2002; Davia & Hernanz, 2004; De Graaf-Zijl, 2012; Mertens, Gash, & McGinnity, 2007). In sociology and anthropology, research has focussed on the demographic and socio-economic characteristics of those employees most likely to be employed on a flexible contract with respect to gender (Cranford, Vosko, & Zuckewich, 2003; Vosko, 2002), age (Barbieri, 2009), and immigrant status (Ahmad, 2008; Porthé, et al., 2010). In sociology and political science, research has focussed on the consequences of flexible employment for employees' voting behaviour (Rueda, 2005) and preferences regarding the welfare state (Burgoon & Dekker, 2010; Paskov & Koster, 2014). In psychology and the health sciences, the consequences of flexible employment have been extensively researched and discussed, specifically in terms of psychological consequences (Benach & Muntaner, 2007; Fouad & Bynner, 2008; Friel & Baker, 2009) and the effect on work-related injury (Benach & Muntaner, 2007; Lewchuck, Wolff, King, & Polanyi, 2003).

One of the dominant forms of numerical flexibility used in Europe is temporary employment, i.e. employment on a fixed-term or temporary contract. Figure 1.1 depicts the proportion of employees on a temporary contract in the highest and lowest quartiles of the earnings distribution, per country. As Figure 1.1 shows, high earners are less likely to be in temporary employment in all 21 countries included in the figure, but this tendency is clearly more pronounced in certain countries than in others. A first question that might be raised when looking at Figure 1.1 is why there is such substantial *within-country* variation in employees' risk of temporary employment.

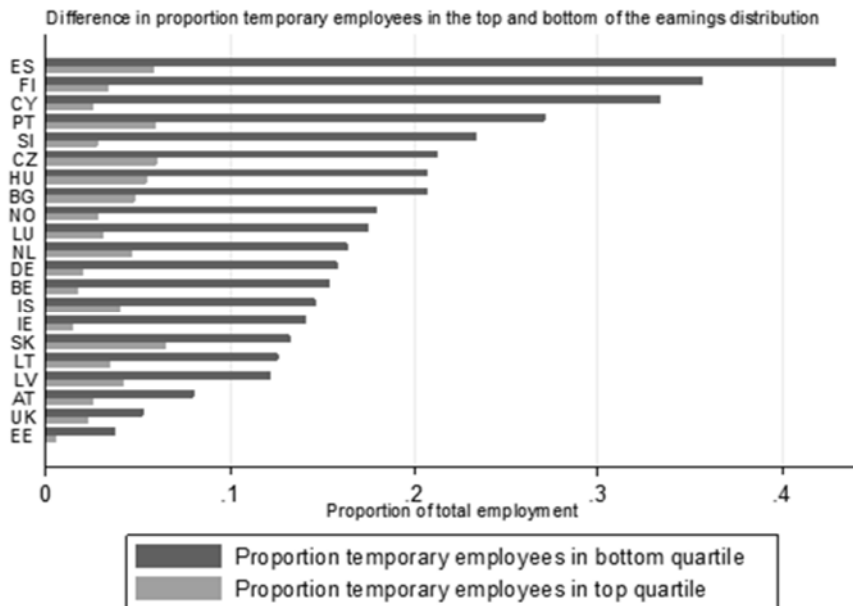


Figure.1.1: The differences in the proportion of temporary employees in the top and bottom quartiles of the earnings distribution (source: EU-SILC, values are mean values over the 2004-2009 waves).

This question has received substantial scholarly attention and has been addressed by looking at differences across economic sectors, and through the lenses of job content and employees’ educational attainment. For instance, employees in jobs that require them to work autonomously are argued to be less vulnerable to being made flexible due to information asymmetries between employee and employer. Jobs lacking these information asymmetries, however, are more vulnerable and even more so when market volatility increases (Breen, 1997; Gebel & Giesecke, 2011; Goldthorpe, 2000). Jobs that require employers to invest in employee training before the latter can be fully functional are likewise less likely to be made flexible (Master & Miles, 2002), and highly educated employees also exhibit a lower risk of flexible employment (De Vries & Wolbers, 2005).

A second question that might be raised when looking at Figure 1.1 is why there is such substantial between-country variation in the distribution of temporary employees. In the United Kingdom, approximately 5% of employees in the lowest quartile of the earnings distribution are employed on a temporary contract compared to 2% in the top quartile, whereas the corresponding figures in Spain are more than 40% and approximately 6%, respectively. This issue has received attention from academics and policymakers alike, and explanations often refer to differences in Employment Protection Legislation and Active Labour Market Policies between countries (Muffels & Luijkx, 2008). The weak protection

of permanent contracts may explain the low overall levels of temporary employment in the United Kingdom, whereas the strong relative deregulation of temporary employment may explain the substantial inequality in Spain (Gebel & Giesecke, 2011; Polavieja, 2003).

A third and final question concerns the extent to which the large numbers of temporary employees in the bottom of the earnings distribution are secure in their ability to maintain their financial security, i.e., to what extent their employment is precarious. Scholars have argued that the risk of flexible employment is related to low education, low job autonomy and low levels of firm-specific skills, and hence one would expect flexible employment to often be accompanied by low earnings. Substantial research has recently addressed the question of the extent to which employment precariousness is on the rise, the most notable contribution being by Kalleberg (2011). Defined in Chapter 2 as the intersection between employment insecurity and financial vulnerability, precarious employment appears to have become a more salient issue as the use of flexible employment has increased and wage growth has stagnated (Kalleberg, 2011; Standing, 2011).

This dissertation aims to address these questions. To explain inequalities in employees' risk of a flexible contract, it investigates job- and employer-level explanations for employers' use of flexible employment. To explain why inequalities in employees' risk of temporary employment differ between countries, this dissertation investigates the relation between a country's labour market institutions and the mechanisms that produce these inequalities. Here lies the first main contribution of this dissertation. It contributes to the literature on flexible employment by providing an account of how employers' need for flexibility results in a risk of a flexible contract for employees in different jobs, and how institutions mediate this relation. Additionally, this dissertation assesses whether flexible employees are at risk financially and how institutions may serve to mitigate these risks. Here lies the second main contribution. By providing an integrated definition and assessment of the concept of precarious employment, this dissertation provides resources for researchers and policymakers seeking to address the issue of precarious employment. The central proposition of this dissertation is that employers consider job characteristics when deciding which employees to employ on a flexible contract and that employers are sensitive to institutional restrictions when conducting cost-benefit analyses associated with flexibility. However, employers may decide to forego using flexible contracts when these conflict with their attitudes towards Human Resource Management (HRM). Additionally, the characteristics that place employees at risk of flexible employment simultaneously place them at risk of low earnings, thereby creating the risk of precarious employment. However, inclusive institutions may mitigate these effects.

This chapter provides a brief overview of the main theoretical issues and considerations underlying this dissertation. This is followed by an overview of the research questions, the theoretical framework and methodology, and finally, an overview of the main chapters of this dissertation.

1.2. Numerical flexibility and precarious employment

First, it is important to define one of the central concepts of this dissertation. Flexible employment¹ refers to types of nonstandard employment that grant the employer the possibility to 1) vary employees' working hours on short notice or to 2) dismiss them with comparatively low costs. The former distinguishes flexible employment from part-time employment with non-variable hours, while the latter distinguishes flexible employment from employment on open-ended contracts. Flexible employment differs from labour market flexibility, which refers to the ability of the labour market to adapt to shocks by rapidly adjusting labour supply to meet labour demand. However, the two concepts are related in the sense that flexible employment may serve to provide labour market flexibility in otherwise rigid labour markets (DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006). Finally, flexible employment refers to numerical flexibility rather than functional flexibility. Consequently, flexible employment refers to flexibility obtained by expanding and downsizing the labour force with respect to hours worked and employees hired rather than to flexibility obtained by training multi-skilled employees and assigning them to different jobs contingent on product-market dynamics (Kalleberg, 2001; Smith, 1997). A cautionary note with regard to terminology is that the term flexible employment as described above might be confused with the term "flexible contract", which often refers to a contract with working hours that may vary on short notice. A flexible contract is numerically flexible, but numerical flexibility can also be achieved by means other than flexible contracts, e.g., through temporary contracts.

Throughout this dissertation, an effort is made to consistently refer to the central concept of flexible employment, which refers to types of nonstandard employment that allow the employer to vary employees' working hours or to dismiss them with comparatively low costs, as "numerical flexibility" or "numerically flexible employment". Flexible contracts, which refer only to contracts with working hours that may vary on short notice, are referred to as "flexitime". Moreover, permanent contracts refer to employment contracts lacking a pre-specified date for termination, which may also be referred to as open-ended contracts.

¹ Precarious employment is defined in Chapter 2

1.2.1. Employers, jobs, and numerical flexibility

When assessing the predictors of numerical flexibility, the primary units of analysis in this dissertation are the employer, the job and the institutional context. Figure 1.2 depicts the variation in the proportion of the payroll hired on flexible and temporary contracts across employers, by sector of economic activity, in the Netherlands (see also Chapter 3). This figure clearly indicates that in all sectors of economic activity in the Netherlands, the majority of employers hire some proportion of their workforce on a temporary contract. The figures for flexitime are less dramatic but nevertheless considerable in most sectors.

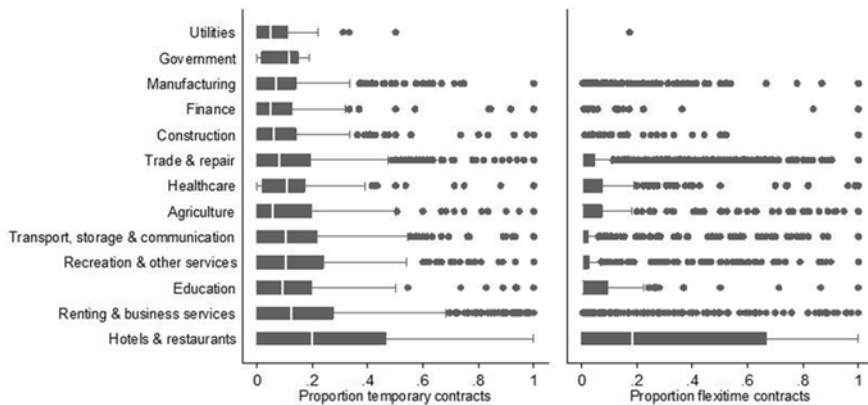


Figure 1.2: Boxplots of the company-level proportion of temporary and flexitime contracts (horizontal axis) per 1-digit sector. Data: Arbeidsinspectie, Arbeidsvoorwaardenonderzoek (2003 – 2007). Flexitime contracts refer to employment contracts that allow the employer to assign employees a non-fixed number of working hours per week or month, such as on-call contracts. Temporary contracts refer to fixed-term contracts, which allow the employer to terminate or renew the employment contract after a fixed period of time.

Generally, employers increase their use of numerical flexibility in response to increased volatility in product markets, i.e., when the desired output varies over time or becomes more uncertain (Abraham, 1988; Houseman, 2001; Kalleberg, Reynolds, & Marsden, 2003). As might be expected, this relationship is rooted in the assumption that employers are profit maximisers, who seek to keep their adjustment costs low in the presence of increasing volatility (De Graaf-Zijl, 2005; Foote & Folta, 2002; Matusik & Hill, 1998). Sociologists argue that employers mirror one another's staffing policies in uncertain environments, which would exacerbate the relationship between volatility and numerical flexibility, provided that volatility implies unpredictability (DiMaggio & Powell, 1983). As a counterweight to these relatively deterministic explanations of employer behaviour, theories on managerial ideology and psychological contracts allow greater latitude for employers' preferences with respect to human resource management (HRM) to influence their approach to numerically flexible staffing. Specifically, employers with a stakeholder view of the organisation are argued to

favour more inclusive staffing strategies (Geare, Edgar, & McAndrew, 2009), and employers who value commitment are argued to favour incorporating employees into the organisational hierarchy (Coyle-Shapiro & Kessler, 2002; Guest, 2004; Osterman, 1987; Rousseau, 1989).

One of the main issues this dissertation addresses is what job characteristics are associated with an employer hiring an employee on a numerically flexible contract. A particularly promising framework to address this issue was first systematically formulated by Williamson (1981) in his discussion of transaction costs and applied more rigorously to employment relations by Goldthorpe (2000). A transaction cost approach identifies the job characteristics that have implications for the efficiency of “make” versus “buy” decisions regarding the required labour (Goldthorpe, 2000; Master & Miles, 2002; Williamson, 1981). Because numerical flexibility is a way to mimic “buy” decisions with respect to employment relations, transaction cost approaches are uniquely suitable to explain the relation between numerical flexibility and job characteristics. Transaction costs have been argued and shown to have profound implications for the allocation of numerical flexibility (Gebel & Giesecke, 2011; Polavieja, 2003) and to interact with market volatility to change the allocation of numerical flexibility over time and between sectors of economic activity (Breen, 1997).

1.2.2. Institutions and numerical flexibility

The prevalence of numerical flexibility differs markedly between countries. In part, this is a result of different international approaches to facilitating labour market adjustment (DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006). Continental and Mediterranean welfare states have facilitated labour market adjustment by allowing employers to adopt a plethora of numerically flexible contracts, whereas employers in Anglo-Saxon welfare states have greater flexibility in wage setting and may more easily dissolve permanent contracts (Barbieri, 2009; DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006). Moreover, researchers suspect that specific institutions influence the prevalence of numerical flexibility and the extent to which it excludes employees from future permanent employment. Rueda (2005) and Pontussen (2005), for instance, argue that employment protection may have the effect of securing jobs for labour-market insiders while increasing the difficulty for outsiders to obtain secure jobs and escape numerical flexibility.

The specifics of Employment Protection Legislation have been shown to affect the degree to which labour markets are divided between employees on secure open-ended contracts in the “core” of the labour market, and employees on insecure numerically flexible contracts in the “periphery” of the labour market (Barbieri, 2009; DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006; Golsch, 2003). In addition, these institutions influence the degree to which transitions between the core and the periphery occur or, in other words, how strong this separation

between insiders and outsiders actually is (Muffels & Luijckx, 2008). This touches on policy discussions on the phenomenon of “flexicurity”, which refers to a labour market’s capacity to provide flexibility to employers and security through high employability for employees (Wilthagen & Tros, 2004). Although certain institutional arrangements are associated with higher transition rates between the core and the periphery than others, in most environments, current numerical flexibility is a reliable predictor of future numerical flexibility (Booth, Francesconi, & Frank, 2002; Giesecke & Gross, 2003).

1.2.3. Numerical flexibility and precarious employment

Rodgers & Rodgers (1989) defined precarious employment as the situation in which employment does not provide employees with the security of a minimum standard of decent living. This resonates with the use of the adjective “precarious” in everyday language and with the use of *precarité* and precariousness in earlier academic and political discourse (Barbier, 2004; Schnapper & Villac, 1989). Part of the (in)security concerning a minimum standard of decent living naturally relates to the stability of employment and thus to numerical flexibility. However, the potential financial insecurity resulting from numerically flexible employment might be mitigated by high employability, a high wage, or secondary sources of income such as unemployment benefit entitlements or an additional source of household income.

Economic theories of compensating differentials suggest that numerically flexible employees are rewarded for the risk they carry and thus earn more than employees on open-ended contracts (De Graaf-Zijl, 2005a; Rosen, 1974). Insider/outsider theory and theories of exploitation instead suggest that numerically flexible employees are dependent on the employer and thus less able to influence wage negotiations than employees on open-ended contracts (Lindbeck & Snower, 1988; Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve, 2011). The evidence generally accords with the predictions of insider/outsider theory and theories of exploitation (Picchio, 2006). However, from the perspective of employees’ financial security, discussions on the independent effect of numerical flexibility on earnings are less relevant than their actual earnings. Here, the fact that numerically flexible employees have lower educational attainment and lower occupational status (Gebel & Giesecke, 2011) translates into them generally receiving low real earnings, which implies a decreased ability to save for unemployment and ensure financial security.

Research on the trapping effect of temporary employment indicates that numerically flexible employees are more likely to remain in numerically flexible employment or to exit into unemployment than are employees on open-ended contracts (Muffels & Luijckx, 2008; Polavieja, 2003). Temporary employees thus have lower employability than employees on open-ended contracts. Although

they likely have low employability and comparatively low earnings, generous unemployment benefit entitlements may serve to decrease or eliminate employees' financial insecurity. However, numerically flexible employees' low real earnings directly feed into low real unemployment benefits in systems in which the monthly amount of benefits received is proportional to earnings before unemployment. Moreover, evidence suggests that rules and regulations that condition the duration of unemployment benefits on the period of contribution disfavour numerically flexible employees (Eurofound, 2003; Leschke, 2006). This likely results from the fragmented employment trajectories that numerically flexible employees tend to have as demonstrated, for example, by the trapping effect of temporary employment.

1.3. Research questions

The major question motivating this dissertation addresses the issue of precarious employment:

MQ: How is precarious employment explained by job-, employer- and institutional characteristics?

Because the main research question is too broad to be addressed at once, it is divided into three separate research questions. The aim of these three questions is to provide employer- and job based explanations for employees' risk of numerical flexibility, to assess how numerical flexibility may result in precarious employment, and how institutions may interact with these relations. Because numerical flexibility is considered a *condition sine qua non* for precarious employment, the first research questions address the relationship between job characteristics, institutions and numerical flexibility. A second question addresses the relation between employers' HRM attitudes and their use of numerically flexible contracts. A third research question addresses the relationship between numerical flexibility and precarious employment. These sub-questions are introduced below.

Transaction costs have been argued and shown to influence employers' tendency to resort to numerical flexibility and relate to the jobs for which employers hire employees on numerically flexible contracts. However, research in this area often relies on educational attainment as a proxy for transaction costs (see: Gebel & Giesecke, 2011) or on indicators of employers' or employees' evaluations of the transactions costs associated with replacing or monitoring an employee in a certain job (e.g., how long would it take to train a potential replacement for employee x in job y? See: Master & Miles, 2002). How the actual content of the job, i.e., the nature of the tasks the employee is supposed to perform, relates to employers' tendency to use numerical flexibility based on the job's implications for transaction costs is markedly less well studied. Additionally,

little is known about the effect that institutional arrangements may have on employers' decisions to make certain jobs numerically flexible instead of others. It has been argued that the relative deregulation of temporary employment at the macro-level interacts with transaction-cost mechanisms at the micro-level (Gebel & Giesecke, 2011; Polavieja, 2003). However, the validity of this claim has either been inferred from labour market outcomes that ostensibly support the proposed mechanisms, but are not explicitly related to indicators of transaction costs (see: Polavieja, 2003), or by measuring transaction costs by using educational attainment as a proxy for skill specificity and autonomy (see: Gebel & Giesecke, 2011). Although the mentioned studies were pivotal in increasing understandings of micro-level mechanisms, and the macro-level influences on these mechanisms, the transaction cost nature of these interactions remains to be assessed. To address these issues, a first research question is formulated.

Q1: How are employers' decisions to offer numerically flexible contracts to employees explained by characteristics of the job, and how do institutions relate to these decisions?

Studies have largely depicted employers as reacting to job and institutional characteristics in a uniform manner. Crudely put, studies have not allowed two similar employers in the same institutional environment to differ in their tendency to use numerical flexibility for similar jobs. However, HRM theories on management ideology, corporate culture and psychological contracts, have established that employers may adopt certain HRM strategies regarding employment relations in lieu of others, because they consider those strategies preferable (Edwards, 2010; Geare, Edgar, & McAndrew, 2007; Golsch, 2003; Guest, 2004; Rousseau, 1989). Although a notable exception is provided by Geare, Edgar, and McAndrew (2009), who survey a large sample on managers on their attitude with regard to employment relations and HRM attitudes with regard to high commitment management, these propositions have not generally been quantitatively assessed, and not specifically regarding their implications for employers' tendency to staff flexibly. This issue is addressed in a second research question:

Q2: How is employers' use of numerically flexible contracts related to their HRM attitudes?

Numerical flexibility has been extensively researched, but its implications for precarious employment are less well known. Many scholars have addressed the issue of precarious employment but do not sufficiently distinguish precarious employment from numerical flexibility (see: Barbier, 2004; Kalleberg, 2011; Quinlan, Mayhem, & Bohle, 2001). As a result, broad research into the financial risks associated with numerical flexibility has been scarce and must be assembled from research into earnings differentials (De Graaf-Zijl, 2012; Davia & Hernanz, 2004; Mertens, Gash, & McGinnity, 2007), the trapping effect of temporary

employment (Booth, Francesconi, & Frank, 2002; Muffels & Luijkx, 2008) and sporadic research on the influence of institutions governing unemployment benefit entitlements (Leschke, 2006). To bridge these literatures, a third and final research question is formulated:

Q3: How is employers' use of numerical flexibility related to precarious employment, and how do institutions mediate this relationship?

1.4 Theoretical framework

Because the central question of this dissertation addresses the issue of precarious employment, it is pivotal to define this concept before beginning the investigation. From an extensive review of the literature on precarious employment, from its philosophical roots (Barbier, 2004) to its subsequent adoption in a variety of disciplines (Rodgers & Rodgers, 1989; Benach & Muntaner, 2007), the consensus appears to be that an employee is precariously employed when both his or her employment and finances are insecure. Specifically, employees are precariously employed when they are hired on a numerically flexible contract, have a high risk of unemployment, low earnings, low unemployment benefits and a low supplementary income. Further investigation of supplementary income, however, is beyond the scope of this dissertation. This conceptualisation provides the structure for this dissertation and is depicted on the right side of Figure 1.3 and outlined in more detail in Chapter 2. This dissertation first studies the job, employer and institutional characteristics related to numerical flexibility. Second, the relationship between numerical flexibility and unemployment risk, on the one hand, and earnings and unemployment benefits, on the other hand, is addressed.

Given the numerous potential micro- and macro-level explanations for numerical flexibility and precarious employment, this dissertation has necessarily been limited to a subset of these possible explanations. This dissertation relies on transaction cost theories to explain the job characteristics associated with numerical flexibility: transaction costs provide promising explanations for numerical flexibility and have the important advantage of providing a means of linking numerical flexibility to precarious employment. This advantage is discussed more later. To explain how employers' HRM attitudes may influence employees' risk of numerical flexibility, this dissertation relies on theories from the psychology and sociology of organisations because these theories provide insights in to the relationship between employers' HRM attitudes and their decisions with regard to employment contracts. When addressing institutional influences on precarious employment, the abundance of potentially relevant institutions requires the dissertation to be limited to institutions that appear most obviously associated with the outcomes to be explained: namely Employment Protection Legislation when numerical flexibility and unemployment risks are

concerned, Wage Setting and Minimum Wage Legislation when wages are concerned, and regulations regarding Unemployment Benefit Entitlements when unemployment benefits are concerned. It is acknowledged that by being restricted to these theories and institutions, this dissertation may not do justice to the wealth of potential explanations for numerical flexibility and precarious employment. Even without studying all possible explanations this dissertation nevertheless offers an encompassing analysis of precarious employment.

A broad outline of the theoretical framework underlying this dissertation is presented below. This framework is summarised in Figure 1.3. The overview of the theoretical framework is followed by an overview of the most important methods and data used.

1.4.1. Transaction costs and numerical flexibility

To address research question 1, this dissertation studies the relationship between job characteristics and numerical flexibility. Additionally, it is assessed how institutions designed to provide employment security mediate this relationship. Specifically, the focus is on the role of Employment Protection Legislation (EPL). The relationships between job characteristics and numerical flexibility, as well as the influence of institutions thereon, are depicted in Figure 1.3 and studied in Chapters 3 and 4.

Chapters 3 and 4 utilise insights from transaction cost theory to study the micro-level mechanisms that make certain jobs more conducive to numerical flexibility than others. The central proposition of this theory is that the tasks associated with a specific job have implications for the degree to which employers are able to monitor the performance of the employee performing the job and the degree to which the employee accumulates firm-specific skills (Goldthorpe, 2000; Williamson, 1981). The desire to monitor the employee follows from the notion that the employment relationship is essentially one between a principal (the employer) and an agent (the employee), with potentially diverging interests and concomitant attempts by the principal to prevent self-interested behaviour by the agent (Goldthorpe, 2000; Shapiro, 2005). Because complex tasks are associated with insecurity regarding input, output, and means-to-end linkages (Campbell, 1988), increasing job complexity implies that directly monitoring the employee performing the job places increasing demands on the employer's resources. At extremely high levels of job complexity, the employer would need to hire a supervisor with the exact knowledge necessary to perform the job, which Goldthorpe identified as an "infinite regression" (Goldthorpe, 2000; p218). At high levels of job complexity, the employer is thus forced to grant the employee a degree of autonomy. In complex jobs, autonomous employees may shirk and "carrot and stick" approaches to incentives are ineffective due the unavailability of employee performance data (given the insecurity of inputs and outputs).

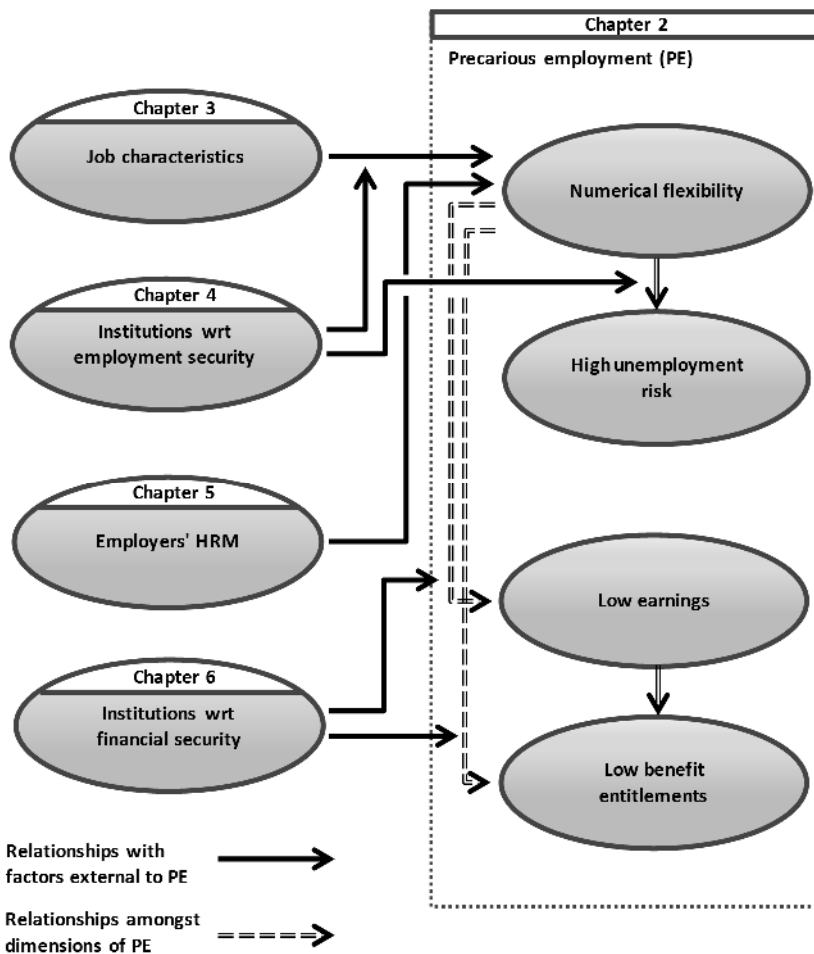


Figure 1.3: A schematic overview of the theoretical framework and the corresponding chapters².

Committing the employee to the organisation (for example by hiring him or her on a permanent contract) can overcome this issue and increase productivity.

The degree to which a job fosters the accumulation of specific skills is related to the extent to which the tasks associated with a job can only be optimally performed by an employee with experience in that specific job in that specific

² The arrows indicate a statistical relationships between independent and dependent variables, rather than causal relationships. Whether the proposed relationships are expected to be causal is discussed in more detail in the body of this dissertation. Arrows linking concepts to concepts indicate direct relationships, while arrows linking concepts to arrows indicate interactions.

company (Goldthorpe, 2000). As a newly hired employee would perform sub-optimally, replacing employees with firm-specific skills causes the employer to incur replacement costs (Williamson, 1981). Skill specificity is related to job complexity: overcoming the insecurities in inputs, outputs, and means-to-end linkages in complex jobs is most efficiently done by employees with on-the-job experience, who have developed the heuristics necessary to reduce these insecurities. Nevertheless, skill specificity is less obviously associated with job complexity than is autonomy. Highly complex jobs require on-the-job experience but not necessarily experience in the organisation: Williamson (1981) has stated as much by arguing that a surgeon, despite performing a highly complex job, can be easily transferred from one hospital to another. Because it is difficult to imagine employees in non-complex jobs developing highly specific skills, however, it appears plausible that job complexity is a necessary condition for skill specificity but not a sufficient one. At any rate, employers will be reluctant to see employees with highly firm-specific skills leave the organisation because this would hamper future productivity. Employers thus attempt to bind these employees to the organisation by employing them on a permanent contract. Although proposed to run through autonomy and skill specificity, in Chapter 3 the relationship between job complexity and employees' risk of numerical flexibility is first addressed directly (see also Figure 1.3).

The above essentially identifies job complexity as generating requirements with regard to employees' degree of autonomy and the accumulation of firm specific skills. It is, however, likely that certain employers are prepared to devote more resources to monitoring employees than others, whereas some employees may be more likely to require monitoring than others. Similarly, certain employees may be more likely than others to change work processes associated with their job, making their skills more specific, whereas some employers devote more effort to making jobs transferrable than others, for instance by periodically debriefing employees. Although transaction cost theory identifies job characteristics as ultimately responsible for transaction costs (Goldthorpe, 2000), employee and employer characteristics are thus expected to affect this relationship. Because this generates noise in the relationship between job complexity and autonomy and skill specificity, the relationships between autonomy and numerical flexibility and skill specificity and numerical flexibility are tested directly in Chapter 4. If the results of these analyses are consistent with the results from Chapter 3, this would provide additional evidence for the link between job characteristics and numerical flexibility.

Moreover, this dissertation follows Polavieja (2003) and Gebel & Giesecke (2011) by proposing that Employment Protection Legislation (EPL) affects employers' cost-benefit analyses of different types of contracts suggested by transaction cost theory. Differences in EPL between countries thus generate differences in job-based inequalities in the risk of temporary employment across countries. The main proposition is adapted from labour market economics:

employers hire an employee on a numerically flexible contract when the benefits of doing so, after subtracting the costs of doing so, exceed the benefits of hiring the employee on a permanent basis after subtracting the costs of a permanent contract. The previous paragraphs held that this cost-benefit analysis was only sensitive to variations in autonomy and skill specificity. However, when moving between institutional environments, differences in the protection of permanent employment (EPLp) and the protection of temporary employment (EPLt) affect the cost-benefit implications of a job's requirements with regard to autonomy and skill specificity. Specifically, as the relative regulation of temporary employment decreases, the procedural costs of a temporary contract decrease whereas the productivity benefits of a permanent contract increase. Because the procedural cost considerations of a temporary contract are dominant at low levels of job autonomy and skill specificity, decreasing regulation of temporary employment (relative to permanent employment) increases the probability that employees in low- autonomy and low skill specificity jobs are hired on a temporary contract. Conversely, productivity considerations are dominant at high levels of job autonomy and skill specificity, which increases the probability that employees in high autonomy and high skill specificity jobs are hired on a permanent contract when the regulation of temporary employment decreases relative to permanent employment. These propositions are shown in Figure 1.3 and assessed in Chapter 4.

1.4.2. Employers' HRM attitudes and numerical flexibility

Although employers' cost-benefit analyses related to job characteristics and EPL may explain part of the observed variation in numerical flexibility, additional explanations should be explored. To address research question 2, organisational theories of psychological contracts and managerial ideology are used to generate propositions regarding the relationship between employers' HRM attitudes and their use of numerical flexibility. Psychological contract theory proposes that employers elicit effort from employees either by explicitly investing in the employment relationship to elicit reciprocal behaviour from the employee or by signalling an on-going commitment to the employment relationship to elicit continuously high effort from the employee (Rousseau, 1989). The latter is referred to as "a psychological contract" between employer and employee. Psychological contract theory implies that, in many cases, an employer's approach to employment relations is subject to what employers consider a "better" HRM strategy. These considerations may result from how employers perceive the relationship between management and employees: are these groups essentially working towards the same goals (a unitarist view), or do they have fundamentally diverging interests (a pluralist view) (Geare, Edgar, & McAndrew, 2009)? Employers with a unitarist view expectedly prefer psychological contracts and have a stakeholder view of their employees. This is associated with an emphasis

on practices such as consultation and communication with employees (Geare, Edgar, & McAndrew, 2009) and, expectedly, with the use of permanent contracts. Employers with a pluralist view, by contrast, are expected to have a more instrumental view of their employees and are less inclined to use psychological contracts. This is associated with less emphasis on consultation and communication with employees, and expectedly, greater emphasis on the use of numerical flexibility. These proposed relationships are shown in Figure 1.3 and addressed in Chapter 5.

1.4.3. Precarious employment: employment- and financial insecurity

Employees are defined as precarious when employed on a numerically flexible contract with a high risk of unemployment, low earnings, and low unemployment benefit entitlements (see Chapter 2). To address question 3, in Chapter 4 the relationship between numerical flexibility and the risk of unemployment is assessed, together with the influence of EPL on this relationship, while Chapter 6 addresses the earnings of numerically flexible employees.

To provide an account of the risks numerically flexible employees face with regard to future numerical flexibility and unemployment in Chapter 4, transaction cost theory is integrated with dual-labour market theory (Piore & Sabel, 1984). Dual labour-market theory proposes that job characteristics are the predominant instrument for the separation of the labour market's core from its periphery (Piore & Sabel, 1984), which resonates with the job-level propositions put forward by transaction cost theory. Employers make low-transaction cost employees numerically flexible, and thus part of the periphery of the labour market, while high-transaction costs employees are hired on permanent contracts, and thus made part of the core (see the discussion in 1.4.1). The higher dismissal costs of permanent employees relative to those of numerically flexible employees then add to the replacement costs of core employees, which decreases turnover in the core. As a result, type-of-contract segmentation becomes reinforced and employment in the periphery becomes a predictor of future employment in the periphery, and for unemployment. The relative deregulation of temporary employment compared to permanent employment has been argued to increase inequalities in the risk of numerical flexibility with respect to transaction costs. Because these inequalities form the basis for type-of-contract segmentation, it is expected that the relative deregulation of temporary employment increases the degree to which numerical flexibility is a predictor of future numerical flexibility and unemployment. Numerically flexible employees are thus expected to face a high risk of future numerical flexibility and unemployment, referred to as a "trapping effect" (Booth, Francesconi, & Frank, 2002), which increases in strength with an increasing relative deregulation of temporary employment.

Chapter 6 focuses on the earnings of temporary employees relative to those of permanent employees. Thereby, claims are made regarding temporary employees' risk of low earnings. Regarding precarious employment, the focus is on the differences in raw annual and hourly earnings because these most obviously determine an employee's ability to maintain a minimum standard of decent living (Rodgers & Rodgers, 1989). Consequently, these analyses do not account for compositional differences between the groups of temporary and permanent employees. Because transaction cost theory proposes that temporary employees perform jobs that require low skill specificity and low autonomy and because these job characteristics are expectedly associated with low earnings, temporary employees' earnings are expected to be lower than those of permanent employees (Figure 1.1 indicates that this is likely the case). A lower average level of education is likewise expected to contribute to lower earnings for temporary employees. Moreover, differences in age, working hours and sector of employment likely contribute to the negative raw differentials for temporary employees.

To obtain an account of how employers reward temporary and permanent employees, true earnings differentials are also assessed: these analyses attempt to fully account for unobserved heterogeneity between individuals to assess the degree to which temporary employees' compensation differs from that of comparable permanent employees in comparable jobs (Davia & Hernanz, 2004). Here, theory offers mixed propositions. Economic theories of compensating differentials would predict that the increased risk faced by temporary employees generates higher earnings than permanent employees (Rosen, 1974). Theories on power in the workplace, however, propose lower earnings for temporary employees (Lindbeck & Snower, 1988; Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve, 2011). Because the evidence generally favours the latter, Chapter 6 proposes that the true earnings differentials between temporary and permanent employees are negative.

Because minimum wage legislation and the structure of collective wage bargaining influence the raw earnings distribution, the expectation is that they also influence the raw earnings differentials between temporary and permanent employees. Minimum wage legislation has been argued to have a positive effect on hourly wages at the bottom of the earnings distribution but a negative effect on annual earnings through a decreased demand for labour (Neumark, Schweitzer, & Wascher, 2004). While both propositions are assessed in Chapter 6, a decrease in annual earnings is most relevant to the risk of precarious employment. Additionally, both the degree of coordination in collective bargaining and the degree to which collective wage agreements are extended to cover workers other than those who participated in the bargaining process are expected to be related to the earnings differentials of temporary employees. An increasing level of coordination in wage setting increasingly standardises wages throughout the labour market, which should lead to a compression of the raw

earnings distribution and result in the relative absence of extremely high and extremely low earners (Kahn, 2000). This should decrease earnings differentials between temporary and permanent employees. However, temporary employees may be overrepresented in the proportion of the labour market not covered by collective agreements (Goslinga & Sverke, 2003), which may render the results of collective agreements irrelevant regardless of the level of coordination in the process by which they were derived. The extension of collective agreements to workers not involved in the bargaining process counters this effect and should decrease earnings differentials by making coverage independent of contract type.

An increased risk of unemployment, which numerically flexible employees are expected to suffer, could be compensated by generous unemployment benefit entitlements. Because many countries have rules and regulations that make the level of unemployment benefits conditional on earnings prior to unemployment and numerically flexible employees were argued to be at risk of low earnings, they are likely also at risk of low unemployment benefits. Additionally, when rules and regulations make the duration of unemployment benefits conditional on the duration of contribution, the high unemployment risks numerically flexible employees were argued to face should contribute to a shorter duration of unemployment benefits (Leschke, 2006), increasing these employees' risk of precariousness.

1.4.4. Implications of the framework

By exploring the proposed theoretical framework, this dissertation offers insights into employers' use of numerical flexibility. The contribution is twofold. First, it illuminates why employers may use numerical flexibility and the jobs for which they are most likely to hire a numerically flexible employee. Second, studying the influence of job characteristics on numerical flexibility provides suggestions for how numerical flexibility relates to the risk of unemployment, the risk of low earnings, and the risk of low unemployment benefits. The theoretical framework discussed above proposes that the job characteristics associated with an increased risk of numerical flexibility exacerbate the risks with regard to the other dimensions of precarious employment. This provides credibility to the frequent claims that the increasing prevalence of numerically flexible contracts in recent decades has exacerbated employees' risk of precarious employment. In this sense, the framework offers a bleak picture by arguing that precarious employment is related to job characteristics that are beyond policy makers' control. By arguing that a host of institutions affect various links between the dimensions of precarious employment, however, the framework proposes approaches for mitigating the risks generated by job characteristics.

1.5 Methodology

1.5.1 Data and analysis

This dissertation applies quantitative methods to test the propositions advanced in the theoretical framework. The specific indicators necessary to study the propositions naturally imply requirements regarding the data sources that can be utilised, as does the level at which the propositions apply. This section discusses and justifies the data sources considered, in the order in which they appear in this dissertation. The data and methodology are discussed in greater detail in the relevant chapters.

The Organisatie voor Strategisch Arbeidsmarktonderzoek Arbeidsaanbodpanel. To properly assess precarious employment and test the validity of its conceptualisation in Chapter 2, the Dutch “Organisatie voor Strategisch Arbeidsmarktonderzoek (OSA) Arbeidsaanbodpanel” was used (in English the “Organisation for Strategic Labour-market research labour-supply panel”). This dataset is referred to as the OSA-panel. The OSA-panel was first administered in 1985, followed by a round in 1986 and every two years thereafter, up to the, at the time of writing, most recent round in 2008. Data are collected from an annual representative sample of approximately 4500 individuals in approximately 2000 households. These data are used because they are longitudinal, which enables the operationalisation of unemployment risk, and because they only cover the Dutch labour market, which facilitates the operationalisation of the unemployment benefit entitlement dimension of precarious employment. These data are analysed using panel regression with random effects, which accounts for the clustering of the error terms at the individual level.

Arbeidsvoorwaardenonderzoek. To test the relationship between job complexity and the risk of numerical flexibility (Chapter 3), the “Arbeidsvoorwaardenonderzoek (AVO, Employment Conditions Study)” from the Dutch Labour Inspectorate is used. AVO is a repeated cross-sectional study, with each cross-section containing two waves of observations at the employer level. AVO was published in 2003, 2005 and 2007: the 2003 round contains a cross-section of companies and employees surveyed in October 2001 (wave 1) and again in 2002 (wave 2), the 2005 round contains a cross-section of companies and employees surveyed in October 2003 (wave 1) and 2004 (wave 2), and the 2007 round contains a cross-section of companies and employees surveyed in October 2005 (wave 1) and 2006 (wave 2). To collect the data for each round, a stratified sample of companies employing one or more employees was constructed. A sample of employees was drawn from the sampled companies to include employees remaining with the company for both waves or leaving or entering the company between wave 1 and wave 2. AVO contains data on the nature of the tasks associated with specific jobs and dynamic data at the employer level, which

makes the AVO data uniquely suited to testing the propositions advanced in Chapter 3. These data are analysed using three-level logit models, with individuals nested in companies, nested in sectors of economic activity. The fact that AVO does not contain international data could be considered a disadvantage. However, between-country differences in transaction cost mechanisms are addressed in Chapter 4.

The European Social Survey. The influence of the deregulation of temporary employment (relative to permanent employment) on transaction cost mechanisms (Chapter 4) is assessed 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). Using a mixed-mode approach to data collection, The European Social Survey measures the attitudes, beliefs and behaviour of respondents in 30 European countries, with the module on Family, Work and Wellbeing focussing specifically on these issues as they pertain to work, family and work-life balance. The ESS randomly samples respondents aged 15 and over within the included countries to allow for within- and between-country comparisons of effects. The ESS data from the module on family, work and wellbeing contain valid indicators on autonomy and skill specificity for individuals in different countries. This makes the ESS uniquely suited to testing the influence of institutional characteristics on micro-level transaction cost mechanisms. The data are analysed using two-level logit models, with individuals nested in countries.

The European Company Survey. The relationship between employers’ HRM attitudes and their use of numerical flexibility (Chapter 5) is assessed using data from the European Company Survey 2009, as published by Eurofound (Eurofound, 2008). The ECS surveys senior personnel managers and employee representatives from a sample of establishments in 30 European countries, which was collected using a stratified random design with oversampling of manufacturing industries. Managers were interviewed via telephone and asked a number of background questions regarding the organisation, before –amongst other topics- addressing issues concerning the economic situation of the company, as well as the company’s policy regarding contract flexibility and attitude regarding social dialogue and consultation with employees. After the management interview, the manager was asked whether an employee representative was available for an additional interview. Employee representatives were asked questions pertaining to management, the company’s consultation practices, employee representatives’ influence in decision making and the resources made available by the company to facilitate the function of employee representatives. The European Company Survey is one of the few available datasets containing attitude data from interviews with managers and is therefore well suited to analysing employers’ preferences. Because Chapter 5 does not focus on institutions, the multi-country structure only serves to provide

additional observations. The data are analysed using three-level logit models with employer and employee representatives nested in countries.

European Union Statistics on Income and Living Conditions. The relationships between numerical flexibility and the remaining dimensions of precarious employment are analysed using data from the European Union Statistics on Income and Living Conditions (EU-SILC). EU-SILC is a longitudinal dataset covering the 2004 – 2009 period, with coverage of the 25 EU member states plus Norway and Iceland. Due to the rotating panel design, the study tracks individuals over a maximum of four years and covers themes such as individuals' social economic backgrounds, careers, and general health and wellbeing. The primary advantages of the EU-SILC data are the encompassing nature of the income data and the longitudinal structure. This allows researchers to test the state dependency of contract type and to apply individual fixed effects, thereby controlling for unobserved heterogeneity. Additionally, the multi-country structure of the data provides explanatory power for questions regarding the influence of institutions. To examine the relationships between numerical flexibility and earnings and numerical flexibility and unemployment benefits (Chapter 6), the EU-SILC data are analysed using panel regression to account for the longitudinal structure of the data, with and without fixed effects. To assess the relationship between numerical flexibility and unemployment risk (Chapter 4), multilevel logit models are used, which are specified to account for the clustering of errors at the individual level.

1.5.2 A note on measuring numerical flexibility

As indicated in section 1.2, numerical flexibility refers to types of nonstandard employment that allow the employer to 1) vary employees' working hours on short notice or 2) dismiss them at comparatively low cost. This can be achieved, among other approaches, through fixed-term (i.e., temporary) contracts, flexitime, agency employment, freelance employment, etc. Because surveys generally record these subcategories, there are as many indicators for numerical flexibility as there are ways in which employers can achieve it. The approach applied to measure numerical flexibility in this dissertation was conditional on the data. The OSA data record whether an employee has a permanent, a temporary, or an "other" contract, and hence this is the primary measure of numerical flexibility in Chapter 2. The AVO data record both temporary employment and flexitime, and hence these are both analysed in Chapter 3. Both the ESS and EU-SILC only indicate whether an employee was employed on a temporary contract, and hence Chapters 4 and 6 exclusively focus on this dependent variable as an indicator of numerical flexibility. The ECS provides data on freelance employment, flexitime, temporary employment and agency employment, and hence Chapter 5

relies on these indicators of numerical flexibility, albeit by summarising them in a scale.

This variation in indicators of numerical flexibility can be expected to affect the results. As Chapter 3 demonstrates, flexitime is quite sensitive to volatility in the company's output market, whereas temporary employment is relatively unaffected by it. Moreover, temporary and freelance employment are related to project-based work, whereas agency employment is related to incidental variations in desired output in the manufacturing sector. Adding proper control variables to the models, e.g., sector of economic activity, accounts for these differences to some extent. Additionally, all chapters contain data on temporary employment, which is the dominant source of numerical flexibility used by employers (see Chapter 5), further adding to the reliability and relevance of the claims made in this dissertation. Moreover, the results for other forms of numerical flexibility generally reflect the results obtained for temporary employment. This provides confidence that numerical flexibility, as grouping a variety of contract types, is a reliable concept when transaction cost mechanisms and the relationship between numerical flexibility and precarious employment are considered.

1.5.3 A note on causality

Ultimately, it would be preferable to identify the causal influences on employers' use of and employees' risk of numerical flexibility and precarious employment. The lack of longitudinal data on many of the issues considered in this dissertation means that modelling causal relationships using individual fixed effects, difference-in-difference or regression discontinuity is generally not feasible. Therefore, this dissertation aims to provide a small building block in a plausible account of causality, through outlining theoretical mechanisms and identifying these mechanisms through cross-sectional multi-level models that control for the covariates deemed relevant. Naturally, this leaves a number of selection effects unaccounted for, most notably the selection effect caused by unobserved employee ability. This issue is specifically relevant in Chapters 3 and 4, since the exploratory Chapter 5 does not make causal claims and Chapter 6 has more methodological leverage over the issue of causality. In Chapters 3 and 4, employees with high ability may select into high complexity jobs and through their value for the company may earn themselves a permanent contract. The models would identify this as a relation between job complexity (or skill specificity and autonomy) and the risk of numerical flexibility, while this would in fact be the result of the spurious relation with ability.

Although this and other spurious effects cannot be eliminated altogether, some measures are taken to remove some prominent sources of endogeneity and to give future researchers more leverage over the issue of causality. First and

specifically with regard to the ability issue, the models in Chapters 3 and 4 contain variables on educational attainment and occupation. Since individuals with high ability are expected to select themselves into high education and occupations, some of the influence of ability on the relation between the job and the contract is through these variables. Second and more generally, the theoretical mechanism informing Chapters 3 and 4 relies on employers making cost-benefit analyses in the face of transaction costs, which drive their use of numerical flexibility. If the results in Chapter 3 indeed support this mechanism, the cost-benefit analysis assumption informing the theorised causal mechanism generates expectations for the influence of other variables: if employers indeed weigh the cost and benefits of specific arrangements they should be sensitive to other factors influencing the costs or benefits of these arrangements. By identifying one such factor in Chapter 4, namely, the relative protection of temporary and permanent contracts, and showing the expected influence on the mechanism, the proposed mechanism is made plausible. By taking a theoretical mechanism-based approach to causality rather than a purely methodological approach, this dissertation aims to be a building block in a mechanism-based theory of action as advocated by Coleman (1986). To make causality plausible, future researchers may add to this study by further scrutinising the mechanisms and by obtaining more methodological leverage over the issue of causality.

1.6 Overview of book chapters

This dissertation consists of five empirical chapters. Although each chapter can be considered in isolation, they are structured to provide insights into the relationship between numerical flexibility and precarious employment first (Chapter 2), followed by research into the job-based and institutional predictors of numerical flexibility (Chapters 3 and 4), followed by an analysis of the link between employers' HRM attitudes and numerical flexibility (Chapter 5), and finally an analysis of the link between numerical flexibility and precarious employment (Chapter 6). In this section, a brief outline is provided regarding the main research question, theories, and results of each chapter.

Because the aim of this dissertation is to provide an analysis of both numerical flexibility and precarious employment, **Chapter 2** is intended to demonstrate how these concepts are related. This chapter discusses past literature on precarious employment and isolates the main dimensions of the concept. From this discussion, two indicators of precarious employment are proposed and tested using Dutch labour market data. The data source is the Dutch "Organisatie voor Strategisch Arbeidsmarktonderzoek (OSA) Arbeidsaanbodpanel". The proposed indicators are deemed externally valid, and the results are robust to small changes in how the indicators are constructed. The concept of precarious employment, defined by low wages, a numerically flexible

contract, a high risk of unemployment, low unemployment benefits and a low household income, informs much of the structure of the dissertation.

Chapter 3 is the first of two chapters that assess the job characteristics related to numerical flexibility. The chapter proposes that as jobs become increasingly complex with respect to the required tasks, the employee is less likely to be hired on a flexible or temporary contract and more likely to be incorporated into the organisational hierarchy. Moreover, it hypothesises that this effect intensifies when market volatility increases. The chapter uses data from the “Arbeidsvoorwaardenonderzoek (AVO)”. Compared to employees in less complex jobs, employees in more complex jobs are less likely to be hired on a numerically flexible contract, and when they are, they are more likely to be incorporated into the organisational hierarchy later. The negative effect of job complexity on numerical flexibility is stronger in more volatile environments, especially where flexitime is concerned. These results support the transaction cost framework underlying the propositions.

Chapter 4 expands on Chapter 3 by assessing how autonomy and skill specificity, measured directly, are related to numerical flexibility. Additionally, Chapter 4 assesses how the relative deregulation of temporary employment influences the relationship between numerical flexibility and skill specificity and autonomy. The European Social Survey (ESS) is used to test these propositions. Defined by the interaction between Employment Protection Legislation concerning permanent employment (EPLp) and Employment Protection Legislation concerning temporary employment (EPLt), the relative deregulation of temporary employment increases the strength of the relation between skill specificity and numerical flexibility mechanism, but not of the relation between autonomy and numerical flexibility. Additionally, using EU-SILC, Chapter 4 shows that temporary employees are at an increased risk of future temporary employment and unemployment.

Because Chapters 3 and 4 offer explanations for numerical flexibility that are largely exogenous to the employer, **Chapter 5** attempts to go beyond these explanation by providing an account of the relationship between numerical flexibility and employers’ HRM attitudes. Based on theories of psychological contracts and managerial ideology, it is proposed that employers who consult and communicate with their employees are less likely to use numerical flexibility. The European Company Survey 2009 is used to test these hypotheses. Using multilevel regression with employers nested in sectors, nested in countries, the consultation indicators are relatively consistently related to numerical flexibility in the expected direction, but indicators for communication are not.

Having offered an extensive account of numerical flexibility, the extent to which numerical flexibility is likely to entail precarious employment, and under what circumstances, remains to be assessed. **Chapter 6** assesses earnings

inequalities between temporary employees and employees on open-ended contracts and to what extent institutions mediate earnings inequalities between these groups. Based on known characteristics of the group of temporary employees, it is hypothesised that temporary employees have lower raw earnings than employees on open-ended contracts, i.e., without controlling for heterogeneity between the groups. Additionally, it is hypothesised that temporary employees are rewarded less than comparable permanent employees, for comparable jobs. Using EU-SILC, multilevel models with country and wave dummies demonstrate the former, whereas fixed effects models demonstrate the latter. Strikingly, predicted gross annual earnings for temporary employees indicate that, in many countries, a considerable proportion of the group of temporary employees is at risk of earnings of less than 60% of the median. Based on their presumed effect on the earnings distribution, coordination in collective bargaining and the extension of collective agreements are expected to decrease these inequalities. This is only observed for the extension of collective agreements. Moreover, minimum wage levels are expected to decrease inequalities in hourly earnings but increase inequalities in annual earnings as a result of negative effects on hours and months worked for temporary employees. The former proposition is supported, but the latter is not. Finally, it is argued and shown that temporary employees' low earnings translate into low unemployment benefits, with an added negative effect of their fragmented employment history in countries where the duration of entitlements is conditioned on the period of contribution.

In **Chapter 7**, the main results of this dissertation are summarized. Additionally, the theoretical implications are discussed, and recommendations for future research and policy are given.

Chapter 2

Measuring precarious employment

2.1. Introduction³

Claims regarding precarious employment are often based on different and imprecise definitions and often quantitatively assessed with either proxies or *ad hoc* indicators. Though Kalleberg's 2011⁴ study is seminal, it is argued that these are some of the main shortcomings in this particular work. Although Kalleberg's thesis is well argued and eloquently explained, his empirical results seem *ad hoc*. His argument relies, at times, on the growth of non-standard employment relations as evidence for rising employment precariousness and, at other times, on decreased tenure, increased involuntary job-loss, increased long term unemployment, weakened internal labour markets and increased perceived employment insecurity. Consequently, the concept of precarious employment remains elusive. It is argued that many studies on precarious employment suffer similar shortcomings, which hinder inter-study comparisons and render findings ambiguous. *How could precarious employment be measured to be consistent with theory to ensure reliable and valid results?*

Since the main focus of this dissertation is on the factors that interplay to create precarious employment for employees, this chapter aims to construct a reliable and valid indicator for measuring precarious employment. It critiques Kalleberg's (2009, 2011) empirics and proposes an improved method for measuring precarious employment. First, precarious employment is conceptualised based on a review of relevant theoretical perspectives. Additionally, existing approaches for measuring precarious employment are discussed. Second, building on the theoretical discussion, two indicators are proposed and integrated. Finally, using Dutch labour market data, the indicators are tested against several hypotheses, and the results are discussed. The main value of the proposed conceptualization of is the fact that it moves beyond numerical flexibility as an indicator for precarious employment, and defines precarious employment on the level of the employee.

³ A version of this chapter has been published as: Olsthoorn, M. (2013). Measuring precarious employment: a proposal for two indicators of precarious employment based on set-theory and tested with Dutch labour market data. *Social Indicators Research*, 119, 421 - 441.

⁴ See: Kalleberg, A. (2011). *Good Jobs, Bad Jobs: The Rise of Polarized and Precarious Employment in the United States, 1970s to 2000s*. New York: Russel Sage Foundation.

2.2. Precarious employment in academic discourse

2.2.1. *Precarious employment as threatening insecurity*

Based on the adjective “precarious”, “precarious employment” refers to a state of threatening insecurity. This assertion resonates with the use of “precarious” in everyday language (Webster 2011) and with the use of “precariousness” and “precarity” in academic discourse since their early use by Pierre Bourdieu in 1963 and Agnes Pitrou in 1978 (Barbier 2004; Waite 2009). At that time, the concept referred to threatening insecurity caused by employment characteristics but also, for example, an insecure housing situation and the risk of poverty (Waite 2009). The early work by Bourdieu being an exception, precariousness of employment became an object of research only in the late 1980’s, when Schnapper & Villac (1989) distinguished between employees with status and employees without status, with the latter having limited entitlements. At the same time, Rodgers & Rodgers (1989) defined precarious employment as a situation in which, among other characteristics, employment does not provide employees with the security of a minimum standard of decent living. This definition reflects the threat that the use of the adjective “precarious” implies. Most scholarly work since then, including Kalleberg’s (2009, 2011), has defined precarious employment as referring to a state of threatening insecurity or risk.

However, there remains an ambiguity regarding what constitutes insecurity when employment is precarious. The insecurity implicit in precarious employment might refer to (1) the insecurity of the ability to secure a sufficient income. This insecurity is central to early literature on precarious employment that linked precarious employment to poverty and deprivation (outlined in: Barbier 2004) and remains implicit in Vosko (2006). However, insecurity might refer to (2) the insecurity of whether an individual will be dismissed from their job, i.e., defining insecurity as the risk of job-loss (Böckerman, 2004; Clark & Postel-Vinay, 2009). This precariousness-as-job-insecurity is implicit in Kalleberg (2009, 2011) and has strong interrelations with the use of non-standard employment contracts as indicators for precarious employment (see for instance: Quinlan, Mayhew & Bohle 2001) because non-standard contracts might be used to proxy the chance of dismissal. Therefore, central to (1) is the question: “Is the employee able to obtain a secure income with which to support a decent standard of living?” In contrast, central to (2) is the question: “Is it likely that the employee’s job will end in the near future and does that create a risk for the employee?” The two types of insecurity are related, as noted by Rodgers & Rodgers (1989). The proposition set forth here is to integrate these strands of literature to obtain a proper notion of precarious employment as threatening insecurity.

Threatening insecurity, caused by characteristics of the employment relation, is thus central to the concept of precarious employment. Consequently, precarious employment should not only be defined in terms of characteristics of

the contract (e.g., by Leschke & Keune 2008) and requires instead a broader conceptualisation of the employment relation, such as that offered by Kalleberg: "... [employment relations] explicitly link individual workers to their workplaces and other institutions wherein work is structured (Kalleberg 2011 p. 83)". Without yet detailing the dimensions of precarious employment, it is proposed that threatening insecurity in employment exists when employees with (1) few means to support themselves beyond the wage they earn (2) are employed on a contract that provides a low wage and little security, and (3) offers limited access to entitlements that provide income security (see also: Kalleberg 2011; Rodgers & Rodgers 1989; Vosko 2006). Precarious employment is thus implicitly defined as the overlap of contract insecurity and insecurity regarding income sufficiency. Because 1 through 3 are essentially contract-, employee-, and institutional-level elements, precarious employment constitutes a subset of characteristic on these levels. Precarious employment exists when vulnerable individuals (employee level) are employed on insecure contracts (contract level) with unsupportive entitlements (institutional level). Insecure contracts refer to elements related to the employment contract that may make employment precarious. Vulnerable employees are workers who can be expected to suffer strongly from the conditions that insecure contracts offer because of their personal situations (see also: Vosko 2002). Unsupportive entitlements include an institutional element and are characterised by limited rights that employees may derive from their employment relation (ER), notably in relation to income security (see also: Kalleberg 2009). The discussed elements indeed define precarious employment as a subset, as shown in Figure 2.1.

Precarious employment is thus conceptualised as a characteristic of the employment relation, i.e., as vulnerable employees employed on insecure contracts, who can expect few entitlements to income support when unemployed. This conceptualisation resonates with Vosko's (2006) conceptualisation, which includes a variety of dimensions on the micro-, meso- and macro-levels. With regard to terminology, precarious employment refers to employment relations that are precarious for the employee, while precarious employees and "the precariously employed" refer to employees in an employment relation that is precarious for them.

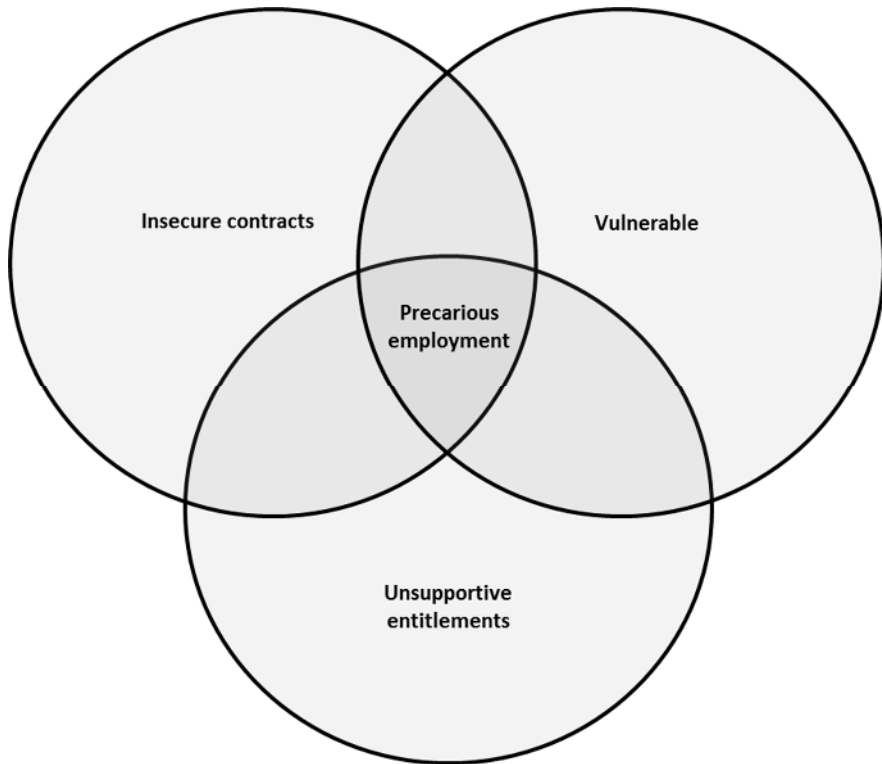


Figure 2.1: Precarious employment as the linking of vulnerable workers to insecure contracts and unsupportive ER entitlements. Vulnerable employees in fragile jobs, with unsupportive ER entitlements, are deemed precariously employed.

This implies a focus on the level of the individual employee, because the employee represents the level at which the threat of precariousness is experienced. This focus excludes individuals in the labour force who are unemployed. The remainder of this chapter focuses on employees and the self-employed, and considers relevant characteristics at the employee level, the level of the contract, and the level of the institutional environment.

2.2.2. Current indicators

The preferred indicator for precarious employment has overwhelmingly been whether an individual is employed on a non-standard contract. Underlying this indicator is the assumption that non-standard contracts are flexible and thus insecure, which has defined precarious employment in recent research (Quinlan, Mayhew, & Bohle 2001). Here, the decline of “typical” employment relations in favour of an increasing number of “atypical” employment relations is generally interpreted as indicating rising employment precariousness (Barbier 2004;

Cranford, Vosko, & Zuckewich 2003; Dörre, Kraemer, & Speidel 2006; Quinlan, Mayhew, & Bohle 2001; Vosko 2006). Kalleberg (2011) likewise uses data on non-standard employment from the US Department of Labour to make the case for growing employment precariousness. Similarly, Quinlan, Mayhew & Bohle (2001) focus predominantly on non-standard working arrangements (temporary work, part-time work, outsourcing) when assessing the effects of precarious employment on occupational health and safety. This chapter aims to move beyond non-standard contracts as a single indicator for precarious employment. Conceptually, it is argued that focusing exclusively on non-standard employment fails to capture the notion of “threatening insecurity” implicit in precarious employment: a contract may be easily dissolved by the employer, but a high wage and/or generous unemployment benefits may make that insecurity less threatening (Böckerman 2004; Clark & Postel-Vinay 2009). Without incorporating elements that indicate the severity of dismissal, rather than just the chance of it, contract insecurity is poorly measured and the threat of it neglected (see: Greenhalgh & Rosenblatt 1984). This broader conceptualisation is upheld by authors such as Leschke & Keune (2008), Rodgers & Rodgers (1989), and Vosko (2006).

Many authors incorporate wage levels, employer-provided benefits, labour market characteristics and institutional characteristics to deepen their analysis. In using factors in addition to non-standard employment arrangements to define precarious employment, Vosko’s (2006) conceptualisation is exceptionally rich (see Vosko, 2006 for elaboration). Kalleberg (2011) also uses additional indicators to strengthen his case: the declining attachment to employers, the weakening of internal labour markets, increasing rates of involuntary job-loss, the spread of long-term unemployment, the increase in perceived contract insecurity and the shifting of risks from employers to employees. Though these indicators are valuable additions to indicators solely based on non-standard contracts, they fail to account for the situation of the employee occupying a potentially precarious job. The relevance of this factor is indicated by studies that show some employees are in non-standard work by choice, whereas others are not (Clark 2005; Kalleberg 2008; Loughlin & Murray 2013). When employees are in otherwise precarious employment by choice, the label “precarious” seems misplaced because the degree of threatening insecurity the employee experiences is likely low. This chapter focusses on not only job aspects and the regulatory environment but also characteristics of the employee. This approach is adopted to address the idea that the threat posed by a degree of insecurity can only be assessed by examining the type of employee “matched” to a potentially precarious job: a wealthy employee likely has less fear associated with losing their job than does an employee with little or no wealth. This approach has been explicitly advocated by Loughlin & Murray (2013), who support accounting for “employment status congruence” in assessing job quality, i.e., the extent to which an individual’s employment status might conflict with their personal situation.

Generally, Kalleberg (2009, 2011) relies on bivariate descriptive statistics to make his case, e.g., by showing an increase in non-standard contracts or in perceived contract insecurity. Though these are interesting findings, which indeed indicate an increase in contract insecurity among workers, they are at risk of committing ecological fallacy, which has gained much attention in epidemiology and the social sciences (Freedman 2002; Piantadosi, Byar, & Green 1988). This issue, in the context of job quality outlined more extensively by Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve (2011, pp. 68 - 69), is crucial because not integrating the dimensions on the individual level jeopardizes conclusions regarding individuals' precariousness, notably when status congruence is an issue (Loughlin & Murray, 2013). For instance, highly educated, highly employable individuals may predominantly be the individuals with non-standard contracts, whereas regularly employed individuals with little savings in declining industries may have the highest perceived contract insecurity. Both the incidence of non-standard contracts and perceived contract insecurity might then increase over time, but not necessarily for the same employees. Differently put: both may increase overtime, but these increases may be independent on the individual level. A distinctive approach is adopted by Leschke & Keune (2008), who discuss the effect of the public- private sector division on precarious employment in Germany and the United Kingdom. The authors define three dimensions of precarious employment, i.e., "low pay", "very short or long working hours", and "temporary contracts", and propose that employees are precarious if their job fulfils two of these three conditions. Although their sole use of job-based indicators was criticized in the previous section, the strength of their approach is its linking of the specific conditions of precarious employment on the individual level.

In the following sections, two indicators are proposed to reflect the two ways in which precarious employment has been conceptualised. First, the two indicators are embedded in theory to provide content validity (Gerring 2001). Second, the indicators are constructed using an approach grounded in set-theory, to maximize validity by allowing the measurement of exactly the object of interest, i.e., respondents who are precarious on the dimensions deemed relevant, thus countering the risk of ecological fallacy (Freedman, 2002). This approach resembles Leschke & Keune's (2008) approach in that the use of logical conjunction, discussed in greater detail later, allows the linking of dimensions on the individual level.

2.3. Two indicators

As stated, two broad strands of literature can be distinguished in research on precarious employment: precarious employment as insecurity regarding income sufficiency and regarding contract insecurity. In this chapter, no *a priori* choice

between the two is made; rather, two indicators are developed, one relating to the contract insecurity literature (Quinlan, Mayhew, & Bohle, 2001; Kalleberg, 2011) and another, to the “material deprivation” or “poverty” argument in earlier literature (Barbier, 2004; Rodgers & Rodgers, 1989). To broadly capture an individual’s income and whether it expectedly provides security, Indicator 1 is constructed using a wage dimension, a supplementary (household) income dimension and an unemployment benefit dimension. Indicator 1 reflects precarious-employment-as-income-insecurity and consequently links to earlier research. To capture whether an individual’s job might end in the near future and whether he/she can be expected to be employed again quickly thereafter, Indicator 2 is constructed using a numerical flexibility and an unemployment dimension. Indicator 2 reflects precarious-employment-as-contract-insecurity and links to recent research, most notably Kalleberg (2011) but also, for instance, Quinlan, Mayhew, & Bohle (2001). These indicators are integrated into one summary indicator to permit an assessment of the extent to which insecurity regarding income and insecurity regarding the contract have become increasingly linked in recent decades, and for which groups. This integrated indicator builds on the outline in Section 2.1 and most broadly reflects precarious employment as it has been conceptualised throughout the history of research into the subject. In the following sections, precarious employment is operationalised using the proposed approach and is tested against several hypotheses.

2.3.1. Indicator 1: Insecurity regarding sufficient income

In the case of precariousness as insecurity regarding sufficient income, it is proposed that an employee is precariously employed if they are precarious on three conditions: wage, supplementary income, and unemployment benefits. Here, wage is considered a contract-related dimension; supplementary income an individual dimension; and unemployment benefits an institutional dimension. These considerations follow from Figure 2.1.

First, an employee’s wage indicates the ability to avoid poverty after job-loss, as a high wage expectedly allows for higher savings, which can be used to avoid poverty when unemployed (Böckerman 2004; Clark & Postel-Vinay 2009; Pacelli, Divicienti, Maida, Morini, Poggi, & Vesan 2008). Moreover, a low wage may make an individual “working poor”, which may make them uncertain about their ability to secure a minimum standard of decent living even while employed. Second, the precarious individual is vulnerable (a notion present, for instance, in: Vosko, 2006, but less clearly in Kalleberg, 2009, 2011), a trait that is characterised in this chapter as having a low supplementary (i.e., household) income. Supplementary income relates to the issue of relative poverty, as a low supplementary income increases the difficulty of living decently when unemployed. This case is often more explicitly made for unemployment benefits

but mostly adopts the same logic (see for instance: OECD 1997). Additionally, adding the dimensions of supplementary income allows for distinguishing between truly precarious employees and secondary wage earners. The latter may be precarious on all dimensions but remain financially secure because of the primary wage earner’s income, a situation that relates to the issue of employment status congruence (Loughlin & Murray, 2013). Third, employees may be supported and withheld from poverty by a system of entitlements, most notably in this case, unemployment benefit entitlements. Unemployment benefits (hereafter: UB) improve the ability to secure a decent financial standard of living by offering a replacement income for the wage that was lost because of job loss (Pacelli, Divicienti, Maida, Morini, Poggi, & Vesan 2008).

Based on the above literature, it is argued that an employee has a precarious income if and only if they fulfil three conditions: they have (1) a low wage, (2) low supplementary income, and (3) few benefit entitlements. All three conditions should be fulfilled because otherwise it is likely that the employee is able to obtain sufficient income to avoid insecurity regarding his or her standard of living. It should be noted that designating a permanently employed individual as “precarious” diverges from much work on precarious employment, such as Kalleberg (2011) and Rodger & Rodger (1989). However, Vosko (2006) laments the distinction between permanent and precarious employment, partly because focusing on contract types obscures precariousness based on other dimensions.

2.3.2. Formalizing Indicator 1

Central to the link between the three dimensions of precarious employment and Indicator 1 is the proposition that an individual is precarious if they have (1) a low wage, (2) low supplementary means, and (3) low unemployment benefit entitlements. These three dimensions can be considered “sets”, e.g., the set of individuals earning a low wage. Defining precarious employment as thus a subset of these dimensions, Indicator 1 can be presented using Boolean operations:

$$PE_income = W \cdot S \cdot UB \quad (Eq1)$$

In Eq1, “PE_income” indicates whether an employee has a precarious income; “W” represents an individual’s position in the wage set; “S” represents supplementary income; and “UB” represents the individual’s entitled benefits, i.e., the supportiveness of their entitlements. These sets can be subdivided into a “low” and a “high” subset. For instance, the set of individuals earning a wage can be subdivided as individuals earning a low wage and individuals earning a high

wage. They can then be assigned either a 1 or a 0 value, depending on whether a respondent is in the “high” or the “low” subset. An individual’s subset is given by their monthly wage *vis à vis* a to be defined threshold. For example, a respondent with a wage below the threshold has a “low” wage and scores a 1 on W. Because the conjunction functions as a multiplication, combining the defined dimensions using the proposed logical statement causes Eq1 to assume a value of 1 for PE, if and only if W, S, and UB also assume a value of 1.

2.3.3. *Indicator 2: Insecurity regarding the contract*

In the case of precariousness as contract insecurity, it is proposed that an individual is precariously employed when they are employed on an insecure contract and have a high likelihood of being unemployed for a significant amount of time after dismissal. The main issue concerns not whether employees can sustain themselves, but insecurity regarding the contract. This is conceptualised as the likelihood of losing one’s job and the severity of the consequences of job loss, noted by Böckerman (2004), Clark & Postel-Vinay (2009) and Greenhalgh & Rosenblatt (1984).

Pivotal to the concept of contract insecurity is insecurity regarding whether the job may end in the foreseeable future. It is difficult to measure this insecurity directly, but the type of employment contract is an indicator of the ease with which an employer may terminate the employment relation. Generally, numerically flexible contracts are easier to terminate than are permanent contracts and thus may predict a higher likelihood of employer termination and by extension, to increased insecurity in this respect. Additionally, using numerically flexible contracts as an indicator for precarious employment resonates with recent literature on the subject, for instance, Kalleberg (2009) and Leschke & Keune (2008).

Important to the link between income sufficiency and the severity of job loss is the risk of unemployment following the loss of the job, with higher chance of entering unemployment for a longer period raising the probability of financial difficulties. Though linked to jobs, the risk of unemployment can be expected to be influenced by an individual’s qualifications (Hanisch 1999) and by economic cycles and labour-market demand for the individual’s specific skill or occupation (OECD 1997) and is therefore treated as an individual-level characteristic. Moreover, high employability diminishes the perceived consequences of job loss and thus, the level of contract insecurity (Böckerman 2004; Clark & Postel-Vinay 2009; Pacelli, Divicienti, Maida, Morini, Poggi, & Vesan 2008). *The above discussion makes precarious the contract of any employed individual with (1) a numerically flexible contract and (2) a high risk of unemployment.*

2.3.4. Formalizing Indicator 2

Indicator 2 is defined by the proposition that an individual is precarious if they have (1) a numerically flexible employment contract and (2) a high risk of unemployment after being dismissed. Using Boolean logics, this definition yields Eq2:

$$PE_contract = NpC \cdot Ru \quad (Eq2)$$

In Eq 2, “NpC” represents whether an individual has a permanent or a numerically flexible contract, and “Ru” represents the risk of unemployment following the severing of that numerically flexible contract. As with Eq1, a 1 value on the separate dimensions signals “precariousness” of that dimension, with Eq2 assuming that value if and only if all dimensions assume a value of 1.

2.3.5. Integrating Indicator 1 and 2

Finally, Indicators 1 and 2 can be integrated to formulate a summary indicator that fully captures precarious employment as insecurity regarding the contract and whether it can provide sufficient income (Rodgers & Rodgers, 1989). This formulation entails conjoining or multiplying Eq1 and Eq2 to yield:

$$PE_income * PE_job = (NpC \cdot W) \cdot (Ru \cdot S) \cdot (UB) \quad (Eq3)$$

In this equation, NpC*W represents the contract aspect of precarious employment; Ru*S represents the employee’s vulnerability; and UB represents the supportiveness of the individual’s unemployment benefit entitlements.

Key to determining how to measure precarious employment is the operationalisation of the dimensions and their thresholds to permit the conjunctions proposed above and eventually, to construct an indicator for precarious employment. Hereto, the Dutch OSA-panel is discussed below.

2.4. Data and operationalisation

2.4.1. *The Dutch OSA panel*

To properly assess precarious employment, it is preferable to obtain longitudinal data, which enable the operationalisation of the risk of unemployment, and the benefits entitled to when unemployed. For the Dutch labour market, longitudinal data are provided by the “Organisatie voor Strategisch Arbeidsmarktonderzoek (OSA) Arbeidsaanbodpanel”, translated in English as the “Organisation for Strategic Labour-market research labour-supply panel”. This dataset is referred to as the OSA-panel. The OSA-panel was first recorded in 1985, followed by a recording in 1986 and every two years thereafter, up to the most recent recording in 2008. This supplies the researcher with two recordings spaced 1 year apart and 11 consecutive recordings spaced 2 years apart. The data were collected using structured interviews (until the year 2004) and self-completed questionnaires (from 2004 onwards) with both employed and non-employed individuals and the members of their household aged 16 to 64 years. The questions address the areas of current employment or job-searching behaviour, past and current education, income and benefit entitlements, and work and care and are supplemented with several recall questions on labour market transitions in the two years prior to the recording. Data are collected from a representative yearly sample of approximately 4500 individuals in approximately 2000 households, with weighing required from the 2000 recording onwards because of attrition and selective non-response. The analysis was limited to individuals employed in the relevant panel year. Data on the employment contract are available only for 1992 and for 1996 through 2008; therefore, the 1986-1990 and 1994 recordings are absent from the sample.

2.4.2. *Operationalising precarious employment*

As shown in Eq1 and Eq2, an employee should be precarious on all conditions that correspond to Indicator 1 or Indicator 2. Only then does the employee score a 1 on all dimensions, and do the multiplications in Eq1, Eq2 and Eq3 yield a 1, thus indicating that the employee is in the set of the precariously employed individuals. To determine whether a respondent is in a set, a criterion for an “in or out” decision is formulated by assigning threshold values (τ) to the separate dimensions that define Indicators 1 and 2. By assessing how a respondent scores with regard to τ , an “in or out of the set” decision was made, and a corresponding 1 or 0 value was assigned to that dimension. For instance, an individual with a wage below a certain threshold τ for wage is in the set of employees with a low wage and scores a 1 on the wage dimension. In the following discussion, thresholds are proposed for all dimensions of Indicators 1 and 2.

Wage: When assessing the wage dimension of precarious employment, reported monthly wages for each wave are used, and the wage-threshold (hereafter τ_w) is represented by a percentage of the median wage of employed respondents in the sample. First, operationalising τ_w as a percentage of the median wage is theoretically meaningful, since it relates to a concept of relative poverty and thus adheres to the conceptualisation of precarious employment as the inability to secure a sufficient income (Rodgers & Rodgers 1989). Second, this threshold makes scores across the panels comparable by constructing an indicator of purchasing power parities per panel year. A τ_w of 60% of the median wage is adopted, which corresponds to the frequently used measures for relative poverty (see also: Leschke, Watt, & Finn, 2008). Employees earning a wage below 60% of the median wage earn a low wage and score a 1 on W.

Contract: In 1992 and from 1996 through 2008, respondents in OSA were asked to specify their employment contract type. Possible answers were “a permanent contract”, “a temporary contract that will likely be followed by a permanent contract”, “a temporary contract that will not likely be followed by a permanent contract”, and “other”. It is proposed that an individual is precarious on this dimension if they have a numerically flexible contract, which is indicated by them having a temporary contract here. An individual scores a 0 on this dimension if they have a permanent contract and a 1 if they have a temporary contract.

Supplementary income: Supplementary income does not follow from a straightforward survey question in OSA, as monthly wages do, but is constructed using cumulative wages earned by other household members and is adjusted for household needs using the OECD methodology⁵. τ_s is set at 60% of the median wage in the appropriate panel. Individuals with a supplementary income below 60% of the median wage thus have low supplementary income and score a 1.

Unemployment risk: The risk of unemployment is defined as the length of unemployment following the severing of the contract measured with the contract indicator (with a potential length of zero months indicating no unemployment and thus zero risk). The threshold τ_{Ru} is 6 months, which corresponds to an entitlement of the Dutch minimum period of UB in the observed period. Individuals unemployed for more than 6 months after ending their tenure were thus considered “having a high unemployment risk” and were assigned a 1-value on that dimension. It should be noted that the scores on Ru in wave x are constructed using recall questions in wave $x+1$. Consequently, the last recording (2008) is excluded by default.

⁵ For a discussion methodology and a comparison of different methods for calculating household needs, see Duclos & Mercader-Prats (2005).

Unemployment benefits: For an indicator for UB entitlement that could be used for income support in the case of future unemployment, the scores are constructed using data on the respondent's recent employment history⁶. This method yields the number of months for which entitlements can be claimed, which follows from calculations informed by the specifics of the Dutch "Werkloosheidswet"⁷. For the threshold for precarious duration, 6 months are considered the τ_{ub} , similar to unemployment. Following the logic presented when discussing the wage and supplementary means dimension, it might be expected that the amount of monthly benefits to which an individual is entitled should be accounted for when operationalising the UB dimension. However, in the Netherlands, monthly entitlements are calculated as a percentage of earned wages. As this percentage is by definition less than 100%, a precarious wage would *ipso facto* signify a precarious amount of monthly UB entitlements, thus making the latter an unnecessary addition.

Values for the indicators of precarious employment that follow from Eq1, Eq2 and Eq3 are calculated for each individual employed in the relevant panel. *For Indicator 1, this calculation corresponds to τ_w and τ_s equaling 60% of the median wage and a τ_{ub} of 6 months. For Indicator 2, this calculation corresponds to τ_{npc} being dichotomous and by whether the employee has a numerically flexible contract, with τ_{tu} equaling 6 months.* Additionally, the integrated indicator, given by Eq3, comprises all dimensions discussed. In the following section, several hypotheses regarding precarious employment are formulated and tested with the proposed indicators.

2.5. Precarious employment in the Dutch labour market

The proposed indicators were evaluated by testing four hypotheses concerning precarious employment. The main source of hypotheses is Kalleberg (2011). The hypotheses are straightforward and thus only briefly discussed, as the main goal of the hypothesis-testing is to evaluate the proposed indicators, rather than to break new theoretical ground. For a more in-depth theoretical discussion on the presented hypotheses, references are supplied. Before presenting the

⁶ Note that the term UB entitlement refers to the amount of replacement income an individual is entitled to, should become unemployed, according to the specific regulations of entitlement build-up active in a given context. As in the Netherlands, both the amount and the period of replacement income are conditional on the duration and the remuneration of past employment, both of which variables are observable in OSA, so UB entitlements are readily calculable. The calculated period and the entitled amount do not independently indicate whether these entitlements will be claimed in the near future, i.e., in the case of unemployment.

⁷ In the observed period, the Dutch WW was divided into a basic phase and an extended phase, with the basic phase paying 70% of previous daily wages for six months, and being accessible for all employees who earned a wage for 26 out of 36 weeks prior to dismissal. The extended phase paid 70% of daily wages to employees who have worked a minimum of 4 out of 5 years prior to dismissal, with every extra year over 3 years granting an entitlement to one extra month of benefits (Pennings & Damsteeg 2009).

hypotheses, some background to the analysis is given by discussing institutions regulating the Dutch labour market. This discussion simultaneously provides a background to the analyses in Chapter 3, which are based on Dutch labour market data as well.

2.5.1. *Labour market institutions in the Netherlands*

With regard to the procedures and legislation that accompany the involuntary dismissal of an individual employee, a summary indicator published by the OECD in 2013 shows that, on a 0-6 scale (0 for least stringent, 6 for most restrictive) the Netherlands scores a 2.94 for the processes regarding the dismissal of regular employees at the time of writing (OECD, 2013). Regardless of a gradual move towards more neoliberal policy (Delsen, 2002), this is still high by international standards (the 2013 OECD average was 2.29 [OECD, 2013]). It can indeed be argued that from an employer's point of view Dutch procedures are relatively demanding, as they require an *a priori* request for a permit-to-dismiss by either the "UWV Werkbedrijf", or a rescission of the contract by a judge ("Burgerlijk Wetboek," 2006; Pool, 2006), with the UWV procedure tending to take at least four to six weeks (Pool, 2006). Moreover, when going through a judge the employer will generally pay the employee a mandatory fee, based on the age and salary of the employee and the specifics of dismissal, or in case of unfair dismissal, the employer may be forced to restore the contract ("Burgerlijk Wetboek," 2006). Moreover, Dutch law places a strong emphasis on the fact that it is indeed the employer that needs to provide *a priori* and elaborate evidence of the fairness of dismissal ("Ontslagbesluit," 1998). The grounds for fair dismissal identify economic conditions, inaptitude, and different forms of immoral behaviour as fair grounds. Moreover, the dismissal of employees for economic reasons needs to happen according to a "last-in-first-out" procedure, which would disallow cherry-picking by employers ("Burgerlijk Wetboek," 2006). The rules and regulations regarding non-standard employment can be considered more lenient in the Netherlands⁸, which is reflected in an OECD indicator of 1.17 for the protection of non-standard employment. This is comparatively low compared to the OECD average of 2.08 (OECD, 2013). Indeed, employers have quite some leeway in using non-standard employment, for instance: employees can under all circumstances be hired on temporary contracts and this contract can be renewed twice, agency employment is permitted under all but any circumstance, and temporary agency agreements can be renewed any number of times for any duration (OECD, 2013).

⁸ Measures introduced in the "Wet Werk en Zekerheid", to be introduced in 2015, imply a small increase in the protection of temporary contracts. Under the old regulations, temporary contracts could be renewed twice before a permanent contract was mandatory, unless employment was interrupted for three months. Under new regulations, only one renewal is allowed before a six month pause is required to forego offering a permanent contract. Simultaneously, new regulation decrease the protection of permanent contracts somewhat, by making dismissals less expensive for employees.

With regard to unionisation the Netherlands has the peculiar characteristic of having a relatively low density of 18,9%, but as a result of administrative extension, has a coverage rate of 80+% of collective agreements (OECD, 2008). This structure of collective bargaining allows for very limited differentiation in wages between similar employees, but does tend to allow for- and result in differentiation in types of contract (Houwing & Schils, 2010). Codetermination in the Netherlands is arranged through the “Wet op de Ondernemingsraden”, which states that any company with 50 employees or more is required to have a works council should this be requested by employees (“Wet op de Ondernemingsraden,” 1971). A works council in the Netherlands has extensive information and consultation rights on matters such as changes in the composition and size of the workforce, the transfer of ownership of the company or the acquisition of ownership over another company, changes in location, important new investments, in or outgoing credit obligations and environmental matters. A works council in the Netherlands is entitled to information, consultation and voice in matter concerning changes in pension systems, profit-sharing, special reward systems, training, working conditions and work consultation structures (“Wet op de Ondernemingsraden,” 1971). These extensive rights require employers to work closely with works councils, and employees are generally well represented in Dutch companies.

As a result of the relatively strict rules and regulations regarding the dismissal of employees on open-ended contracts, the Dutch labour market is characterised by relatively high prevalence of forms of numerical flexibility, such as temporary and flexible contracts (Olsthoorn, 2011). Interestingly, on the sector level unions tend to deviate from regulations regarding the use of flexible employment as laid down in the “Flexwet”, by allowing employers more leeway in hiring flexibly (Houwing & Schils, 2010). These institutional characteristics should be considered when interpreting the results presented in this chapter and in Chapter 3.

2.5.2. *Hypotheses*

As stated in the introductory section to Chapter 1, it is expected that the flexibilisation of labour markets, the deceleration of economic growth, and demographic developments have caused the incidence of precarious employment to increase in recent decades (Kalleberg 2011). Kalleberg demonstrates these results for the United States. Because the Netherlands has experienced similar developments (Delsen, 2002), a similar increase in precarious employment is expected. Hence, it is proposed that:

H1: The incidence of precarious employment has increased over time.

Highly educated employees tend to have better quality jobs in terms of wages and stability than the lower educated (Bol, 2013). This results first because they are able to negotiate better conditions before accepting a position as a result of being in higher demand and lower supply. Second, they are less replaceable than the lower educated on account of skill specificity, and are more difficult to monitor, which is expected to result in more secure jobs. This issue has been discussed in the theoretical framework proposed in Chapter 1 and is addressed more in depth in Chapter 3 and 4. Finally, the scarcity of employees with high education levels makes it likely that their unemployment periods will be short. Although Kalleberg (2011) argues that even the higher educated are currently at risk of precariousness, their higher than average wages, greater job security and employability nonetheless support the expectation that they are less at risk than are the lower educated. Therefore, the risk of precarious employment decreases with an increasing level of education (Kim & Kurz 2001). Leschke & Keune (2008) indeed found empirical support for this expectation in Germany and the United Kingdom. Thus, it is proposed that:

H2: Highly educated employees have a lower probability of being precariously employed than do low-educated employees.

Qualitative research often focuses on the propensity of immigrants to be precariously employed (Ahmad 2008; Porthé et al. 2010). Because immigrants have little social capital in the host country, tend to have lower language skills compared with natives and are expectedly less educated than the latter, they are vulnerable to low quality jobs. Moreover, they tend to have a lower disposable income, a fact that exacerbates the severity of job loss and makes unemployment difficult to manage financially. Because the above discussion applies most strongly to non-Western immigrants, the incidence of precarious employment is expectedly higher among them compared with non-immigrants (Ahmad 2008; Porthé, et al. 2010). However, actual situations might be less straightforward than the presented hypothesis suggests, as Fuller & Vosko (2008) find striking differences for male and female immigrants. However, it is proposed that:

H3: Non-Western immigrants have a higher probability of being precariously employed than do non-immigrants.

Finally, differences in employment conditions tend to exist between the private and the public sectors (Kalleberg 2011). It is expected that ownership structures in the private sector and the explicit desire to generate a profit tend to lead companies to desire flexibility and thus to make jobs more insecure. Ostensibly, this issue is less relevant in the public sector. The effects of these differences may be quite profound, as they become enshrined in wage agreements and the culture of hiring and firing in the public and the private sectors. Leschke & Keune (2008) assess the difference between precarious employment in the public and private service sectors in Germany and the United

Kingdom. They observed odds ratios >1 for the effect of a private sector dummy on precarious employment in both countries, though the UK effect is borderline significant. Nevertheless, it is expected that the incidence of precarious employment is higher in the private sector than in the public sector. Hence, it is proposed that:

H4: Employees in the public sector have a lower probability of being precariously employed than do employees in the private sector.

2.5.3. Analysis and results

To assess these hypotheses, probit models are used to account for the binary nature of Indicator 1 and 2, which are the main dependent variables. Random effects models are used to account for individual-level clustering of error terms. Although fixed effects would be a stronger test of causality, the descriptive nature of the proposed hypotheses makes random effects a more appropriate test of the proposed indicators. Model 1a specifies Indicator 1 as the dependent variable, with Indicator 2 added as an independent variable in a second iteration of the model (Model 1b). Model 2a specifies Indicator 2 as the dependent variable, with Indicator 1 added as an independent variable in a second iteration (Model 2b). Finally, Model 3 conjoins Indicators 1 and 2 as the dependent variable.

In these models $\text{pr}(\text{PE_income}_{ij}=1)$ refers to the probability that individual i at time j has a precarious income, whereas $\text{pr}(\text{PE_contract}_{ij}=1)$ refers to their probability of contract precariousness. As independent variables, in all models a “time” variable, an “education” variable, a dummy for “public sector employment” and a dummy for “non-Western immigrant” are added. Additionally, a “female”-dummy and an “age” variable are added as controls. The time variable represents the panels for which Indicators 1 and 2 could be constructed (i.e., 1994 and 1996 – 2006). The education variable is an ordinal variable, with scores 1-5 representing increasing education levels in the Netherlands (1: Elementary education, 2: vmbo/lbo/mavo, 3: mbo/havo/vwo, 4: Higher vocational, 5: University). The public sector dummy represents where an employee is employed, with 1 designating the public sector and 0 the private sector. To determine public sector employment, SBI 1-digit sectors were used; healthcare, education and government were deemed public, and the remaining sectors, private. The non-Western immigrant dummy has a 1-score when employees come from non-Western countries, such as the Middle East and parts of Asia. It should be noted that Eastern European immigrants are considered Western and thus are excluded from the sample. The female dummy and the age variable are self-explanatory, but only respondents aged 16-64 years are included in the analysis. Finally, u_i refers to unobserved heterogeneity between individuals, which are not controlled for.

Model 1a

$$\begin{aligned} pr(PE_income_{ij} = 1) \\ &= \alpha + \beta_1(time_{ij}) + \beta_2(education_{ij}) + \beta_3(immigrant_i) \\ &+ \beta_4(public_sector_{ij}) + u_i + \varepsilon_{ij} \end{aligned}$$

Model 1b

$$\begin{aligned} pr(PE_income_{ij} = 1) \\ &= \alpha + \beta_1(time_{ij}) + \beta_2(education_{ij}) + \beta_3(immigrant_i) \\ &+ \beta_4(public_sector_{ij}) + \beta_5(PE_job_{ij}) + u_i + \varepsilon_{ij} \end{aligned}$$

Model 2a

$$\begin{aligned} pr(PE_contract_{ij} = 1) \\ &= \alpha + \beta_1(time_{ij}) + \beta_2(education_{ij}) + \beta_3(immigrant_i) \\ &+ \beta_4(public_sector_{ij}) + u_i + \varepsilon_{ij} \end{aligned}$$

Model 2b

$$\begin{aligned} pr(PE_contract_{ij} = 1) \\ &= \alpha + \beta_1(time_{ij}) + \beta_2(education_{ij}) + \beta_3(immigrant_i) \\ &+ \beta_4(public_sector_{ij}) + \beta_5(PE_income_{ij}) + u_i + \varepsilon_{ij} \end{aligned}$$

Model 3

$$\begin{aligned} pr(PE_income * contract_{ij} = 1) \\ &= \alpha + \beta_1(time_{ij}) + \beta_2(education_{ij}) + \beta_3(immigrant_i) \\ &+ \beta_4(public_sector_{ij}) + u_i + \varepsilon_{ij} \end{aligned}$$

The results for Models 1a-3 are shown in Table 2.1. Indicator 2 shows an increase in precarious employment over time in both models, whereas Indicator 1 shows no trend in either model, and the indicators' conjunction increases. Hypothesis 1 is thus supported by Indicator 2, not supported by Indicator 1, and is supported by their conjunction. As expected, educational level is negatively related to all indicators, thus providing broad support for hypothesis 2. Being employed in the public sector has a significant negative effect on Indicator 2, but not on Indicator 1 or on their conjunction. Hence, hypothesis 3 finds support only with Indicator 2. To identify the factors underlying the results in Table 2.1, similar analyses are performed on the separate dimensions of Indicator 1 and 2. Five random effects probit models are estimated, each model using one dimension of precarious employment as a dependent variable and the other four dimensions as independent variables. In all other respects, the models are similar to Models 1a, 2a and 3. The results are shown in Table 2.2. As noted earlier, precarious-employment-as-contract-insecurity increased in recent years, whereas precarious-employment-as-income insecurity did not.

Table 2.1: Results from random effects probit models with Indicator 1 as the dependent variable (model 1a-1b), Indicator 2 as the dependent (model 2a-2b), and their conjunction as the dependent (model 3).

	(1a) PE_income	(1b) PE_income	(2a) PE_ contract	(2b) PE_ contract	(3) PE_income* PE_contract
Wave	0.00186 (0.35)	-0.00107 (-0.21)	0.0478*** (7.96)	0.0453*** (7.77)	0.0461** (2.76)
Education	-0.396*** (-12.81)	-0.380*** (-12.64)	-0.113*** (-4.53)	-0.0964*** (-3.94)	-0.535*** (-5.68)
Non-Western Immigrant	-0.0884 (-0.47)	-0.118 (-0.64)	0.378* (2.46)	0.376* (2.53)	0.196 (0.34)
Public Sector	-0.0748 (-1.33)	-0.0590 (-1.08)	-0.335*** (-6.15)	-0.324*** (-6.11)	-0.267 (-1.44)
Female	1.212*** (17.52)	1.179*** (17.67)	0.303*** (5.98)	0.266*** (5.39)	0.768*** (4.44)
Age	-0.0451*** (-16.50)	-0.0411*** (-15.48)	-0.0427*** (-17.11)	-0.0398*** (-16.30)	-0.116*** (-11.19)
PE_contract		0.429*** (6.49)			
PE_income				0.398*** (5.40)	
N	21864	21864	21864	21864	21864

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table 2.2 shows that the increase measured with Indicator 2 results from increases in the incidence of numerically flexible contracts and in unemployment risk after dismissal. The lack of a trend as measured with Indicator 1, by contrast, seems driven by stability in the wage distribution. In general, thus, the increase in precarious employment over time as measured by the integrated indicator seems to result from the increase in precariousness-as-contract-insecurity. Regarding education, the broadly negative effects noted in Table 2.1 seem more diffuse when examining the separate dimensions. The negative relation between education and Indicator 1 is driven by the high wages that the highly educated tend to earn, even though they tend to have lower supplementary income and shorter UB entitlements. Regarding Indicator 2, the results indicate that the highly educated do not tend to have more permanent contracts than do the less educated, but that they tend to be unemployed for a shorter duration after

dismissal. This does not make each separate job particularly secure, but does increase employment insecurity in a broader sense. Overall, the negative relation between education and precarious employment as measured by the integrated indicator seems to be driven by the high wages and short unemployment duration that the highly educated tend to have.

Table 2.2: Results from random effects probit models with wage dimension (PE_wage, Model 4), Supplementary Income (PE_sup, Model 5), Unemployment Benefit Entitlements (PE_UB, Model 6), Numerically flexible Contract (PE_flex, Model 7) and Duration of Unemployment (PE_unemp, Model 8) as the dependent variables.

	(4)	(5)	(6)	(7)	(8)
	PE_wage	PE_sup	PE_UB	PE_flex	PE_unemp
Wave	0.0000364 (0.01)	-0.0264*** (-8.55)	-0.00848* (-2.15)	0.0343*** (8.28)	0.0148*** (5.97)
Education	-0.672*** (-22.75)	0.0259 (1.64)	0.0541** (2.77)	-0.00850 (-0.41)	-0.0797*** (-7.51)
Non-Western Immigrant	-0.0466 (-0.28)	-0.0686 (-0.65)	0.0984 (0.73)	0.243+ (1.84)	0.226** (3.27)
Public Sector	-0.00592 (-0.11)	-0.0844* (-2.53)	0.0192 (0.46)	-0.304*** (-7.08)	-0.135*** (-6.05)
Female	2.442*** (30.78)	0.525*** (15.30)	0.0340 (0.77)	0.207*** (4.67)	0.0235 (1.04)
Age	-0.0350*** (-14.31)	-0.0241*** (-16.63)	-0.0298*** (-14.87)	-0.0415*** (-20.16)	-0.0091*** (-9.64)
PE_wage		-0.162*** (-4.30)	0.123* (2.39)	0.609*** (13.39)	-0.0154 (-0.56)
PE_sup	-0.155*** (-3.54)		-0.00730 (-0.20)	0.312*** (8.46)	0.0704** (3.29)
PE_UB	0.154* (2.43)	-0.0356 (-0.89)		0.461*** (7.68)	0.0542+ (1.75)
PE_flex	0.699*** (13.89)	0.327*** (9.27)	0.479*** (8.88)		0.233*** (8.97)
PE_unemp	-0.0426 (-1.07)	0.0405 (1.54)	-0.0541 (-1.61)	0.169*** (5.09)	
N	21864	21864	21864	21864	21864

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

The positive relation between Indicator 2 and non-Western immigrant status is explained partly by the high incidence of numerically flexible contracts in this group and, more prominently, the high tendency they have to be unemployed for a long duration. The lack of a trend as measured with Indicator 1 however, seems related to the fact that non-Western immigrants earn as much as non-immigrants do, as do their partners. This earning parity results in a non-significant relation between immigrant status and the risk of precarious employment as measured by the integrated indicator. Finally, the negative relation between Indicator 2 and being employed in the public sector is driven by the high job stability in that sector, i.e., a higher incidence of permanent contracts than in the private sector and a shorter duration of unemployment thereafter. The lack of an effect of employment in the public sector on Indicator 1 again seems accounted for by the lack of wage differences and by the duration of unemployment benefits in that sector, both of which result in no relation between the public sector and the integrated indicator.

The operationalisation of the dimensions of precarious employment indicates that varying τ alters the size of the precarious segment. Varying τ will in turn vary the strictness of the conditions for precariousness and thus change the number of individuals included in the set of the precariously employed⁹. However, it remains to be assessed how the coefficients in Models 1b, 2b and 3 react to changes in the threshold values for the separate dimensions. When radically different coefficients are found using slightly different values for τ , the reliability of the results is compromised. To test the effects of varying τ on the indicators, two tests are constructed: As a first test, τ for separate dimensions will be varied between 40% and 80% of the median wage for the financial indicators and between 0 and 8 months for unemployment indicators, using a uniform random function (test 1: T1). However, because of the use of conjunctions in constructing the PE indicators, T1 might be biased toward generating small numbers of precarious employees. Therefore, a second test is performed in which τ varies randomly but in a 10% bandwidth from each other (T2). This artificial “stickiness” of the τ values will ensure that less strict thresholds are more strongly represented, though it will be unable to detect anomalies introduced by widely diverging τ 's present in the first test.

As shown in Table 2.3, for Model 1b the coefficients of education, female, age and PE_contract are robust in their sign and have relatively low standard

⁹ See Leschke, Watt, & Finn (2008) and Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve (2011), all of whom encounter similar issues when integrating and, in their cases, weighing dimensions.

deviations in both tests, thus indicating that the influence of the specific value of the threshold use in the models is modest.

Table 2.3: Central tendency and ranges of Model 1b, Model2b and Model 3 coefficients for randomly varying τ for 100 iterations per model.

		T1				T2			
		mean	min	max	sd	mean	min	max	sd
Model 1	Wave	0,00	-0,01	0,04	0,01	0,00	-0,01	0,02	0,01
	Education	-0,45	-0,56	-0,33	0,06	-0,45	-0,63	-0,27	0,09
	Public Sector	-0,08	-0,29	0,06	0,07	-0,11	-0,31	-0,01	0,09
	NW Immigrant	-0,06	-0,58	0,24	0,14	-0,05	-0,36	0,28	0,18
	Female	1,42	1,04	2,00	0,23	1,39	0,88	1,99	0,24
	Age	-0,04	-0,05	-0,04	0,00	-0,04	-0,05	-0,03	0,00
	PE_contract	0,52	0,37	0,67	0,06	0,53	0,44	0,61	0,03
Model 2	Wave	0,05	0,05	0,05	0,00	0,05	0,05	0,05	0,00
	Education	-0,10	-0,12	-0,09	0,01	-0,10	-0,12	-0,09	0,01
	Public Sector	-0,30	-0,32	-0,28	0,01	-0,29	-0,31	-0,28	0,01
	NW Immigrant	0,49	0,45	0,53	0,02	0,50	0,47	0,52	0,01
	Female	0,27	0,22	0,30	0,02	0,26	0,24	0,28	0,01
	Age	-0,05	-0,05	-0,05	0,00	-0,05	-0,05	-0,05	0,00
	PE_income	0,48	0,30	0,66	0,07	0,49	0,43	0,56	0,03
Model 3	Wave	0,05	0,01	0,10	0,02	0,05	0,00	0,10	0,02
	Education	-0,55	-0,72	-0,34	0,10	-0,56	-0,74	-0,31	0,12
	Public Sector	-0,28	-0,57	-0,05	0,11	-0,27	-0,54	-0,03	0,13
	NW Immigrant	0,47	-0,16	1,18	0,33	0,50	0,01	1,23	0,32
	Female	0,94	0,63	1,27	0,15	0,97	0,69	1,33	0,18
	Age	-0,11	-0,15	-0,06	0,01	-0,11	-0,13	-0,09	0,01

The wave, the public sector and the immigrant coefficients behave erratically in both tests, but this might be expected, given that these variables were non-significant in the model from the start. For Model 2b, all coefficients are robust in both tests, thus implying that patterns in precariousness as contract insecurity are highly unresponsive to changes in τ . Finally, for Model 3, only the coefficient of non-Western immigrant is not robust to changes in τ . Though robust, the coefficient of the public sector was non-significant in the original model.

2.6. Discussion

In response to shortcomings in the empirics of Kalleberg (2011) and other work, this chapter aimed to introduce a conceptualisation of precarious employment to structure this dissertation. The main critique of Kalleberg (2011) and other research is that they rely on separate indicators, which are disconnected from the individual level. Based on theory, it was argued that for an employee to be precarious, several contract-, individual- and institutional-level factors must link to the individual level to create a threatening insecurity for the individual. Two indicators for precarious employment were defined to represent the two distinct uses of the concept of precarious employment in academic discourse. Indicator 1 represented precariousness-as-income-insecurity, while Indicator 2 represented precariousness-as-contract-insecurity. The two indicators were operationalised and scores were calculated using the Dutch OSA-panel. Additionally, the two indicators were integrated to obtain a full account of how income insecurity and contract insecurity might be related in today's labour market. To evaluate the performance of the proposed indicators and their integration, the indicators were used in random effects probit models to test several hypotheses. The differences in the results between this indicator (Indicator 2) and the indicator of precarious-employment-as-income-insecurity (Indicator 1) makes the cases for explicitly differentiating between the two more salient. Indicator 2 was mostly unrelated to the proposed variables, mainly due to the stability and compressed nature of the distribution of Dutch wages. Moreover, the observation that the highly educated tend to have an equal risk of being employed on a numerically flexible contract as do the less educated, but are considerably less likely to be unemployed for a long duration thereafter, suggests caution when using non-standards contracts to indicate precarious employment.

As discussed in Chapter 1, in the remainder of this dissertation the separate dimensions of precarious employment are studied, including some of their most relevant interrelations. Chapter 3, 4 and 5 address precarious-employment-as-contract-insecurity in more detail, by focussing on numerical flexibility and its relation with the risk of unemployment. In Chapter 3, the relation between job-characteristics and numerical flexibility is studied. In Chapter 4, this study is extended to include the effects of Employment Protection Legislation. Additionally, Chapter 4 expands this study to the interrelations between numerical flexibility, Employment Protection Legislation and the risk of future numerical flexibility and unemployment. In Chapter 5, the relation between employers' HRM attitudes and numerical flexibility is studied. Chapter 6 then, studies the relation between contract insecurity and financial insecurity in more detail, by focussing on the earnings and unemployment benefit entitlements of numerically flexible employees, including the effects of institutions relating to financial security and redistribution.

Chapter 3

Job complexity and numerically flexible employment

3.1. Introduction

Chapter 2 defined precarious employment as the employment of vulnerable employees on numerically flexible contracts with unsupportive entitlements derived from the employment relation. This chapter is the first in a series of three chapters (Chapters 3, 4, and 5) that focus specifically on insecure and numerically flexible employment.

A large body of sociological research assesses the employee characteristics related to the likelihood of an employee being insecurely employed (Ahmad, 2008; Porthé, et al., 2010; Vosko, 2006). In many economic studies, the drivers of numerical flexibility are discussed as pertaining to the well-argued relation between product-market volatility and the use of numerically flexible employment (for instance, see De Graaf-Zijl, 2005; Foote & Folta, 2002): increased product-market volatility leads to an increased desire for flexibility amongst employers (Abrahams, 1988; Houseman, 2001). Because some characteristics of a job seem conducive to numerical flexibility (Masters & Miles, 2002), the scarcity of research on the relation between job characteristics and numerical flexibility is striking. As discussed in the theoretical framework in Chapter 1, it is often argued that employees with higher associated replacement costs are less likely to be employed numerically flexible, as dismissing them to adjust to market volatility would be too expensive for the employer (Kalleberg, Reynolds, & Marsden, 2003). Moreover, employees whose performance is difficult or expensive to monitor are likely to work relatively autonomously, which drives employers to use permanent contracts to commit them to organisational goals (Emmenegger, 2009). However, the sources of these replacement and monitoring costs are often discussed and measured along the lines of educational attainment or occupation (Gebel & Giesecke, 2011) or by relying on reported replaceability and the ability to monitor (Masters & Miles, 2002) rather than by observing *ex ante*-defined task characteristics, which would be a more appropriate test of transaction cost theory (Goldthorpe, 2000).

This chapter aims to assess the relationship between job complexity and numerical flexibility, while Chapter 4 addresses the relation between autonomy and skill specificity, partly generated by job complexity, and numerical flexibility. First, earlier attempts to assess the job-related drivers of numerical flexibility are discussed, and the issues that this chapter addresses are outlined. Second, using Dutch data containing observations on employees nested in employers, the link between job complexity and numerically flexible contracts is examined. This chapter shows that employees' risk of numerically flexible employment decreases with increasing job complexity. An analysis of the compositions of the groups of recently hired and recently departed employees shows that this is at least partly a result of employees in complex jobs being incorporated into the organisational hierarchy by being transferred from temporary to permanent contracts.

Moreover, some support is found for the expectation that the relation between job complexity and numerical flexibility is stronger in more volatile environments.

3.2. Theoretical framework

3.2.1 Earlier work on insecure employment and numerical flexibility

Much research into numerically flexible and precarious employment focuses on the employees most likely to be so employed (Ahmad, 2008; Kim & Kurz, 2001; Porthé, et al., 2010; Vosko; 2002, 2006). The employer- and job-related drivers of precarious employment are generally discussed in the context of research on the alleged growth in numerically flexible employment over time (Kalleberg; 2009, 2011; Rodgers & Rodgers, 1989). Kalleberg (2011, p. 83), for instance, argues that employers contribute to the rise in precarious employment through a growing use of market-mediated and individualised employment relations, which are valuable tools in employers' search for greater flexibility and profits. Though most scholars seem to agree that employers' tendency to staff flexibly has increased in recent years, differences appear with regard to the explanation for this increase.

Economists and management scientists tend to argue that increased product-market volatility has led employers to increase their ability to adjust staffing -levels on short notice, against low costs (Abraham, 1988; Houseman, 2001; Lepak, Takeuchi, & Snell, 2003; Matusik & Hill, 1998). When arguing that organisations adopt similar staffing policies to decrease uncertainty, many sociologists seem to subscribe to the idea that volatility influences Human Resource Management (HRM) practices (DiMaggio & Powell, 1983; Kalleberg, Reynolds, & Marsden, 2003). Sociologists additionally highlight the way in which institutional processes shape organisational practices, such as the degree of bureaucratic control of an organisation, whether its employees are unionised, or whether there exists government oversight into affirmative practices (Davis-Blake & Uzzi, 1993; DiMaggio & Powell, 1983). Additionally, scholars in various fields identify the growth of the service sector and the growing importance of short-term obligations to capital markets as drivers of numerical flexibility (Kalleberg, 2011). Moreover, neoliberal government policy is argued to complement these processes (Standing, 2011).

As outlined in Chapter 1, transaction cost scholars emphasise the importance of the monitoring and replacement costs of specific employees in influencing employers' contract decisions. From a transaction cost perspective, employers would benefit from incorporating employees with high replacement costs into the organisational hierarchy by hiring them on a permanent contract rather than opting for market-mediated employment relations (Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003; Williamson, 1981). Moreover, employers might use numerically flexible contracts and permanent contracts as

incentives, depending on the ease with which employees' effort can be monitored (Gebel & Giesecke, 2011; Goldthorpe, 2000; Polavieja, 2003). Specifically relevant is the seminal study by Breen (1997), in which he argues that the information asymmetry associated with the employment of Goldthorpe's (2000) "service class" worker prohibits the extensive commodification of the employment relation and thus the transfer of market risk from employer to employee through numerically flexible employment. When the environment becomes more volatile, this drives employers to increase numerical flexibility amongst employment relations for which this information asymmetry is limited (Breen, 1997).

Traditionally, transaction cost theory identifies the job as generating transaction costs: regardless of the employer or employee, some jobs are inherently more difficult to monitor and require a higher level of firm-specific skills than others (Goldthorpe, 2000; Williamson, 1981). However, research into this field has often relied on indicators for transaction costs as reported by the employer or employee (Masters & Miles, 2002) or proxies that are of limited validity (Gebel & Giesecke, 2011). The indicators used by Masters & Miles (2002), which are among the most valid indicators used to date, rely on human resource managers' assessment of how long it would take to train a potential replacement for a specific job (transaction-specific investment) and on a series of statements indicating the extent to which performance can be measured (monitoring). Because they ask a respondent to evaluate the extent to which a certain existing job requires a long period of training or allows for monitoring, these indicators run the risk of confounding the characteristics of the job, the employee performing it and potentially the employer. The human resource managers questioned by Masters and Miles likely based their evaluation of a job on their experience with training employees for that particular job or their experience with monitoring them. As such, evaluations of transaction costs may confound employees' levels of skill (in the case of training periods) or their trustworthiness (in the case of monitoring and autonomy) with the actual characteristics of the job, to which Williamson (1981) and Goldthorpe (2000) aimed to draw academic attention.

As a first test of the value of transaction cost theory for explaining numerical flexibility, this chapter assesses whether job complexity, which is argued to have implications for employees' level of autonomy and firm-specific skills, influences employers' tendency to hire employees on numerically flexible contracts. Additionally, it is assessed whether this relationship is reinforced by increasing volatility in the company's output market, as proposed by Breen (1997). If so, this provides additional support for Breen's (1997) information asymmetry proposition and thus for the transaction cost assumptions on which this proposition rests. Crucially, the dataset that is used in this chapter contains information on tasks associated with a job as classified by an independent party (the labour inspectorate), i.e., not the employer or the employee. This allows a strong separation of job characteristics from employee and employer

characteristics and thus remains close to the core proposition of transaction cost theory. Moreover, the repeated-cross-sectional structure of the data allows for an assessment of the extent to which employees in complex jobs are incorporated into the organisational hierarchy.

3.2.2. Job complexity and numerical flexibility

Job characteristics expectedly influence whether employees will be subject to numerical flexibility through their implications for transaction costs (Goldthorpe, 2000; Williamson, 1981). It is proposed that the complexity of the job is specifically relevant, because increasing complexity generates increasing costs associated with the monitoring of employees and their accumulation of firm-specific human capital. Simple jobs are characterised by limited uncertainty concerning task input, output and means-to-end linkages (Campbell, 1988) and consequently allow employers to easily monitor employees' effort on the basis of input or output indicators (Goldthorpe, 2000). In line with the discussion in the theoretical framework proposed in Chapter 1, the low monitoring costs associated with simple jobs imply a carrot-and-stick incentive structure that needs not induce commitment, such as an incentive structure based on piece rates, commissions or tips (Emmenegger, 2009). For complex jobs, direct monitoring becomes too costly through the high uncertainty regarding the required input, the way the output comes about, and what constitutes proper quality output (Campbell, 1988). Because these jobs cannot reasonably be so circumscribed as to provide the employee with an employer-designed working manual, management will need to grant a degree of autonomy to employees in performing their jobs (Emmenegger, 2009). With increased autonomy, information asymmetries between employer and employees increase, generating the risk of principal-agency problems, which are thus related to job complexity (Breen, 1997; Gërxhani & Koster, forthcoming; Jensen & Meckling, 1976; Shapiro, 2005). Given the risk of difficult-to-detect suboptimal employee performance that increased autonomy entails, employers rely on eliciting employee commitment by aligning the goals of the employee with the goals of the organisation through permanent contracts and internal labour markets (Emmenegger, 2009; Osterman, 1987; Schram, Brandts, & Gërxhani, 2010). Additionally, employers may incentivise employees by promising a potential conversions of their numerically flexible contract into a permanent contract, with a low conversion rate providing a strong incentive at the cost of commitment and a high conversion rate providing a weaker incentive in favour of eliciting commitment. For highly complex jobs and autonomous employees, this would imply a high conversion rate and thus a high probability of a permanent contract, while for low autonomy employees this would imply a low conversion rate and a high probability of numerical flexibility (Polavieja, 2005). Moreover, as outlined in Chapter 1, employees in complex jobs are more likely to accumulate firm-specific human capital. Since replacing them

would thus likely result in lost productivity, employers have an additional incentive to incorporate them into the organisational hierarchy (Goldthorpe, 2000).

From the above discussion, it is expected that employees in low-complexity jobs are easy to monitor, have measurable targets, and have high performance rewarded with some sort of bonus, or the renewal of a temporary contract (Engellandt & Riphahn, 2005). These practices are expectedly complementary with numerical flexibility. Conversely, employers use permanent contracts to incorporate employees that perform complex and difficult-to-monitor jobs in the organisational hierarchy using permanent contracts, thus committing them to organisational goals and preventing having to replace them (Emmenegger, 2009). This constitutes hypothesis 1:

H1: Employees in highly complex jobs have a lower risk of being employed on a numerically flexible contract than do employees in less complex jobs.

According to the theoretical mechanism, employees in more complex jobs should be incorporated into the organisational hierarchy by being moved into a permanent contract after some time in the company, whereas this is less true for employees in less complex jobs. This leads to hypothesis 2:

H2: Employees in more complex jobs are more likely to move into a permanent contract after some time in the company.

3.2.3. Volatility, job complexity, and numerically flexible employment

Volatility refers to the degree to which shifts in demand for a firm's output are strong and unpredictable from the point of view of the firm. Employers in volatile environments are likely to hire numerically flexible workers to adjust staffing levels to fluctuations in workload, which reduces costs by making it unnecessary for employers to hire permanent workers in times of peak workload (Kalleberg, Reynolds, & Marsden, 2003). Product market volatility thus implies personnel volatility (Foote & Folta, 2002; De Graaf-Zijl, 2005; Kalleberg, Reynolds, & Marsden, 2003). This is supported by findings indicating that employers utilise a labour force of replaceable and scalable labour in fluctuating low-end markets, be it through seasonal demand (McNamara, Bohle, & Quinlan, 2011; Smith, 1997; Tésits & Szenoradszki, 2010) or business cycle and recessionary effects (Caire, 1989; OECD, 2010). Moreover, Davis-Blake & Uzzi (1993) argue and find the opposite for oligopolistic and stable environments.

When volatility increases, employers are driven to make more employees numerically flexible, starting with those employees for whom this does not cause a misalignment of incentives or whose output suffers least from a misalignment

of incentives (Breen, 1997). Because complex jobs imply an information asymmetry between the employer and the employee, hiring employees in complex jobs on numerically flexible contracts results in a misalignment of incentives, and more so for increasing complexity. The negative effect of decreased productivity on output that results from a misalignment of incentives is likewise stronger for employees in complex jobs if it is assumed that they produce more valuable output (i.e., they provide more marginal revenue). Additionally, because employees in complex jobs likely accumulate more firm-specific human capital, having to replace them in times of volatility causes the employer to incur higher costs than when employees in less complex jobs with less skill specificity are concerned. As volatility increases, employees in low complexity jobs should thus be comparatively more at risk of being employed on a numerically flexible contract than employees in high-level jobs, which constitutes hypothesis 3.

H3: Volatility interacts negatively with job complexity on an employee's risk of numerically flexible employment.

It should be noted that sources of volatility matter for staffing decisions taken by employers. Abraham (1988), for instance, shows that variability in demand resulting from seasonal fluctuations is less strongly related to the use of flexibility than variations resulting from yearly fluctuations. Additionally, Abraham (1988) finds that seasonal fluctuation is most often met by hiring short-term employees rather than by hiring employment agency temporaries, though these results are largely descriptive. Supporting this, based on multivariate models, Houseman (2001) finds a positive relation between seasonal variation and the use of agency temporaries and short-term temporary hires, whereas business cycle effects seem predominantly related to the hiring of agency temporaries. Using conjoint analysis, however, De Graaf-Zijl (2005) finds no clear relation between numerically flexible staffing decisions and the sensitivity of the company to the business cycle in The Netherlands. These findings partly resonate with Kalleberg et al (2003), who find that seasonality is consistently related to numerical flexibility, whereas cyclicality is not. Given these ambiguous findings, the source of volatility is explicated in the analyses in this chapter.

3.3. Method

3.3.2. Data

To test the proposed hypotheses, the “Arbeidsvoorwaardenonderzoek (AVO, Employment Conditions Study)” from the Dutch Labour Inspectorate is used¹⁰. The used subset of the AVO data is a repeated cross-section, with each cross-

¹⁰ A background to the Dutch labour market is presented in Chapter 2.

section containing two waves of observations on the level of the employer. AVO was published in 2003, 2005 and 2007: the 2003 round contains a cross-section of companies and employees surveyed in October 2001 (wave 1) and again in 2002 (wave 2), the 2005 round contains a cross-section of companies and employees surveyed in October 2003 (wave 1) and 2004 (wave 2), and the 2007 round contains a cross-section of companies and employees surveyed in October 2005 (wave 1) and 2006 (wave 2). For the collection of data in each round, a stratified sample of companies employing one or more employees was constructed first. The samples contained 280 (35 sectors by eight size-classes) strata and 1852 companies in 2001/02. In 2003/04 and 2005/06, it contained 288 strata (36 sectors by eight size-classes) and 2557 and 2628 companies, respectively. Within the sampled companies, a sample of employees was drawn to be representative of employees staying in the company for both waves or leaving or entering the company between wave 1 and wave 2. In the 2001/02 panel, 51424 employees were sampled in total, and 63606 and 64702 were sampled for 2003/04 and 2005/06, respectively. In all waves, weights were added to correct for the non-random probability of employees and companies in different sectors being sampled.

On the level of the company, AVO contains variables with regard to the sector the company primarily operates in, the number of employees, the numbers of employees who stayed (stayers), left (leavers) and came (comers) between waves, and a number of variables on non-wage reward schemes. On the level of the employee, AVO contains variables on gender and age, wages and other rewards, job level and occupation, level of education, coverage by a collective agreement, hours worked and the type of contract (either flexitime or not flexitime and either temporary or not temporary), and whether the employee was a stayer, a leaver or a comer. Because employees are sampled to be representative of employees within a company, company-level aggregates of variables can be constructed from employee-level variables. The nested design makes AVO well-suited to answer questions with regard to sector- and employer-level influences and strategies and their effect on the level of the employee. The main disadvantage of the dataset is the paucity of socio-economic variables on the level of the employee and the fact that employment-agency employees are matched to their *de jure* employers, i.e., the agency, rather than their *de facto* employers.

Crucially for this research, AVO contains no data on volatility on either the sector level or the company level. Admittedly, AVO contains data that can be used to assess personnel volatility, which could be used as a proxy for environmental volatility. However, flexibility strategies and personnel volatility are so closely related that reversed causation is considered too large an issue. As such, personnel volatility is unsuitable for testing the proposed hypotheses. Alternatively, data on volatility on the sectorial level is imputed from another dataset, i.e., the OSA-demand panel. The OSA-demand panel is panel dataset

currently supplied by the Dutch “Sociaal Cultureel Planbureau (SCP)” that covers the period from 1989 to 2009 with biennial intervals. OSA tracks and surveys a random sample of employers from all sectors of economic activity in the Netherlands. In the 2001, 2003 and 2005 waves of the OSA, employers were asked whether they experienced cyclicity or seasonality in demand in the previous period. From their answers to these questions, sector-level measures of cyclicity and seasonality can be calculated.

3.3.3. Operationalisation: dependent variables

Whether an employee is hired on a numerically flexible contract is operationalised by identifying contracts that allow for weekly variation in working hours, i.e., flexitime contracts, and contracts that allow the employer to dismiss employees after a fixed period of employment without having to face regulatory protections, i.e., temporary contracts. They are coded “0 if non-flexitime and 1 if flexitime” and “0 if permanent and 1 if temporary”, respectively. The company-level practices with regard to numerical flexibility per SBI 1-digit sector are shown in Figure 1.2 in Chapter 1. Regardless of whether flexitime or temporary contracts are concerned, the distribution of the proportion employers use is highly skewed towards low proportions. More specifically, with regard to flexitime contracts, in all sectors, the median equals 0, save for hotels and restaurants. For temporary contracts, this is less true, indicating that temporary contracts are more regularly used by employers. Although the median tends to be close to zero in most sectors, the practice of making some portion of the workforce numerically flexible is not a rarity. In many sectors, one or more employers have made their whole workforce numerically flexible, and many more sectors have a strongly fat-tailed distribution. These descriptive findings are consistent with earlier findings on the distribution of numerically flexible contracts on the company level (Houseman, 2001).

3.3.4. Operationalisation: independent variables

Job complexity is measured through a frame of reference for wage scales designed by the “Loontechnischdienst”, which is currently a part of the Dutch Labour Inspectorate. This “job-complexity” variable was recorded for each job by representatives of the Labour Inspectorate in each of the companies in the survey (Hoeben, Faas, Bos, & Samadhan, 2007).

Table 3.1: Categories of the job-complexity variable, translated from “Arbeidsvoorwaardeontwikkeling in 2006 (Hoeben, Faas, Bos, & Samadhan, 2007)”.

Job level	
Code	Description
1	"Very simple and repetitive tasks that require no schooling and little experience and are performed under direct supervision"
2	"Simple to quite simple tasks that are generally repetitive, require (some) lower administrative or technical knowledge and experience, and require some autonomy but are generally supervised"
3	"Less simple tasks that tend to repeat, require lower administrative and technical knowledge and experience, and are to some extent performed autonomously"
4	"Less simple tasks that tend to vary, require lower administrative and technical knowledge and experience, are supplemented with an additional vocational training in a specific procedure, and are to an extent performed autonomously"
5	"Difficult tasks of a varying nature that require an intermediate level of administrative or technical knowledge and experience and are generally performed autonomously"
6	"Customised tasks within a specific field that require a higher level of knowledge and experience and are performed autonomously"
7	"Tasks of an analytical, creative, or social nature performed on the basis of autonomous judgment and that require knowledge of an academic or similar level, including managing employees or preparing policy"
8	"Managing medium-sized enterprises or similar units, services or personnel bodies, coupled with participation in policy preparation or conception"
9	"Managing large enterprises or subsidiaries that can be considered as such"

The variable describes the characteristics of tasks associated with a job, specifically, the degree to which they are routinised, the degree to which they require the employee to operate autonomously, and the degree to which they require experience (not necessarily on the job) and a high educational level. The variable is coded as shown in Table 3.1 and the distribution of job complexity across occupations is shown in Figure A.1 in Appendix A.

Although the strength of this variable is the fact that it partly prevents the confounding of jobs with employee characteristics, a drawback of this variable is the fact that for higher categories, the description refers to “managing in combination with what is being managed” and information on the actual content of the tasks disappears. However, this is likely partly because tasks at those levels are so diffuse and complex and require such a degree of autonomy that they are difficult to capture in a two-line description. If so, higher categories still proxy job complexity. Moreover, the descriptions refer to knowledge and experience, which makes it likely that they capture some information on educational attainment and the employment history. The former is addressed by controlling for education when estimating models. The latter cannot be not addressed directly, which may introduce some noise into the analysis. Because the variable is very specific in its description. of the degree to which tasks are difficult and repetitive while largely separating it from the employee currently performing the job, it is uniquely suited for testing hypotheses 1 to 3.

To test hypothesis 2, a dummy “mobility status” variable is used to indicate whether employees stayed in the company during the reference year, whether they were hired into the company, or whether they left their positions in the company. Though these groups are defined consistently, it should be noted that the reference category varies throughout the analysis. This is explained in more detail when discussing the relevant models.

To test hypothesis 3, indicators for both seasonality and cyclicity are used to account for the expected relevance of the source of volatility in staffing policy. As previously mentioned, AVO does not contain data on product market volatility, so these are imputed from the OSA-demand panel. In the 2001, 2003 and 2005 waves of the OSA, employers were asked whether they experienced cyclicity in demand in the previous period, and the available answers were “hardly any”, “some”, or “a lot”, coded 0, 1 and 2, respectively. Additionally, they were asked whether they experienced seasonality in demand, which they could answer with yes or no, coded 1 and 0, respectively. From employers’ answers to these questions, sector proportions are calculated as indicators of seasonality and cyclicity. These indicators depend on employers’ evaluations of market circumstances, which is in line with Abraham (1988) and Houseman (2001). Because employers may evaluate their circumstances in reference to employers in the same sector and geographical area, these indicators may underestimate the difference between sectors. On the other hand, because these indicators refer to employers’ perceptions, they may be closer to employers’ actual practice than objective indicators of volatility. To assess the validity of the volatility measures, two-digit sectors are sorted by their mean levels of seasonality and cyclicity over the three waves of AVO in Figure A.2 and Figure A.3 in Appendix A, respectively. With regard to seasonality, agriculture and hotels and restaurants score highest. This supports the validity of the seasonality indicator given the inherent seasonality of harvesting and the sizeable difference between summer and winter

temperatures in the Netherlands and their effect on tourism and the exploitability of outdoor bars and restaurants. Services such as healthcare, banking, real estate and cleaning are ranked on the low side. Because the seasonal swings in the incidence of physical ailments and the use of money services and the occupancy and maintenance of houses and offices is expectedly low, this further supports the seasonality indicator. In the intermediate positions are the different manufacturing sectors, for which the extent of seasonal swings is expectedly dependent on the specific product. With regard to cyclicity, export- and luxury consumption- oriented industries, such as car, textile and computer manufacturing, are found on the high end. On the low end, healthcare, utilities and government are found. This supports the validity of the indicator for cyclicity.

3.3.5. *Estimation strategy*

To test hypothesis 1, logit models are estimated to assess the relation between job complexity and numerical flexibility (Models 1a and 1b). Second, to test hypothesis 2, models are estimated to address the distribution of numerical flexibility for employees of different mobility status. Models 2a and 2b are estimated to test the difference in the effect of job complexity between stayers and leavers on the one hand and comers on the other for both flexitime (2a) and temporary (2b) contracts. Additionally, Models 3a and 3b test the difference in effects for stayers on the one hand and leavers on the other for flexitime (3a) and temporary (3b) contracts. Three-level models are estimated with sector-fixed effects (level 3). Moreover, company-level variables (level 2) are controlled for by adding the company-level means of the individual-level covariates (level 1). The result is six models in total.

In these models, $\Pr(\text{flex}_{ijk}=1)$ and $\Pr(\text{temp}_{ijk}=1)$ refer to the probability that individual i with employer j in sector k is employed on a flexitime or temporary contract, respectively. “Job_complexity” is the variable for measuring the complexity of the job, “comer” is a dummy variable for the mobility status of employees coming into the company, and “leaver” is a similar dummy for employees who left the company. It should be noted that the “comer” dummy has the group of stayers and leavers as the reference category, whereas the “leaver” dummy has only the group of comers as a reference. All models contain year dummies to control for changes over time, sector dummies for the sector-fixed effects, and a vector of company-level averages of individual-level covariates (mean age, proportion of women, etc.). This vector also includes company size as a control (Davis-Blake & Uzzi, 1993). All models contain a vector of individual-level covariates, namely, educational level, which is likely strongly related to job complexity and numerical flexibility (Gebel & Giesecke, 2011), gender because women may be more willing to accept numerically flexible employment than men,

occupation because this likely has added implications for transaction costs and job content (Goldthorpe, 2000) and for rents resulting from occupational closure (Weeden, 2002), and age because young employees may be more willing to accept numerically flexible contracts and may be more likely to be offered them (Barbieri, 2009).

Model 1a

$$\Pr(\text{flex}_{ijk} = 1) = \alpha + \beta_1(\text{job_complexity}_{ijk}) + \beta_2(D:\text{sector}_k) + \beta_3(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + u_{jk} + \varepsilon_{ijk}$$

Model 1b

$$\Pr(\text{temp}_{ijk} = 1) = \alpha + \beta_1(\text{job_complexity}_{ijk}) + \beta_2(D:\text{sector}_k) + \beta_3(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + u_{jk} + \varepsilon_{ijk}$$

Model 2a

$$\Pr(\text{flex}_{ijk} = 1) = \alpha + \beta_1(\text{job_complexity}_{ijk} * \text{comer}_{ijk}) + \beta_2(D:\text{sector}_k) + \beta_3(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + u_{jk} + \varepsilon_{ijk}$$

Model 2b

$$\Pr(\text{temp}_{ijk} = 1) = \alpha + \beta_1(\text{job_complexity}_{ijk} * \text{comer}_{ijk}) + \beta_2(D:\text{sector}_k) + \beta_3(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + u_{jk} + \varepsilon_{ijk}$$

Model 3a

$$\Pr(\text{flex}_{ijk} = 1) = \alpha + \beta_1(\text{job_complexity}_{ijk} * \text{leaver}_{ijk}) + \beta_2(D:\text{sector}_k) + \beta_3(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + u_{jk} + \varepsilon_{ijk}$$

Model 3b

$$\Pr(\text{temp}_{ijk} = 1) = \alpha + \beta_1(\text{job_complexity}_{ijk} * \text{leaver}_{ijk}) + \beta_2(D:\text{sector}_k) + \beta_3(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + u_{jk} + \varepsilon_{ijk}$$

Finally, u_{jk} represents the unobserved difference between companies, which, though extensively controlled for, are not eliminated completely, and ε_{ijk} represents the employee-level error term.

Based on hypothesis 1, it is expected that Models 1a and 1b show a negative main effect of job complexity. Because employees in complex jobs are expected to move into permanent employment after some time in the company (based on hypothesis 2), it is expected that the relation between job complexity and numerical flexibility is less strongly negative for recently hired employees compared to employees who were in the company already at that time..

“Employees who were in the company already at that time” is a somewhat ambiguous definition, as it is unclear for each comer who were in the company when they arrived: at a minimum at least all stayers, and at a maximum potentially all stayers plus all leavers. Since a decision on which of these two groups to use as the reference category is somewhat arbitrary and in both cases defensible, the models proposed use the group of stayers plus leaver. The main reason for this choice is simply the fact that including all leavers makes for a stronger test of the proposed relation, since they are expectedly more likely to be on temporary contracts and less so along the lines of job complexity than the group of stayers. It is expected that job complexity is a less strong (negative) predictor of numerical flexibility amongst the recently hired, which is interpreted to indicate that the sorting of contracts along the lines of job complexity happens partly after hiring. The interaction effect between job complexity and mobility status should thus be positive in models 2a and 2b. However, the “integration in the organisational hierarchy” proposition would only hold if the difference between the tendency of comers to be numerically flexible compared to employees already in the company is not completely explained by numerically flexible employees in complex jobs being more likely than employees in low complexity jobs to leave the company if not offered a permanent contract. Here, the group of stayers+comers might be used as the reference group, but this seems too strong a test for the argument. If job complexity were a stronger negative predictor for temporary employment in the group of leavers as compared to the stayers+comers, this would indicate that high complexity employees on temporary contracts are less likely to leave than be in the company at the observed point in time, as compared to low complexity employees. This is not needed for the argument: for integration into the organisation to be happening more for high complexity than low complexity employees, the observation that proportionally more high complexity employees out of the group of comers are integrated than low complexity employees suffices. . Consequently, job complexity is expectedly be a stronger negative predictor of numerical flexibility amongst employees leaving the company than amongst employees entering the company. If so, the difference between the inflow and outflow would be partly explained by a conversion of contracts within the company along the lines of job complexity. This would result in a non-positive interaction between job complexity and mobility status in Models 3a and 3b, i.e., job complexity would be an equal or stronger (negative) predictor of numerical flexibility amongst employees who left compared to those who were recently hired (comers).

To assess the effect of volatility, job level and occupation on the probability that an employee is employed on a flexitime or temporary contract, two otherwise identical analyses are performed with temporary and flexitime contracts as the dependent variables. Three-level logit models are used with random sector effects and company-level controls. The models are estimated twice for both dependent variables: once without a volatility*job-complexity interaction (Models 4a and 4b) and once with a volatility*job-complexity

interaction (Models 5a and 5b). In these models, “season” and “cycle” measure seasonality and cyclicity by sector, and “job_complexity” is the variable for measuring the complexity of the job. Additionally, the interaction terms of the volatility measures and job complexity are shown in models 5a and 5b. All models contain year dummies to control for changes over time, and company-level averages of individual-level variables. Individual-level variables are added to control for tenure, gender, educational level, and age of the employee as well as whether they are immigrants and/or covered by a collective wage agreement.

Model 4a

$$\Pr(\text{flex}_{ijk} = 1) = \alpha + \beta_1(\text{season}_k) + \beta_2(\text{cycle}_k) + \beta_3(\text{job_complexity}_{ijk}) + \beta_4(D:\text{year}_{ijk}) \\ + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + v_k + u_{jk} + \varepsilon_{ijk}$$

Model 4b

$$\Pr(\text{temp}_{ijk} = 1) = \alpha + \beta_1(\text{season}_k) + \beta_2(\text{cycle}_k) + \beta_3(\text{job_complexity}_{ijk}) + \beta_4(D:\text{year}_{ijk}) \\ + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + v_k + u_{jk} + \varepsilon_{ijk}$$

Model 5a

$$\Pr(\text{flex}_{ijk} = 1) = \alpha + \beta_1(\text{season}_k) + \beta_2(\text{cycle}_k) + \beta_3(\text{job_complexity}_{ijk}) \\ + \beta_4(\text{season}_k * \text{job_complexity}_{ijk}) + \beta_5(\text{cycle}_k * \text{job_complexity}_{ijk}) \\ + \beta_6(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + v_k + u_{jk} + \varepsilon_{ijk}$$

Model 5b

$$\Pr(\text{temp}_{ijk} = 1) = \alpha + \beta_1(\text{season}_k) + \beta_2(\text{cycle}_k) + \beta_3(\text{job_complexity}_{ijk}) \\ + \beta_4(\text{season}_k * \text{job_level}_{ijk}) + \beta_5(\text{cycle}_k * \text{job_complexity}_{ijk}) \\ + \beta_6(D:\text{year}_{ijk}) + \left(\sum \beta_{ijk}x_{ijk}\right) + \left(\sum \beta_{jk}x_{jk}\right) + v_k + u_{jk} + \varepsilon_{ijk}$$

U_{jk} represents the company-level variance due to unobserved heterogeneity, which is not fully fixed in the models. All models are estimated using the subset of companies with more than 10 employees and excluding the sector of business reserved for employment agencies. This last sector is strongly influenced by the sectors to which it supplies personnel, which is not possible to account for here.

3.4. Results

The results for Models 1a-3b are shown in Table 3.2.

Table 3.2: Results from three-level (sector, company, and employee) logit models with flexitime and temporary contracts as dependent variables and job complexity as the main independent. Sector dummies and company-level means of employee-level variables are added to control for unobserved heterogeneity. Controls are not shown. Data: Arbeidsinspectie, Arbeidsvoorwaardenonderzoek.

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	Flexitime contract	Temp. contract	Flexitime contract	Temp. contract	Flexitime contract	Temp. contract
Job complexity	-0.075*** (-37.50)	-0.032*** (-32.00)	-0.075*** (-37.50)	-0.034*** (-17.00)	-0.329*** (-6.96)	-0.088*** (-6.84)
Mob. status: comer (ref: stayers and leavers)			0.174* (2.00)	2.496*** (42.31)		
Comer*Job complexity			0.00312 (0.26)	0.015*** (7.50)		
Mob. status: leaver (ref: comers)					-0.0427 (-0.70)	-0.977** (-12.30)
Leaver*Job complexity					-0.0165 (-0.86)	-0.0434* (-2.67)
Sector and wave dummies	yes	yes	yes	yes	yes	yes
Company-level controls	yes	yes	yes	yes	yes	yes
Individual-level controls	yes	yes	yes	yes	yes	yes
N	145210	145210	145210	145210	42676	42676

t statistics in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Supporting hypothesis 1, the results from Model 1a and 1b show that job complexity is negatively related to the likelihood of being employed on a flexitime or temporary contract. Models 2a and 2b show that job complexity is a weaker negative predictor of the risk of a temporary contract for recently hired employees but not for flexitime. This, as expected, reflects the relatively indiscriminate use of temporary contracts as a “probation period” for recently hired employees. With the absence of an interaction effect, Model 3a shows that in terms of job complexity, the group of leavers reflects the distribution of flexitime contracts of the group of comers.

Models 3b shows that this is not the case for temporary contracts: the negative interaction shows that employees in complex jobs on temporary contracts are underrepresented amongst the group of leavers¹¹. In general, these results indicate that there is little transfer to and from flexitime contracts. Temporary contracts on the other hand, serve as a relatively indiscriminately applied device for hiring employees, with employees in complex jobs more likely to transfer to a permanent contract. This supports hypothesis 2.

The results for Models 4a-5b are shown in Table 3.3. Note that 0 corresponds with the lowest possible level of job complexity, as described when discussing the measures, which makes the main effects of seasonality and cyclicity interpretable as their effect on an employee in jobs of the lowest complexity. Model 4a shows that seasonality is positively related to the use of flexitime contracts, as might be expected. Curiously, however, cyclicity is negatively related to the use of flexitime contracts, while both cyclicity and seasonality are unrelated to the use of temporary employment. Confirming hypothesis 3, Models 5a and 5b show that seasonality interacts negatively with job complexity, which indicates that employees in less complex jobs bear the brunt of the need for flexibility induced by seasonal environments. As Model 5a shows, this holds for cyclicity as well, but only for flexitime contracts. As the main effect shows, however, this is a result of employees in complex jobs becoming more secure in increasingly cyclical environments rather than employees in less complex jobs becoming less secure. This reflects the unexpected effect of cyclicity in Model 4a. Finally, Model 5b shows no interaction between job complexity and cyclicity for temporary contracts.

3.5. Discussion

In this chapter, employers' use of numerical flexibility was assessed as it follows from the transaction costs associated with the jobs for which employees are hired. The theoretical approach proposed a negative association between job complexity and numerical flexibility (hypothesis 1). Hypothesis 1 was confirmed, and the analysis supported the proposition that the underlying mechanism is one of employers incorporating employees in highly complex jobs into the organisation by offering them permanent contracts (hypothesis 2). It should be noted, however, that hypothesis 2 holds for temporary employment but not for flexitime. This may be a result of the "screening" function of temporary employment, whereas flexitime is more closely related to swings in supply and demand (as confirmed in Table 3.3). Additionally, causal interpretations of the results should be treated with caution. Since the analyses are based on cross-sectional data, the innate ability of employees could not be controlled for.

¹¹ This negative relation holds when the group of comers+stayers would be used as the reference groups, which, as explained in the methods section, was deemed a strong test of the argument.

Therefore, it remains undetermined whether and to what extent high ability employees select into highly complex jobs and through high productivity obtain a permanent contract.

Table 3.3: Results from three-level (sector, company, and employee) logit models with flexitime and temporary contracts as dependent variables and job complexity, seasonality and cyclicalities as the main independents. Company-level means of employee-level variables are added to control for unobserved heterogeneity. Controls are not shown. Data: Arbeidsinspectie, Arbeidsvoorwaardenonderzoek, OSA vraagpanel.

	(4a)	(4b)	(5a)	(5b)
	Flexitime contract	Temp. contract	Flexitime contract	Temp. contract
Job complexity	-0.073*** (-36.50)	-0.032*** (-32.00)	0.007 (0.88)	-0.019*** (-4.75)
Seasonality	2.12*** (3.53)	-0.197 (-0.61)	4,354*** (6.26)	0.976** (2.58)
Cyclicalities	-1,245** (-2.97)	-0.039 (-0.18)	0.299 (0.59)	-0.15 (-0.57)
Seasonality*Job compl			-0.071*** (-5.92)	-0.035*** (-5.83)
Cyclicalities*Job compl			-0.047*** (-4.70)	0.004 (1.00)
Sector dummies	no	no	no	no
Wave dummies	yes	yes	yes	yes
Company-level controls	yes	yes	yes	yes
Individual-level controls	yes	yes	yes	yes
N	145210	145210	145210	145210

t statistics in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Additionally, job complexity as a predictor of numerical flexibility was proposed to become more relevant with increasing environmental volatility (hypothesis 3). This effect was indeed supported by the data but less ambiguously for seasonal volatility than for volatility resulting from cyclicalities in demand. The latter showed no general effect on temporary employment or an interaction with job complexity, and it showed an unexpected negative effect on flexitime

employment. An issue at play might be that the models used to estimate these effects did not include sector-fixed effects because the volatility indicators did not show variation over time. The analyses might consequently pick up some unobserved heterogeneity between sectors. Highly cyclical sectors, for instance, were shown to be mostly related to manufacturing, which contains jobs that are conducive to the build-up of firm-specific skills and traditionally show high levels of unionisation, which are both negatively related to employers' overall use of numerical flexibility (Kalleberg, 2011). Using an indicator that allowed for a strong separation of job characteristics from employee characteristics, the analysis in this chapter provided support for the general proposition of transaction cost theory that the characteristics of tasks associated with jobs influence the skill specificity (and thus replaceability) of employees and the employer's ability to monitor them, resulting in a low likelihood of numerical flexibility for employees in complex jobs.

The results from this chapter indicate that the transaction costs associated with job complexity influence employers' decisions to hire an employee on a numerically flexible contract. These results indicate that some employees are at higher risk of numerical flexibility than others and may thus be at higher risk of precarious employment. However, it remains to be assessed to what extent the mechanism is indeed one of autonomy and skill specificity generating costs associated with numerical flexibility, and to what extent the relation between transaction costs and numerical flexibility is influenced by the institutional context. To expand the analysis, in the next chapter, the relation between numerical flexibility, skill specificity and autonomy as reported by employees is tested. This serves to further scrutinise the proposition that it is through employee autonomy and skill specificity that job characteristics influence numerical flexibility. Additionally, it is assessed how Employment Protection Legislation influences these transaction-cost mechanisms. Likewise, in Chapter 4, the relation between numerical flexibility and the risk of unemployment is studied to assess how two of the dimensions of precarious employment as proposed in Chapter 2 are linked. If numerical flexibility and the risk of unemployment are shown to be related, there apparently exists a tendency for at least two of the dimensions of precarious employment to go hand-in-hand, which increases the risk of precarious employment for the numerically flexible segments of the labour market. Finally, it is assessed how Employment Protection Legislation mediates the risk of numerically flexible employees ending up in unemployment.

Chapter 4

Institutions, numerical flexibility and the risk of unemployment

4.1. Introduction¹²

This chapter is the second in a series of two chapters assessing the job characteristics associated with numerical flexibility and expands the study from Chapter 3 to an international context.

Patterns of inequality in employment security differ considerably between institutional environments (as was indicated by Figure 1.1). Where the United States seem to have managed to limit inequality in employment 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). A strong separation of labour market insiders and outsiders increases the risk of outsiders being trapped in numerical flexibility as well (Gash, 2008). This is again exemplified by the Southern European countries, where mobility from temporary employment into permanent employment is relatively low, and transitions into self-employment and the informal economy are relatively likely (Muffels & Luijkx, 2008).

As mentioned in Chapter 1, this chapter relies on temporary employment as an indicator of numerical flexibility, which is a restriction generated by the data. First, this Chapter aims to assess whether inequalities in the risk of temporary employment are rooted in transaction costs and thus largely job-based, or whether they are rooted in employees’ educational attainment and thus skill-based. In contrast to Chapter 3, this chapter relies on self-reported autonomy and skill specificity as indicators of transaction costs. By additionally assessing the effect of Employment Protection Legislation (EPL) on inequalities in the risk of temporary employment driven by transaction costs, this chapter follows up on suggestions for further research made by Gebel & Giesecke (2011). It is expected that transaction costs associated with the monitoring of jobs and the degree to which the performing employees’ skills are firm specific interact with the relative strength of institutional protections of temporary contracts (EPLt) and permanent contracts (EPLp). Indeed, the degree of firm specific skills and the level of autonomy associated with the job are related to the risk of temporary employment, with the skill specificity mechanism acted upon by the relative protections of temporary and regular contracts. Second, it is assessed to what extent temporary employment tends to trap employees in the periphery of the labour market, and to what extent EPL characteristics are associated with this risk

¹² This chapter has been accepted, in a slightly different form, by the European Sociological Review.

of being trapped. It is expected that a stronger relative deregulation of temporary employment increases the risk of employees being trapped in temporary employment (Gebel & Giesecke, 2011).

Additionally, this chapter assesses the implications of numerical flexibility for employees' risk of future numerical flexibility and unemployment. Finding an increased risk of future numerical flexibility and unemployment for currently numerically flexible employees would provide evidence on the link between numerical flexibility and unemployment risks, which was in Chapter 2 proposed to be essential to precarious employment. Results from this chapter indeed show that temporary employees have an increased risk of future temporary employment as compared to permanent employees, as well as an increased risk of future unemployment. Although EPL is shown to be associated with a higher risk of temporary employment and thus a larger labour market periphery, EPL characteristics do not influence state dependency in temporary employment on the individual level.

4.2. Theoretical framework

4.2.1 Institutions and inequalities in employees' risk of temporary employment

Many scholars have observed the existence of skill-based inequalities in the risk of temporary employment. In 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) findings on labour market segmentation in Spain. These findings also 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 to present somewhat of a different case, as individuals with a tertiary education appear to be at the greatest risk of temporary employment when entering the labour market, and later on, are no more likely to receive a stable contract (Barbieri & Scherer, 2009). Moreover, cohort effects on the risk of temporary employment are quite strong in both Italy and Spain (Barbieri & Scherer, 2009; Golsch, 2003). Presumably, it were these findings that led Barbieri (2009) to propose that inequality in job security and wages is mainly skill-driven in the Northern and Continental institutional clusters, whereas it is age-driven in the Anglo-Saxon and Mediterranean countries (Barbieri, 2009).

A number of explanations have been offered for the advantages highly skilled individuals have over low-skilled peers. Human capital theory proposes

that the increased productivity resulting from increased investments in education generates higher rewards in the labour market for the high educated (Becker, 1964), while the inelasticity of the supply of highly educated employees adds to this effect by making the highly educated difficult to replace. Moreover, positional good theory proposes higher rewards for the highly educated as a result of their increased trainability (Thurow, 1975), whereas closure theory proposes that employees in closed occupations can extract rents to increase their returns to education (Bol & Van de Werfhorst, 2011). These rewards might translate into increased job security (De Vries & Wolbers, 2005) and the strength of the mechanisms increasing job security for the high skilled may vary with the institutional environment (Bol, 2013).

To reduce transaction costs employers incorporate employees in jobs that require firm-specific human capital and are difficult to monitor into the organisational hierarchy (Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003). This was argued and shown in Chapter 1 and Chapter 3. Building on these explanations, Polavieja (2003) proposed that employers make the use of temporary contract conditional on the skill content of the job for which they seek to hire. In response to Polavieja (2003), Gebel and Giesecke (2011) propose that the strength of these transaction cost mechanisms is influenced by the difference between the protection of temporary and permanent contracts. Indeed, they find support for this proposition in a study that uses European Labour Force Data for 15 European countries over the period 1992-2007 (Gebel & Giesecke, 2011).

This chapter expands on the 2011 study by Gebel & Giesecke, in which they assess whether the differentiation in the protection of temporary and permanent contracts increases low-skilled employees' risk of being employed on a temporary contract (Gebel & Giesecke, 2011). In that study, the authors use educational attainment as their main independent variable, which serves as a proxy for the degree to which employees' skills are firm-specific, and the degree to which employees' performance is difficult to monitor. Though expectedly by necessity, using educational attainment as the main variable makes the results ambiguous. Do employers' contract decisions follow from their assessment of the employee's educational attainment? Or do employers' contract decisions follow from the transaction costs associated with the job for which they wish to hire an employee? Since job and employee characteristics are likely confounded, using an indicator of the former and not the latter as an independent variable does not allow for a proper identification of the underlying mechanism. This chapter expands on Gebel and Giesecke's 2011 study by focusing more directly on the transaction cost mechanisms underlying their framework, and testing their strength compared to that of explanations based on employees' educational attainment. In studying transaction costs with a different dataset and different indicators, this chapter complements Chapter 3. Additionally, this chapter extends the study of the influence of EPL on employees' cross-sectional risk of temporary employment, to the longitudinal risk of employment insecurity as a result of alternating numerical

flexibility with unemployment. Here, this chapter links to the conceptualisation of precarious employment, as proposed in Chapter 2.

4.2.2. Transaction costs and the risk of temporary employment

Following the theoretical framework in Chapter 1 and the outline in Chapter 3, two mechanisms that drive segmentation by type of contract are proposed: the autonomy mechanism and the skill specificity mechanism. These are referred to as the incentive mechanism and the buffer mechanism respectively, by Gebel and Giesecke (2011) and Polavieja (2005). The autonomy mechanism follows from the proposition (advanced in Chapters 1 and 3) that as jobs become increasingly complex and more difficult to circumscribe, the employees performing them become increasingly difficult to monitor and thus operate under increasing autonomy (Goldthorpe, 2000). As outlined in Chapter 1 and 3, this increase in autonomy is expected to result in an increased probability of the employee being offered a permanent contract to overcome principal-agent problems, and thus a decreased probability of them being offered a temporary contract. Hypothesis 1a is thus proposed.

H1a: The more autonomy is required to perform a job, the less likely it is that the employee performing the job has a temporary contract.

To avoid having to dismiss permanent employees when product markets are volatile, employers use temporary contracts to hire employees whom they can dismiss on relatively short notice (Gebel & Giesecke, 2011; Polavieja, 2003). With this goal in mind, employers prefer to use temporary contracts to hire workers whose replacements costs are low as a result of the characteristics of their job, since this reduces total replacement costs. Whether employees can be readily replaced by alternatives in the external market is influenced by the degree of firm-specific human capital their jobs require (Goldthorpe, 2000). As outlined in Chapters 1 and 3, a high level of firm-specific skills makes replacing an employee costly for the employer, which results in a decreased probability of temporary employment for employees with high levels of firm-specific skills. Consequently, hypothesis 1b is proposed.

H1b: The higher the degree of firm-specific skills required to perform a job, the less likely it is that the employee performing the job has a temporary contract.

Note that Chapter 3 proposed a negative relation between job complexity and employees' risk of numerical flexibility, which was supposed to result from the implications job complexity has with regard to autonomy and skill specificity. In this chapter, the relation between autonomy and skill specificity, and numerical flexibility is explicitly formulated and tested directly. Together, the results from Chapter 3 and 4 illuminate different elements of the same transaction cost

mechanism running from job complexity through autonomy and skill specificity to numerical flexibility.

Temporary and permanent contracts have different implications for potential future procedural costs for employers. These costs should be understood as procedural costs resulting from legal barriers to hiring, limitations to repeated and proper use in the case of temporary contracts, and legal barriers to dismissing employees in the case of permanent contracts. Temporary contracts generally imply lower procedural costs than permanent contracts. However, permanent contracts generally imply benefits in terms of productivity and the binding of employees to the organisation (which increases future productivity), and these benefits are here assumed to increase as the protection of permanent contracts increases. Since increasingly protected employees are assumed to feel more committed to the organisation as the protection of their contract increases, they should be more productive and less likely to leave the organisation. Conversely, temporary contracts imply costs resulting from suboptimal productivity or foregone productivity, and these costs are assumed to increase as the protection of temporary employment decreases. As their contracts become less protected, employees are increasingly marginally attached to the organisation, and more likely to shirk and/or leave. Since the procedural costs of temporary and permanent contracts differ between institutional environments, the strength of the autonomy and skill specificity mechanism are expected to differ between institutional environments as well.

It is proposed that employers change their hiring behaviour when the procedural costs of a temporary contract (EPLt) decrease relative to those of a permanent contract (EPLp). Specifically, when EPLp increases or EPLt decreases, employers transfer employees to temporary contracts if 1) the resulting decrease in procedural costs minus the increase in losses in terms of productivity, is larger than 2) the increase in benefits resulting from a permanent contract in terms of productivity minus the increase in procedural costs of a permanent contract. This is outlined in more detail in Appendix B. Specifically, in countries with high EPLp, decreasing EPLt implies large savings in terms of procedural costs for temporary contracts, while it simultaneously implies large productivity benefits for permanent contracts. For low autonomy and skill specificity, this implies employers transfer permanent employees to temporary contracts, since here the savings on procedural costs outweigh any productivity losses. Conversely, for high autonomy and skill specificity, productivity gains of permanent employment increasingly outweigh the procedural benefits of temporary employment, so employers increasingly transfer temporary employees to permanent contracts. In low EPLp countries, a decrease in EPLt implies limited savings on procedural costs for temporary employees and limited productivity gains for permanent employees. As a consequence, in these countries employers are expected to make their decisions with regard to temporary and permanent contracts less conditional on employees' level of autonomy and skill specificity.

H2a: The negative relationship between autonomy and the risk of temporary employment is stronger in environments where the difference between EPLp and EPLt is large, compared to environments where the relative difference between EPLp and EPLt is small.

H2b: The negative relationship between skill specificity and the risk of temporary employment is stronger in countries where the difference between EPLp and EPLt is large, compared to countries where the relative difference between EPLp and EPLt is small.

4.2.3. Educational attainment as an alternative mechanism

Skill specificity and autonomy are essentially rooted in characteristics of the job, rather than based on employees' skills. In response to Gebel & Giesecke's (2011) findings, educational attainment should be assessed as a skill-based predictor of inequalities in type of contract. High-educated employees are expectedly more costly to replace than low-educated employees, because of the inelasticity of the supply of highly educated labour, and because employers cannot easily redefine jobs to accommodate educational mismatches. Under these conditions, search costs are involved in replacing employees, and vacancy periods likely lead to lost productivity. More explicitly, when an undersupply of individuals at the high end of the educational distribution exists, employers incur costs when replacing highly educated employees. This has been referred to as the "congestion effect" (Andrews, Bradley, Stott, & Upward, 2008). Even without educational mismatches, new-employee recruitment occurs under incomplete information, which requires the employer to invest in screening prospective employees' trustworthiness and productiveness (Schram, Brandts, & Gërxhani, 2010). Because the costs of improper screening likely increase with a job's skill level, screening costs may increase with educational attainment. At any rate and whatever their source, the high replacement costs of highly educated employees trigger employers' transaction cost considerations, which were outlined in the previous section. This yields hypothesis 3a and hypothesis 3b:

H3a: The higher an employee's educational attainment, the less likely it is that the employee has a temporary contract.

H3b: The negative relationship between education and the risk of temporary employment is stronger in environments where the difference between EPLp and EPLt is large, compared to environments where the relative difference between EPLp and EPLt is small.

Given their comparable nature, the independence of the education, the skill specificity, and the autonomy mechanisms should be tested. Gebel & Giesecke (2011) use education as a proxy for transaction cost arguments because they

expect these to be related. Indeed, it seems likely that higher educated individuals will on average require more autonomy and will be more difficult to monitor as a result of the complexity of their jobs (see Chapter 3, and: Campbell, 1988; Goldthorpe, 2000). However, autonomy may follow from the degree of complexity associated with the job, but may also follow employers' ideas with regard to proper management of employees: employers may prefer to grant autonomy because they do not like the idea of constantly monitoring their employees, or because they feel that autonomy induces a sense of responsibility and commitment. This relation may be skewed towards employers working with high educated employees, but is not determined by educational attainment. Similarly, firm-specific tasks may often have some degree of complexity, but complex tasks are not at all necessarily firm-specific. A case in point would be Williamson's (1981) example of surgery, which is a complex task by any measure, but is not strongly specific to the hospital it is performed in. Given this non-shared variance the proposed mechanisms are expectedly independent. This yields hypothesis 3c.

H3c: H2a and H2b hold when the interaction between educational level and the relative difference between the EPL for temporary and permanent contracts is controlled for.

4.2.4. Temporary employment as a trap

Many scholars observe the tendency of temporary employment to "trap" individuals, conceptualised as them having an increased risk of future temporary employment (Booth, Francesconi, & Frank, 2002; Gash, 2008; Giesecke & Gross, 2003). A trapping effect of temporary employment would imply lower mobility and increased financial risk for trapped individuals. As a general pattern, transition rates from temporary employment to permanent employment are especially low in Southern European and Continental countries, which provides support for the theory of insider/outsider labour markets (Lindbeck & Snower, 1988; Muffels & Luijkx, 2008). For male employees, Muffels & Luijkx (2008) show that upward mobility out of flexible employment is most unlikely in Southern European institutional regimes, specifically for the low educated. They attribute this to the relative absence of Active Labour Market Policies (ALMP) and a combination of strict regulation for the dismissal of employees on permanent contracts and a leniency towards the use and dismissal of temporary employees (the previously discussed EPLp/EPLt differences). Corroborating Muffels & Luijkx' (2008) findings for Italy, Berton et al (2011) find that temporary contracts are most likely in the near future for employees employed on temporary contracts in the present, which is consistent with Scherer's (2004) results. Moreover, the trapping effect of temporary employment has been confirmed in a number of continental countries, such as France (Blanchard & Landier, 2002) and Germany (Giesecke & Gross,

2003). Compared to Southern European and Continental countries, Muffels & Luijkx (2008) find stronger mobility in Northern, and, in line with Booth et al (2002), Anglo-Saxon institutional regimes, though even in the latter temporary employment expectedly has some trapping qualities (Giesecke & Gross, 2003). Though Muffels & Luijkx (2008) do not link transitions rates from temporary employment into permanent employment empirically directly to differences in the institutional protection of these contracts, this relation is expected to exist (see for instance: Amuedo-Dorantes, 2000; Gebel & Giesecke, 2011).

Employees with higher transaction costs and a high level of educational attainment essentially have higher replacement costs than employees who score lower on these dimensions (Andrews, Bradley, Stott, & Upward, 2008; Baron & Bishop, 1985; Goldthorpe, 2000). These higher replacement costs allow these employees to bargain for increased employment security through permanent contracts at the expense of peers with lower replacement costs, as proposed by insider/outsider theory (Lindbeck & Snower, 1988). Moreover, following the previous sections and Chapter 3, employers have a rational interest in tying employees with high replacement costs to the company so as to lower the risk of these employees leaving, and simultaneously have an interest in allowing themselves the flexibility of dismissing employees with low replacement costs, by employing them on temporary contracts (Emmenegger, 2009; Gash, 2008; Gebel & Giesecke, 2011; Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003; Polavieja, 2003). As such, both through the proposed job-driven replaceability mechanisms and employee-driven insider/outsider mechanisms, a segmentation of the labour market into a well-protected, permanently employed core, and a less protected temporarily employed periphery is expected (Piore & Sabel, 1984). Indeed, the job-level explanations rooted in transaction cost theory resonate with the propositions of dual-labour market theory, which argues that it is predominantly characteristics of the job that separate the labour market's core from its periphery. Assuming a fixed number of jobs in the core of the labour market and the explained low turnover in the core, it follows that employees on permanent contract, i.e. core employees, have a high chance of future permanent employment, whereas temporary employees, i.e. peripheral employees, have a high risk of future temporary employment. Consequently, hypothesis 4a should hold:

H4a: Across institutional settings, employees employed on a temporary contract at t-1 are more likely to be employed on a temporary contract at t, than employees employed on a permanent contract at t-1.

Since repeated temporary contracts are likely to interspersed with unemployment, hypothesis 4b should hold as well.

H4b: Across institutional settings, employees employed on a temporary contract at t-1 are more likely to be unemployed at t, than employees employed on a permanent contract at t-1.

Following from the discussion in section 4.2.2, it is expected that as the relative deregulation of temporary employment increases, permanent contracts become more and more concentrated amongst employees with high autonomy, high skill specificity and a high level of educational attainment. Defining replacement costs as 1) replacement costs inherent to the job and the employee, i.e. related to skill specificity and educational attainment (Andrews, Bradley, Stott, & Upward, 2008; Baron & Bishop, 1985; Goldthorpe, 2000; Williamson, 1981), plus 2) replacement costs generated by the protection of the specific type of contract (EPLp and EPLt), this concentration of permanent contracts in the core *ipso facto* means that replacement costs in the core increase, making transitions from the periphery to the core more unlikely. These increasing costs increase the proportion of employment relations for which the gains of offering a permanent contract are less than the costs of offering that contract. Consequently, less permanent contracts are offered and, cross-sectionally, the size of the labour market's periphery grows relative to its core. Longitudinally, increasingly few employees will be offered a permanent contract upon entering the company or being offered one after finishing a temporary contract, and more employees exit into unemployment after a number of temporary contracts (Polavieja, 2003).

H4c: The positive relationship between temporary employment at t-1 and the risk of temporary employment at t is stronger in environments where the relative difference between the procedural costs associated with temporary and permanent contracts is larger.

H4d: The positive relationship between temporary employment at t-1 and the risk of unemployment at t is stronger in environments where the relative difference between the procedural costs associated with temporary and permanent contracts is larger.

4.3. Method

4.3.1 Data

Hypotheses 1a to 3c 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). A sample of 22 European countries¹³ is used to test the

¹³ Austria (AT), Belgium (BE), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Ireland (IE), Italy (IT), Luxembourg (LU), the Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), United Kingdom (UK).

hypotheses. Since Austria, Italy and Luxembourg 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 41 country-years and, after all the controls are added, observations on 22,148 employees. Additionally, for testing hypotheses 1a-4b, data on Employment Protection Legislation is obtained from the OECD Employment database (OECD, OECD Online Employment Database, 2012). It should be noted that Gebel & Giesecke (2011), the main source for this part of the chapter, use the European Union Labour Force Survey (EU-LFS) for their analysis. This allows them to observe countries for a longer period of time and to rely on within country-variation in EPL to test their proposed mechanisms, which, given the dynamic nature of the mechanisms, is the preferable strategy. Though only two waves and thus limiting within-country variation in EPL, compared to the EU-LFS, the ESS has the advantage of containing variables much more suitable to measuring the transaction cost elements of these mechanisms. Consequently, compared to the study of Gebel & Giesecke (2011), within-country variation is here sacrificed in exchange for more valid independent variables.

Hypotheses 4a to 4d are tested using data from the European Union Statistics on Income and Living Conditions (EU-SILC). EU-SILC is a longitudinal dataset covering the 2004 – 2009 period, with full coverage of the 25 EU member states plus Norway and Iceland from 2005 on. Due to the rotating panel design, the study tracks individuals over a maximum of four years, and covers themes such as individuals' social economic background, careers, and general health and wellbeing. Additionally, the study tracks the household in which individuals are nested, by incorporating all members of the household into the study and recording variables on the household level, such as disposable income, expenses and housing conditions. Since Germany, Denmark and Luxembourg do not have sufficient data on temporary employment to assess dynamics over time, hypothesis 4a to hypothesis 4d are tested using a sample of 20 countries¹⁴, and 129,559 employees nested in those countries. It should be noted that the rotating panel design of EU-SILC makes it impossible to observe individuals for longer than 4 years and thus forces the analysis to rely on individuals with relatively dynamic careers. Additionally, since the models already use two waves for the analysis of the main variables, it is not possible to account extensively for individuals' employment history. These issues should be kept in mind when interpreting the results. On the other hand, the rotating panel design lessens the risk of selective attrition biasing the results and allows for a large number of observations at relatively short intervals.

¹⁴ Austria (AT), Belgium (BE), Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Greece (GR), Hungary (HU), Iceland (IL), Ireland (IE), Italy (IT), the Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), United Kingdom (UK).

4.3.2 *Operationalisation: dependent variables*

The dependent variable of interest for hypothesis 1a to 3c is taken from the ESS and indicates whether an employee was employed on a contract of limited (temporary) or unlimited (permanent) 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 were dropped from the dataset, which leaves 22,148 employees of which 87% with permanent jobs and 13% with temporary contracts. 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 temporary contracts and employment-agency employment. Consequently, scores on the EPLT indicator may be the same for two countries, but be driven by different scores on the underlying regulation of fixed term contracts offered by the daily employer and the use of employment agencies. Since it is unobserved in ESS who offers the fixed term contract, i.e. the daily employer or an agency, the effect of these differing regulations regarding the protection of temporary employment is not accounted for. As is shown in Chapter 5 however, temporary employment is more common than agency employment and expectedly dominates the analysis here. This limits the noise introduced by agency employment

To test the trapping effect of temporary employment (hypothesis 4a and 4b), two variables from EU-SILC are used as dependents. The first dependent variable indicates whether an individual is employed on a temporary contract: it is recorded whether the respondent is employed on a permanent contract (0), or is employed on a temporary contract (1). Using the lag of temporary employment as the independent variable, it is essentially assessed to what extent the risk of current temporary employment is influenced by past temporary employment (see also: Gash, 2008). For an account of precarious employment, a second analysis assesses the effect of temporary employment on the probability of future unemployment. This is measured using a second variable, that indicates whether an individual is employed on either a temporary or permanent contracts, or is unemployed “unemployed and actively looking for a job” (1).

The distribution of the proportion of temporary employees across countries is generally similar in the ESS and in EU-SILC: Spain, Poland, Greece, Finland and Portugal are consistently in the top 5 of countries with high levels of temporary employment, whereas the United Kingdom and Austria are consistently at the low end. What stands out however, is the difference in absolute levels of temporary employment between the ESS and EU-SILC: in the former, proportions are

consistently 5 percent point higher than in the latter. Since the questions asked in the respective surveys are similar, this likely results from the longitudinal structure of the EU-SILC, which is vulnerable to attrition amongst temporary employees. Indeed, closer analysis of the attrition rates of temporary employees reveals that temporary employees have 6,5% higher attrition than permanent employees in EU-SILC, i.e. the mean number of waves temporary employees are present in the dataset is 6% lower than permanent employees. Since the most likely drop-outs are temporary employees who did not move into permanent employment, attrition amongst temporary employees likely causes an underestimation of the trapping effect of temporary employment. Moreover, there are some country differences in attrition rates, but rates generally fall between the 2.5% and 10.5%, as indicated by a standard deviation of 4%. However, there is no significant correlation between these attrition rates and country-level institutional characteristics of interest here. The proportion of temporary employment per country as recorded in the ESS and EU-SILC are shown in Figure C.1 and Figure C.2 in Appendix C.

4.3.3 Operationalisation: individual level independent variables

Autonomy is measured through the question: “how much allows management at your work you to decide how your own daily work is/was organized?”. The possible answers ranged from 1 “I have/had no influence” to 10 “I have/had complete control”. The density distribution of autonomy per country is shown in Figure C.3 in Appendix C. The distribution of autonomy is relatively flat for de Southern European countries and distributions, while clustering at the high-autonomy end of the spectrum is shown for Northern Europe. In part, this reflects the distribution of occupational levels across countries: the Northern European countries have more employees in occupations on the high- technical and professional level, whereas in the Southern and Eastern European countries this distribution is less skewed towards high-level occupations (see Figure D.2 in Appendix D). Indeed, mean autonomy per occupation level increases monotonously, and autonomy shows a correlation of 0.35 with occupation level. There is some variation in this correlation over countries, but the country-level standard deviation of 0.06 is modest. This consistent relation to occupation reduces potential concerns about the measures’ subjectivity. Additionally, it is likely that the differences between countries are in part explained by differences in management styles, specifically the degree to which management is inclined to grant autonomy to employees. Though not measuring autonomy per se, Bloom & Van Reenen (2010) for instance show that there exists marked differences in management styles across countries, and that Southern European countries tend to occupy a separate cluster of management styles as compared to Northern European and Anglo-Saxon countries. Likely thus, a large proportion of between

country differences in scores on the autonomy variable is due to unobserved differences between countries, rather than to inconsistency of the measure.

Skill specificity 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. It is argued that the time it would take for a potential replacement to do an employee’s job properly adequately measures the extent to which human capital is acquired on the job, and indicates the extent to which replacing the employee would mean foregoing output for the employer. This seems a valid indicator given the discussion on skill specificity in the theoretical section. In Figure C.4 in Appendix C, the density distribution of skill specificity is shown per country: skill specificity seems to be normally distributed and in a similar way for all countries, with a modest right skew in some Northern European countries as compared to Southern and Eastern European countries. Skill specificity has a mean correlation of 0.30 with occupational level, with a country-level standard deviation of 0.07. Additionally, the degree of skill specificity is relatively high for crafts and trades employees, which is not necessary expected based on their occupation level, but more so on the basis of the content of their job. This reinforces the indicator’s validity.

Education is measured on an adapted ISCED scale: 1) “less than lower secondary education (ISCED 0-1)”, 2) “lower secondary education completed (ISCED 2)”, 3) “upper secondary education completed (ISCED 3)”, 4) “post-secondary non-tertiary education completed (ISCED 4)”, 5) “tertiary education completed (ISCED 5-6)”. The distribution of educational attainment by country is shown in Figure C.5 in Appendix C. Though there are some country differences, as a general pattern in most countries the highest density is found in ISCED level 3, followed by levels 5-6 and level 3. The indicator consequently seems consistent across countries. Additionally, the pairwise correlations with skill specificity and autonomy are modest, as proposed in the theoretical section and shown in Table C.1 in Appendix C.

Whether temporary employment can be considered a trap (hypothesis 4a to hypothesis 4d) is measured by looking at the strength of the relation between past temporary employment and future temporary employment, i.e. the state dependency of temporary employment, or past temporary employment and future unemployment. To measure these trapping effects, the first lag of temporary employment in EU-SILC is used as the dependent variable, i.e. temporary employment in wave $x-1$. Transitions between employment states are shown in Table 4.1. Table 4.1 immediately shows a tendency of temporary employees to be employed on a temporary contract in the subsequent year, with a stronger risk of unemployment as compared to permanent employees as well.

However, this could be due to compositional factors such as educational attainment and occupation.

Table 4.1: Aggregate employee moves between employment states in Europe, 2004-2009 (source, EU-SILC).

	Permanent contract (t)	Temporary contract (t)	Unemployment (t)
Permanent contract (t-1)	133,868 (95.51%)	3,742 (2.67%)	2,557 (1.82%)
Temporary contract (t-1)	5,902 (32.33%)	10,509 (57.57%)	1,844 (10.10%)
Unemployment (t-1)	2,296 (16.63%)	2,829 (20.50%)	8,678 (62.87%)

4.3.4 Operationalisation: country-level independent variables

The protection of permanent contracts (EPLp) and the protection of temporary contracts (EPLt) are measured with the OECD indicators for employment protection legislation, which can range from 0 to 6. Scores on EPLp in the sample range from 1.20 (UK, 2004/2010) to 4.42 (PT, 2004), while scores on EPLt range from 0.38 (UK, 2004/2010) to 3.63 (FR, 2004/2010). The country scores on the EPLp and EPLt variable for the years 2004-2010 are shown in Figure C.6 in Appendix C. In the observed period, four countries decreased the relative regulation of temporary employment, namely Sweden, Portugal, Belgium and Spain. This partly reflects Barbieri's (2009) assertions that in corporatist and Mediterranean welfare states policies aim to facilitate labour market adjustment through a flexible stock of atypically employed employees, whereas policies in Anglo-Saxon welfare states (and Denmark) facilitate adjustment through wage flexibility. Indeed, the relative deregulation that has taken place in Portugal, Belgium and Spain supports these assertions, as does the lack of deregulation in the UK, Ireland and Denmark. Additionally, these different approaches to labour market adjustment are reflected in the high differences between EPLp and EPLt in the Netherlands, Germany, Portugal and Austria, and the small differences in the UK, Ireland and Denmark.

The difference between the protection of permanent and temporary employment is measured by assessing variation in EPLt and EPLp separately, and variation in EPLt in different EPLp environments. Consequently, the models contain three-way-interactions between EPLp, EPLt, and skill specificity, autonomy or education. Though the overall analytical strategy is similar, the strategy with regard to the independent variables differs somewhat from Gebel & Giesecke's (2011). They dichotomise their EPLp variable to indicate high EPLp and low EPLp environments, separated by median EPLp. Since this strategy unnecessarily decreases the variance in EPLp, the continuous version of the variable is used here. Additionally, Gebel & Giesecke (2011) use approach in which

they first run within country regression of education on temporary employment, followed by a regression of a high-EPLp*EPLt interaction on the country-coefficients of education obtained in the first step. Here, multilevel models are used to capitalize on the full range of nested variation in the relation between the dependent and independent variables. To facilitate interpretation of the results when significant, predicted probabilities of temporary employment are calculated for employees with different level of skill specificity and autonomy, in different EPLp/EPLt environments.

4.3.5 Estimation strategy

Hypotheses 1a-3a are tested using multilevel logit models (individuals nested in countries) with dummies for the year of the survey and fixed country effects. This modelling strategy allows for a strong test of non-linearity in the skill specificity, autonomy and education effects across levels of EPLp and EPLt. An initial Model 1a was specified to estimate the linear effects of skill specificity, autonomy and education on the probability of being employed on a temporary contract. This model links the analysis to the propositions advanced in Chapter 3. In Models 1b, 1c and 1d the cross-level interaction between autonomy, EPLp, EPLt and EPLp*EPLt were added to 1a, and similarly with skill specificity in Models 1e, 1f and 1g. The full modelling strategy is shown in below.

In these models, $\Pr(\text{tempjob}_{ij}=1)$ refers to the probability that individual i in country j is employed on a contract of limited duration. Moreover, specificity_{ij} and autonomy_{ij} refer to that individual's response to the respective questions, whereas edu_{ij} refers to that individual's level of education attainment. $(\text{EPLp}_j * \text{EPLt}_j)$ indicates the difference between the protection of temporary and permanent employment in country j , whereas $D:\text{country}_j$ refers to a dummy for country j . Finally, $(\sum \beta_n x_{nij})$ refers to a vector of n covariates for individual i in country j . This vector contains socio-demographic variables such as gender and age, employment and job variables such as occupation, whether the employee had ever been unemployed for a period of three months or more, whether the employee was covered by a union, and the number of employees in the company in which they work, along with the sector of economic activity. On the country-level, the models contain controls for GDP growth in the three years prior to the survey, the unemployment rate, and the change in unemployment in the three years prior to the survey, which should provide an indication of the economic context. Some descriptive statistics are provided Appendix D. The models were estimated using the subsample of individuals in employment, while Individuals who were either self-employed, working for their family businesses were excluded, or were employed in the armed forces were removed from the sample.

Model 1a:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1(\text{autonomy}_{ij}) + \beta_2(\text{specificity}_{ij}) + \beta_3(\text{edu}_{ij}) + \beta_4(\text{EPLt}_i) \\ + \beta_5(\text{EPLp}_j) + \beta_6(D:\text{country}_j) + \beta_7(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 1b:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1((\text{autonomy}_{ij}) * (\text{EPLp}_j)) + \beta_2(\text{specificity}_{ij}) + \beta_3(\text{edu}_{ij}) \\ + \beta_4(\text{EPLt}_i) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 1c:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1((\text{autonomy}_{ij}) * (\text{EPLt}_i)) + \beta_2(\text{specificity}_{ij}) + \beta_3((\text{edu}_{ij}) \\ + \beta_4(\text{EPLp}_j) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 1d:

$$\Pr(\text{tempjob}_{ij} = 1)_{ij} = \alpha + \beta_1((\text{autonomy}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_i)) + \beta_2(\text{specificity}_{ij}) \\ + \beta_3((\text{edu}_{ij}) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 1e:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1((\text{specificity}_{ij}) * (\text{EPLp}_j)) + \beta_2(\text{autonomy}_{ij}) + \beta_3(\text{edu}_{ij}) \\ + \beta_4(\text{EPLt}_i) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 1f:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1((\text{specificity}_{ij}) * (\text{EPLt}_i)) + \beta_2(\text{autonomy}_{ij}) + \beta_3((\text{edu}_{ij}) \\ + \beta_4(\text{EPLp}_j) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 1g:

$$\Pr(\text{tempjob}_{ij} = 1)_{ij} = \alpha + \beta_1((\text{specificity}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_i)) + \beta_2(\text{autonomy}_{ij}) \\ + \beta_3((\text{edu}_{ij}) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

An estimated empty model had an ICC of just 0.04, which indicates that a multilevel strategy might be redundant. However, in a preliminary estimation of Model 1a with random slopes, the slopes of skill specificity and education show a country-level standard deviation of respectively 15% and 50% of the coefficient, although the slope for autonomy did not vary across countries. Consequently, using a multilevel strategy with random slopes and cross-level interactions seems the appropriate approach.

Model 2a:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1(\text{autonomy}_{ij}) + \beta_2(\text{specificity}_{ij}) + \beta_3(\text{edu}_{ij}) + \beta_4(\text{EPLt}_j) + \beta_5(\text{EPLp}_j) + \beta_6(D:\text{country}_j) + \beta_7(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 2b:

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1(\text{specificity}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_j) + \beta_2(\text{autonomy}_{ij}) + \beta_3(\text{edu}_{ij}) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 2c

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1(\text{edu}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_j) + \beta_2(\text{specificity}_{ij}) + \beta_3 \text{autonomy}_{ij} + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 2d

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1(\text{edu}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_j) + \beta_2((\text{autonomy}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_j)) + \beta_3(\text{specificity}_{ij}) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

Model 2e

$$\Pr(\text{tempjob}_{ij} = 1) = \alpha + \beta_1(\text{edu}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_j) + \beta_2(\text{specificity}_{ij}) * (\text{EPLp}_j) * (\text{EPLt}_j) + \beta_3(\text{autonomy}_{ij}) + \beta_5(D:\text{country}_j) + \beta_6(D:\text{ESSround}_{ij}) + \left(\sum \beta_n x_{nij}\right) + \varepsilon_{ij}$$

To test hypothesis 3b and hypothesis 3c, a second set of multilevel logit models is estimated, again with country and time fixed effects. In Model 2a and 2b, the autonomy and skill specificity mechanisms are estimated for reference, identical to Models 1d and 1g. To assess hypothesis 3b and to check the consistency of the results in this chapter to Gebel & Giesecke's (2011), the cross-level interaction between the relative regulation of temporary employment (EPLp*EPLt) and education is estimated in Model 2c, including the main effects. In Model 2d, both the effect of the relative regulation of temporary employment on the autonomy and education mechanisms are estimated, to assess the extent to which these mechanisms are confounded. This is done again for the skill specificity mechanism in Model 2e. These models contain the same covariates as Models 1a-1g. Since the model estimates the dynamic effect of temporary employment, the initial condition is controlled for¹⁵. Moreover, country dummies

¹⁵ The probable endogeneity of the initial condition of y , resulting in part from the arbitrary starting point of a longitudinal sample, introduces a bias with respect to the observed relation between $y-1$ and y . Wooldridge (2005) showed that, for probit, tobit and poisson regression, controlling for the initial condition removes this endogeneity.

fix the country effect and isolate the non-linearity in the effect of temporary employment resulting from variation in EPLp/EPLt differences.

Model 3a

$$\Pr(\text{tempjob}_{ijk} = 1) = \alpha + (l.\text{tempjob}_{ijk}) + (\text{tempjob0}_{jk}) + (D:\text{country}_k) + \left(\sum \beta_l x_{l,ijk}\right) + \left(\sum \beta_l \bar{x}_{l,ijk}\right) + \varepsilon_{ijk}$$

Model 3b

$$\Pr(\text{tempjob}_{ijk} = 1) = \alpha + (l.\text{tempjob}_{ijk} * (EPLp_k) * (EPLt_k)) + (\text{tempjob0}_{jk}) + (D:\text{country}_k) + \left(\sum \beta_l x_{l,ijk}\right) + \left(\sum \beta_l \bar{x}_{l,ijk}\right) + \varepsilon_{ijk}$$

Model 3c

$$\Pr(\text{unemp}_{ijk} = 1) = \alpha + (l.\text{tempjob}_{ijk}) + (\text{tempjob0}_{jk}) + (D:\text{country}_k) + \left(\sum \beta_l x_{l,ijk}\right) + \left(\sum \beta_l \bar{x}_{l,ijk}\right) + \varepsilon_{ijk}$$

Model 3d

$$\Pr(\text{unemp}_{ijk} = 1) = \alpha + (l.\text{tempjob}_{ijk} * (\text{highEPLp}_k * \text{negEPLt}_k)) + (\text{tempjob0}_{jk}) + (D:\text{country}_k) + \left(\sum \beta_l x_{l,ijk}\right) + \left(\sum \beta_l \bar{x}_{l,ijk}\right) + \varepsilon_{ijk}$$

To test H4a-d. four models are formulated: Model 3a estimates the effect of the lag of temporary employment on the probability of temporary employment as compared to permanent employment, and 3b the interaction with the relative deregulation of temporary employment. Model 3c estimates the effect of the lag of temporary employment on the probability unemployment, and 3d the interaction with the relative deregulation of temporary employment. In Models 3a and 3b, $\Pr(\text{tempjob}_{ijk}=1)$ refers to the probability that individual i in country k at time j is employed on a contract of limited duration and $l.\text{tempjob}_{ijk}$ is the independent variable of interest, namely the lag of temporary employment. Moreover, the initial condition of the tempjob variable is added as tempjob0 . Finally, a vector of covariates and their mean values is added, to control for working hours, time spent in the labour market, age, gender, skill level, household income, household size, and marital status. Model 3b then adds the cross-level interaction with high EPLp and the deregulation of EPLt to the model. In Models 3c and 3d, $\Pr(\text{unemp}_{ijk}=1)$ refers to the probability that individual i in country k at time j is employed on a contract of limited duration. Otherwise, Models 3c and 3d are identical to Models 3a and 3b.

4.4. Results

4.4.1. EPL and job-based risks of temporary employment

Table 4.2 shows the results from Models 1a-1g. By showing that autonomy, skill specificity and education are negatively related to the risk of a temporary contract, the results from Model 1a provide support for hypothesis 1a, 1b and 3a, and by extension for the propositions in Chapter 3.

Table 4.2: Results from Models 1a-1g, estimating the effect of EPLp and EPLt on the autonomy and specificity mechanism (source: ESS, round 2 and 5).

	(1a)	(1b)	(1c)	(1d)	(1e)	(1f)	(1g)
	Temp. contract	Temp. contract	Temp. contract	Temp. contract	Temp. contract	Temp. contract	Temp. contract
Autonomy	-0.039*** (-5.91)	0.017 (0.73)	-0.015 (-1.19)	0.053 (1.68)	-0.038*** (-5.76)	-0.039*** (-6.00)	-0.039*** (-5.84)
Skill specificity	-0.168*** (-8.53)	-0.168*** (-8.60)	-0.169*** (-8.63)	-0.169*** (-8.65)	0.0745 (0.81)	-0.0985 (-1.78)	0.278 (1.96)
Education	-0.0894* (-2.25)	-0.0904* (-2.31)	-0.0905* (-2.30)	-0.0918* (-2.37)	-0.0935* (-2.44)	-0.0898* (-2.29)	-0.0944* (-2.48)
EPLp	1.348*** (4.13)	1.444*** (4.40)	1.358*** (4.19)	1.712** (2.79)	1.719*** (4.16)	1.344*** (4.19)	2.187** (2.95)
EPLt	0.0830 (1.30)	0.0853 (1.33)	0.153* (2.06)	0.540 (1.07)	0.0839 (1.27)	0.244* (2.12)	0.972 (1.52)
EPLp*EPLt				-0.127 (-0.93)			-0.292 (-1.50)
Autonomy*EPLp		-0.0230* (-2.33)		-0.0304* (-2.01)			
Autonomy*EPLt			-0.0143* (-2.28)	-0.0293 (-1.75)			
Autonomy*EPLp*EPLt				0.00730 (1.03)			
Skill specificity*EPLp					-0.101** (-2.78)		-0.170** (-2.86)
Skill specificity*EPLt						-0.0425 (-1.72)	-0.166** (-2.64)
Skill specificity*EPLp*EPLt							0.0578* (2.15)
N	22148	22148	22148	22148	22148	22148	22148

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Model 1b provides support for the proposition that the autonomy mechanism is stronger in countries where the difference between the protection of temporary and permanent employment is larger: an increase in EPLp adds to the negative relation between autonomy and the risk of temporary employment. However, increasing EPLt increases the strength of the autonomy mechanism (Model 1c), and the strength of the effect of EPLt on the autonomy mechanism does not vary across the distribution of EPLp. Since following hypothesis 2a, increasing EPLt was expected to be related to a decreasing strength of the autonomy mechanism, and this effect was expected to be stronger in higher EPLp environments, these results do not provide support for hypothesis 2a.

To facilitate interpretation, predicted probabilities of temporary employment have been calculated for increasing skill specificity in varying EPL environments (since Table 4.2 does not support an autonomy/EPL interaction, predicted probabilities for autonomy are not calculated). These probabilities have been calculated for the full range of skill specificity in the data (1-8). Since EPLp ranges from 1.20 - 4.42 in the data, predicted probabilities have been calculated at EPLp = 1, EPLp = 2, EPLp = 3 and EPLp = 4 and, since EPLt ranges from 0.38 - 3.63 at EPLt = 1 and EPLt = 3. This results in 4 plots containing 2 linear fits each, as shown in Figure 4.1. Figure 4.1 shows that the probability of temporary employment increase for increasing EPLp, as indicated by the moving up of the lines for increasing EPLp, i.e. across the panes. Moreover, low EPLt in high EPLp environments is generally associated with a strong negative relation between skill specificity and the probability of temporary employment, as compared to 1) high EPLt in high EPLp environments and 2) low EPLp environments in general (pane 1 and 2). This is indicated by the stronger negative slope of the EPLt = 1 line in high EPLp environments 1) as compared to the slope of the EPLt = 3 line (fourth pane), and 2) as compared to the slopes of both EPLt lines in low EPLp environments (pane 1 and 2). Moreover, Figure 4.1 shows that these effects are not trivial: in EPLp = 3 and EPLt = 1 environments for instance (approximately the values for Germany), high skill specificity employees have a predicted probability of temporary employment of about 0.18, compared to 0.33 for low skill specificity employees.

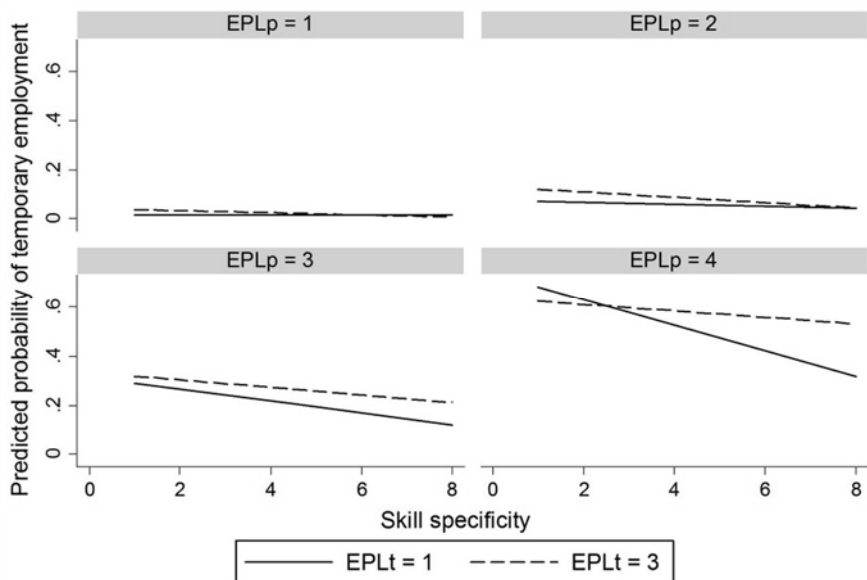


Figure 4.1: Predicted probabilities of temporary employment for increasing specificity, in different EPLp-EPLt environments. Probabilities are based on Model 1g and calculated for a hypothetical respondent with mean values of the remaining covariates from Model 1g (source: ESS, wave 2 and 5).

It should be noted however, that higher EPLt is generally associated with higher probabilities of temporary employment, as indicated by the higher y-values of the dashed line. This is not well explained by the proposed mechanism. Since results from analysis on a small samples of countries may be driven by outliers, in Appendix E a number of robustness checks is performed. In general, the strong robustness of the coefficients and the relatively strong robustness of the p-values against changes in the sample indicate that the influence of EPL characteristics is not driven solely by the presence of outliers.

It is assessed whether larger differences between the protection of temporary and permanent employment strengthen the negative relation between education and the risk of temporary employment (hypothesis 3b), and whether this mechanism partly or completely explains away the skill specificity effect found above (hypothesis 3c). Since the autonomy mechanism was not supported by the results in Table 4.2, the remainder of this discussion focusses on the proposed independence of the skill specificity mechanism. Table 4.3 shows the results for Models 2a-2e.

Table 4.3: Results from Models 2a-2e: estimating the effect of EPLp and EPLt on the autonomy and specificity mechanism and their relation to the education mechanisms found by Gebel & Giesecke (2011) (source: ESS, round 2 and 5).

	(2a) Temporary contract	(2b) Temporary contract	(2c) Temporary contract	(2d) Temporary contract	(2e) Temporary contract
Autonomy	0.0534 (1.68)	-0.0385*** (-5.84)	-0.0387*** (-5.83)	0.00454 (0.20)	-0.0385*** (-5.77)
Skill specificity	-0.169*** (-8.65)	0.278 (1.96)	-0.169*** (-8.61)	-0.169*** (-8.67)	0.192 (1.23)
Education	-0.0918* (-2.37)	-0.0944* (-2.48)	0.408*** (3.85)	0.384*** (3.94)	0.277* (2.08)
EPLp	1.712** (2.79)	2.187** (2.95)	2.173*** (3.45)	2.239*** (3.60)	2.524*** (3.54)
EPLt	0.540 (1.07)	0.972 (1.52)	0.926 (1.78)	0.992 (1.91)	1.248* (2.05)
EPLp * EPLt	-0.127 (-0.93)	-0.292 (-1.50)	-0.314* (-2.09)	-0.324* (-2.15)	-0.414* (-2.21)
Autonomy * EPLp	-0.0304* (-2.01)			-0.00995 (-0.94)	
Autonomy * EPLt	-0.0293 (-1.75)			-0.00758 (-0.55)	
Autonomy * EPLp * EPLt	0.00730 (1.03)			-0.00156 (-0.26)	
Skill specificity * EPLp		-0.170** (-2.86)			-0.135* (-2.16)
Skill specificity * EPLt		-0.166** (-2.64)			-0.126 (-1.82)
Skill specificity * EPLp * EPLt		0.0578* (2.15)			0.0421 (1.48)
Education * EPLp			-0.212*** (-4.08)	-0.208*** (-4.41)	-0.161** (-2.77)
Education * EPLt			-0.218** (-3.24)	-0.218** (-3.29)	-0.166* (-2.15)
Education * EPLp * EPLt			0.0873*** (3.50)	0.0898*** (3.74)	0.0681* (2.47)
N	22148	22148	22148	22148	22148

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

The results from model 2a and 2c mirror the findings by Gebel & Giesecke (2011) and support hypothesis 3a and hypothesis 3b: education is negatively related to the risk of a temporary contract, and more so as EPLp and the relative deregulation of temporary employment increase. In Appendix E, these results are shown to be robust against changes in the country-sample, although some concerns are warranted with regard to the disproportionate influence of Portugal.

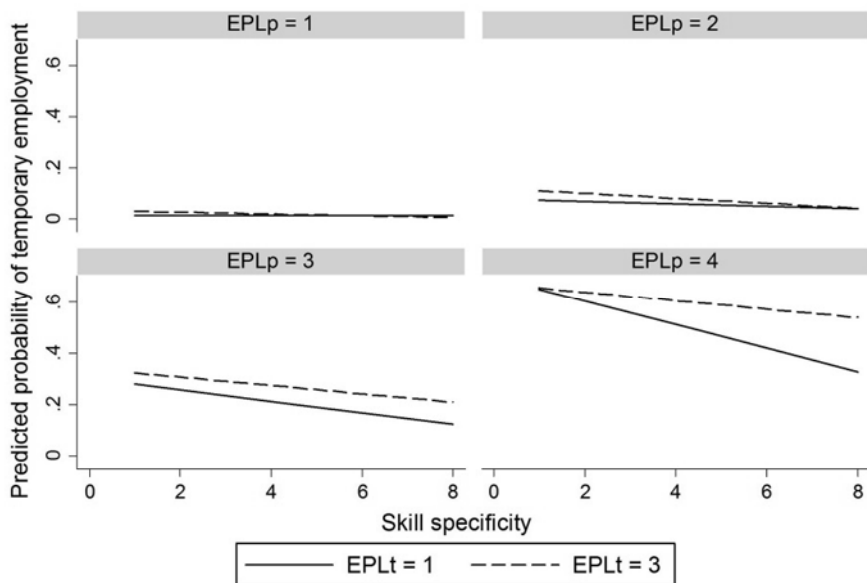


Figure 4.2: Predicted probabilities of temporary employment for increasing specificity, in different EPLp-EPLt environments. Probabilities are based on Model 2e and calculated for a hypothetical respondent with mean values of the remaining covariates from Model 2e (source: ESS, wave 2 and 5).

The results for the EPLt indicator are again somewhat puzzling: increasing EPLt strengthens the education mechanisms where a weakening effect would be expected. Moreover, the education mechanism absorbs much of the relation between skill specificity and the relative deregulation of temporary employment: the three-way interaction is non-significant in Model 2e and the coefficient shows a moderate decrease. The relation between EPLp and the effect of skill specificity on the risk of a temporary contract remains significant and quite strong however. These results provide some support for hypothesis 3c. Figure 4.2 (based on Model 2c) shows that the skill specificity mechanism holds at the extremes of EPLp and EPLt even when controlling for the education mechanism, but at EPLp = 3 the relation is less profound than in Figure 4.1.

4.4.2. EPL and the trapping effect of temporary employment

The relation between temporary employment in wave x-1 and temporary employment in wave x is shown per country (Figure 4.3).

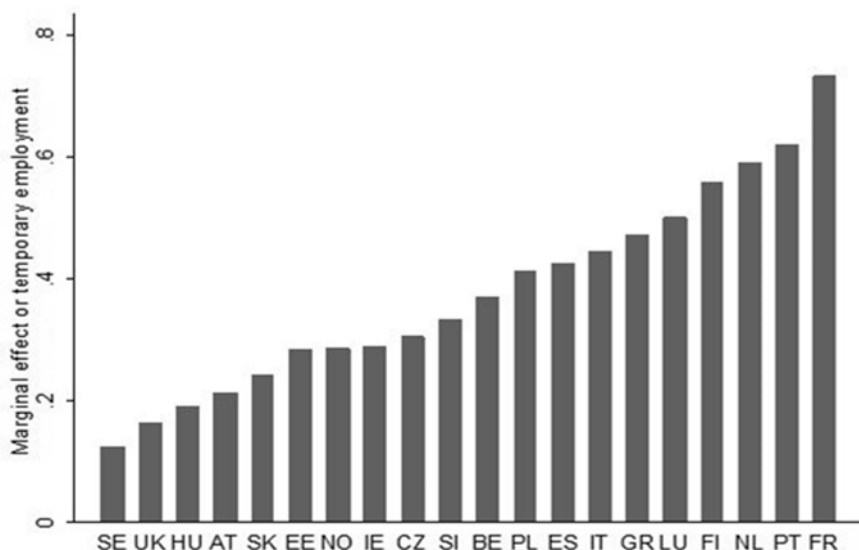


Figure 4.3: The marginal effect of the first lag of temporary employment on the risk of temporary employment in wave x, per country in the sample. Estimated by adapting Model 2a in order to estimate the cross level interaction between country-dummies and the lag of temporary employment, with controls.

These are the results of model 2a with cross-level interactions between country-dummies and the lag of temporary employment. As shown in Figure 4.3, the trapping effect of temporary employment is positive (and significantly so) in all countries. This strongly confirms hypothesis 4a.

The strong trapping tendency of temporary employment is shown by the significant positive coefficient in Models 3a and 3c in Table 4.4. this confirms both hypotheses 4a and 4b. However, Models 3b and 3d show that the trapping effect of temporary employment is unrelated to EPLp and EPLt, providing no support for hypotheses 4c and 4d.

Table 4.4: Results from multilevel logit regression of the cross-level interaction between the lag of temporary employment and the relative protection of temporary employment.

	(3a)	(3b)	(3c)	(3d)
	Temporary contract	Temporary contract	Unemployment	Unemployment
Lag temporary contract (ref: permanent contract)	1.785*** (14.17)	1.614*** (18.03)	0.496 *** (11.85)	0.783** (2.23)
EPLt	0.0501 (0.43)	-0.404 (-1.06)	-0.0408 (-0.21)	-0.583 (-1.68)
EPLp	0.313* (2.49)	0.110 (0.49)	0.0866 (0.14)	-0.0639 (-0.10)
EPLp * EPLt		0.141 (1.17)		0.192 (1.92)
Lag temporary contract * EPLt		-0.0958 (-0.21)		-0.0520 (-0.29)
Lag temporary contract * EPLp		0.0495 (0.13)		-0.177 (-1.16)
Lag temporary contract * EPLp * EPLt		0.132 (0.74)		-0.0465 (0.62)
Temporary contract at t0 (ref: permanent contract)	0.512*** (14.18)	0.497*** (12.56)	0.192*** (5.08)	0.194*** (5.14)
Individual-level covariates	yes	yes	yes	yes
Country & wave dummies	yes	yes	yes	yes
N	129559	129559	136327	136327

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<.001

4.5. Discussion

The first aim of this chapter was to shed light on whether and how institutional characteristics influence inequalities in the risk of temporary employment and whether these inequalities are skill or job-based. First, in line with Chapter 3, it was proposed that an employees' risk of temporary employment decreases with an increasing level of autonomy and skill specificity associated with the job, and an increasing level educational attainment of the employee. Second, it was proposed that the relative deregulation of temporary employment interacts with the autonomy and specificity mechanisms to increase the risk of temporary employment for employees in jobs with low skill specificity and low autonomy,

and to decrease it for high specificity and high autonomy jobs. It was shown that the risk of temporary employment is negatively related to an employee's autonomy in their job, to their degree of firm-specific skills (confirming hypothesis 2a), and to their level of educational attainment. The strength of the skill specificity and educational mechanisms was shown to increase with the relative deregulation of temporary employment, whereas the autonomy mechanism was not influenced. The latter result remains unexplained, but the results from Models 1b and 1d do indicate that the autonomy mechanism increases in strength when EPLp increases relative to EPLt. This implies that the autonomy mechanism is sensitive to variation in EPL, but more so to the absolute than the relative protection of permanent employment. The absence of the expected relation with autonomy may be a result of the fact that employers may hesitate to offer high autonomy employees permanent contracts for fear that these may drive them to shirk (Lazear, 1995). This would have the opposite effect of the autonomy mechanism as formulated in this chapter. Additionally, it may indicate that temporary and permanent employment are not competing choices when employers consider levels of autonomy: based on the costs/benefits associated with a permanent contract they decide whether or not to hire an employee on a permanent contract, with temporary employment the alternative regardless of its implications for costs and benefits. This deserves further examination.

The skill specificity mechanism partly disappeared when the interaction between educational attainment and the relative deregulation of temporary employment was controlled for, but not altogether. These results add detail to Gebel & Giesecke's (2011) findings. While they propose mechanisms rooted in transaction cost theory and measure their outcomes using educational attainment, the results from this chapter show that both transaction costs and education independently interact with the relative deregulation of temporary employment to distribute the risk of temporary employment. Additionally, the results show that part of the skill specificity mechanism is explained by employees' difference in educational attainment. Disentangling cause and effect here is notoriously difficult, since it could be argued that when skills are matched to a job these two partly cease to exist as independent entities. It becomes indiscernible whether a highly educated, i.e. trainable, employee was hired because the job requires the acquisition of high degrees of firm specific skills, or whether a highly educated employee has shaped their job to match their level of skill, all the while increasing the time it would take to train their replacement. The results from Chapter 3 support the idea that transaction costs associated with the job matter independently of the level of education of the employee, although the extrapolation of the results of Chapter 3 to different EPL regimes should be done with caution. Finally, here as in Chapter 3, the ability issue should be assessed in future research: not only may high ability individuals select into high specificity and high autonomy jobs, but they expectedly also select into high education. Future research using longitudinal data should analyse the extent to which the relations proposed in this chapter exist independent of the individual's ability.

Additionally, it was proposed that temporary employment can constitute a trap, which keeps temporary employees from transiting into permanent employment across institutional settings (hypothesis 4a). This hypothesis found broad support, as past temporary employment was found to increase the risk of future temporary employment in all countries separately and consequently on average in a pooled sample of all these countries. These results held when the risks past temporary employment poses for future unemployment were assessed (hypothesis 4b). Finally, it was proposed that the trapping effect of temporary employment would be stronger in countries with a high relative deregulation of temporary employment (hypothesis 4c), which was also proposed to hold for the risk of unemployment posed by temporary employment (hypothesis 4d). These hypotheses did not find support in the data. The results in this chapter indicate that the specifics of the EPL regime have implications for the incidence of temporary employment (as shown by the consistently positive effect of EPLp), and for the allocation of temporary employment along the lines of job characteristics and educational attainment. Through these channels and through the trapping effect of temporary employment, the EPL regime influences the tendency of individuals' risk of future temporary employment and unemployment. The EPL regime does not reinforce the trapping mechanism itself however.

This chapter shows that employment protection legislation has profound implications for inequality in society. Through employers' decision making, employees in low specificity jobs may find themselves increasingly in temporary employment as the protection of permanent employment increases. Moreover, these inequalities are likely persistent over time on the individual level, as temporary employment has a tendency to trap individuals and increase the risk of future unemployment. This points to a strong tendency of numerical flexibility and unemployment risks to go hand in hand, with the size and vulnerability (in terms of job and skill level) of the numerically flexible segment of the labour force increasing with the protection of permanent contracts and the deregulation of temporary employment. Through its implications for the size and structure of the numerically flexible segment of the labour force and the risk of unemployment, EPL affects individuals' risk of precarious employment.

Since they were shown to often be lower skilled or occupying lower level job, it is expected that the wages of temporary employees are lower than those of permanent employees and likely their unemployment benefits are lower as well, as the latter are often related to past wages. These propositions are evaluated in Chapter 6. If true, temporary employees not only suffer an increased risk of losing their income, but have fewer means to prepare themselves for the situation by saving parts of their wage and a lower replacement income when the risk of a loss of income materializes. If so, these temporary employees would be truly precarious

Given the large variation in numerical flexibility between employers, it seems likely that job-level explanations are not solely responsible for employers' use of numerical flexibility. Chapter 5 explores the extent to which employers' HRM attitudes affect employees' risk of numerical flexibility.

Chapter 5

Employers' HRM attitudes and numerical flexibility

5.1. Introduction

This chapter is the third in a series of three chapters that specifically address the dimension of numerical flexibility that underlies the conceptualisation of precarious employment proposed in Chapter 2. In contrast to Chapters 3 and 4, this chapter addresses this issue through the prism of employers' Human Resource Management HRM attitudes rather than the characteristics of the jobs in their company. Chapters 3 and 4 have shown factors related to the environment, such as employment protection legislation and demand volatility, and factors related to personnel requirements, such as the educational makeup of the payroll and the characteristics of the jobs in the company, to be of particular influence in employers' use of numerical flexibility (see also: Abrahams, 1988; De Graaf-Zijl, 2005; Emmenegger, 2009; Gebel & Giesecke, 2011; Houseman S., 2001; Kalleberg, Reynolds, & Marsden, 2003). However, some of the strong variation in outcomes with regard to numerical flexibility (see Figure 1.2) is likely to be driven by idiosyncratic practices within the organisation. This reflects Rees and Fielder's (1992) observation that the utilisation of flexible employment is driven in an important way by factors particular to individual firms. Moreover, in line with Lepak and Snell (1999), Michie and Sheehan-Quinn (2001) define four HRM systems, with varying commitment to employment security, on which employers show considerable variation after controlling for sector and company size. However, theirs is a one-country study, and differences in the human capital of employees on the payroll are not controlled for. Specifically with regard to management, Geare, Edgar, and McAndrew (2009) show that management's choices concerning HRM strategies are likely influenced by management's evaluation of the degree to which employers' and employees' interests are aligned or collide.

This chapter thus addresses the relation between numerical flexibility and employers' attitudes with regard to HRM. Are employers who consider their employees stakeholders and consequently emphasise consultation, communication, and employee commitment less likely to adopt numerical flexibility? If employers' HRM attitudes are related to their use of numerical flexibility, the degree of variance they explain remains to be assessed. Are explanations rooted in HRM theories useful additions to the often-used explanations with regard to environmental characteristics, job characteristics, and personnel requirements? In other words, do HRM-based explanations add something to the variance explained by models already containing variables describing the company's environment and personnel requirements? Because employers ultimately decide whom to hire on numerically flexible contracts, their attitudes with regard to these decisions are relevant to investigating precarious employment. Employers who have a strong tendency to hire employees on numerically flexible contracts may condemn their employees to cycles of numerical flexibility and precarious employment (in line with the findings from

Chapter 4), whereas employers who disfavour numerical flexibility may prevent their employee from precariousness.

Because this chapter addresses an issue on which research is scarce, the analysis builds on a narrow theoretical basis and inherently has a strong exploratory character. The theoretical and empirical relevance of HRM attitudes in understanding outcomes related to numerical flexibility are supported by a number of exploratory interviews with HR managers in four Dutch organisations. The main body of scientific evidence, however, is provided by a large international dataset, i.e., the European Company Survey. By using a large international dataset to address the issue of employers' HRM attitudes, this chapter attempts to obtain quantitative leverage over a hitherto understudied issue and to offer suggestions for further research in this field. This chapter shows that some indicators for employers' use of consultation and their tendency to communicate with their employees are related to employers' use of numerical flexibility. However, these effects are sufficiently few and ambiguous to call for a significant improvement of the underlying theoretical framework based on management ideology and psychological contract theory. This is reinforced by a second analysis, which shows that more traditional explanations, such as variations in workload and the skill level of the workforce, contribute much more to explaining variation in numerical flexibility.

5.2. Theoretical framework

5.2.1. Employer-level variation in numerical flexibility

As shown in Figure 1.2 in Chapter 1, the incidence of numerical flexibility in the Netherlands varies greatly between sectors and between employers. In most sectors of economic activity there exist employers who have made their entire payroll numerically flexible. At the same time, however, there exist employers within these same sectors who have refrained from making any personnel numerically flexible. Indeed, as early as 1988, Abrahams showed that significant employer-level variation exists in the use of flexible staffing, specifically in the use of temporary employment and on-call workers. These results were more recently confirmed by Houseman (2001), and they are reflected in Figure 1.2.

In part, differences between employers can be explained by structural differences between companies. The optimal staffing policy is likely dependent on the organisations' environment. High dismissal protection for permanent contracts drives employers to increase their use of temporary contracts, whereas a strong difference between the protection of permanent and temporary contracts drives employers to increasingly distribute temporary contracts to the low-educated (see Chapter 4 and Gebel & Giesecke, 2011; Polavieja, 2003). More volatile and unpredictable environments require the organisation to be able to

staff flexibly, whereas stable environments allow for more stable staffing (see Chapter 3 and Davis-Blake & Uzzi, 1993; DiMaggio & Powell, 1983). Moreover, staffing policies are influenced by the type of jobs the organisation needs performed and its personnel requirements: jobs that foster the accumulation of firm-specific human capital and that are difficult to monitor require employers to elicit commitment from the associated employees and tie them into the organisational hierarchy (see Chapters 3 and 4, and Kalleberg, Reynolds, & Marsden, 2003; Osterman, 1987; Schram, Brandts, & Gèrxhani, 2010). Similarly, as a result of high screening costs and congestion effects (Andrews, Bradley, Stott, & Upward, 2008), highly educated employees are difficult to replace and are consequently incorporated into the organisational hierarchy.

5.2.2. *Theoretical considerations from interviews with HR representatives*

The above explanations of variation exist on the level of institutions, the sector of economic activity, the organisation, the job, or the employee. As such, they do not account for agency on the side of the employer. How might employers' attitudes with regard to employment relations influence their tendency to utilise numerical flexibility? To explore this question, HR representatives from four Dutch organisations were interviewed, namely, a software company called "Software Inc.", a tire manufacturer called "Tires Inc.", a luxury hotel called "Hotel Inc.", and a large municipality called "Municipality.". These interviews were semi-structured and probed the organisations' use of numerical flexibility, their allocation of numerical flexibility, and their general view on employment relations.

A common theme in the answers of the representatives of Software Inc. and Tires Inc. was the use of (the prospect of) a permanent position in the organisation as a way to commit employees to the organisation to boost productivity or to prevent shirking. This line of reasoning resonates with psychological contract theory, which would suggest that employers who value employee commitment and organisational citizenship behaviour invest in the employment relation to trigger reciprocal responses (Coyle-Shapiro & Kessler, 2002; Guest, 2004; Guillermo & Rousseau, 2004; Rousseau, 1989). This is indicated by the quote of the HR representative of Tires Inc.:

"If you are an employee in production and you know that after 78 weeks, you will be exiting again, that negatively affects the employment relation."

-M., HR representative at Tires Manufacturing Inc.-

This is in line with the propositions put forward in Chapters 3 and 4. Although the representative indicated a preference for permanent contracts, he stressed that offering permanent contracts was not always possible or desirable. He followed

up on the first quote by explicating that their need for flexibility drove them to adopt a flexible buffer.

As proposed by psychological contract theory, investments in the employment relation can be either implicit or explicit. “Carrot-and-stick” approaches to incentivising employees fit into the category of explicit investments and explicit attempts to elicit reciprocity, whereas incorporation into the organisational hierarchy is an implicit and on-going investment meant to elicit commitment. That permanent contracts imply an on-going investment and foster a trust relation, which in turn elicits commitment, was suggested by the HR representative of Software Inc.:

“In the end, I think that generates more engagement, absolutely, because you trust someone, which is the aim of an open-ended contract. To show trust and prevent a fear of failure from manifesting and to enter a long-term relationship to become successful together. “

-R., HR manager at Software Inc.-

This suggestion finds support in the literature: A review by Guest (2004) shows that variations in explicit investments in psychological contracts by employers affect temporary employees’ commitment and effort more than they affect those of permanent employees, but the latter have higher average levels of commitment. Guest’s (2004) results reflect the idea that a permanent contract is related to implicit and on-going investments, which makes employees less sensitive to the occasional additional explicit investment, while numerical flexibility is related to more explicit and variable investments. However, the representative from Hotel Inc. inadvertently problematised the assumption that permanent contracts are related to implicit investments, whereas numerical flexibility is related to explicit investments:

“It happens that for higher positions, we promote the employee to a permanent contract sooner (before it is legally mandatory – eds). As a way of rewarding and holding on to people.”

-A., HR manager at Hotel Inc.

As she indicates, a permanent contract in itself may serve as an explicit investment or an incentive with which to elicit a reciprocal response. All representatives seemed to agree, however, that a focus on commitment, as proposed by psychological contract theory, is best served by offering permanent contracts for those employees they wished to commit to the organisation. This is in line with the propositions from Chapter 3.

Psychological contract theory thus identifies two specific methods by which employers may elicit effort: through explicit investments in an otherwise arms-

length employment relation (associated with numerical flexibility) or through implicit investments and signalling on-going commitment (associated with permanent employment). As Guest (2004) indicates, however, in many cases both approaches may be equally effective in eliciting effort. What then determines employers' choice of either approach? This is likely influenced by the considerations put forward in the previous chapters: employees in autonomous jobs that require specific skills are best committed to the organisation, whereas employees in jobs with less autonomy and skill specificity might be motivated by incentives. A complementarity between skill specificity and permanent contracts is supported by a quote by the representative of Software Inc.:

"We have a strong power to innovate here, new product releases and new market trends we have to adopt and that means you want to hold on to human capital. You just don't want them to leave. Because when that happens, you are set back in time and you have to start over again by training new people."

-R., HR manager at Software Inc.-

Another venue for explaining the choice between using a psychological contract approach to the employment relation or not is suggested by the representative of Software Inc. in response to a follow-up question:

"Partly, it is in the company's DNA, like I said, it's in its culture. Per country (Software Inc. is a multinational –eds) you can put your own mark on this, and we have specifically chosen to enter a long-term relationship with our employees"

-R., HR manager at Software Inc.-

The representative clearly identifies organisational culture as one of the reasons why Software Inc. is inclined to use permanent contracts. As Goll (1991) argues, an organisation's culture is partly defined by the ideology of its management. In the context of HRM and employment relations, ideology is defined as "values and beliefs relating to employment relations, to industrial relations and human resource management theory" (Geare, Edgar, & McAndrew, 2007, p. 1190). Ideology shapes employers' views on employment relations (Goll, 1991), which ultimately inform their decisions with regard to formalising these relations.

A specific branch of HRM theory proposes that employers' view of employment relations can be either "unitarist" or "pluralist" (Fox, 1966; Geare, Edgar, & McAndrew, 2009). A unitarist view of employment relations refers to employers' belief that the interest of employers and employees are ultimately the same, whereas a pluralist view refers to the belief that these interests are fundamentally different and often opposed (Geare, Edgar, & McAndrew, 2009; Van Buren III, Greenwood, & Sheehan, 2011). HRM theory assumes that employment relations are essentially unitarist and proposes that managers

harness this fact in order to improve organisational performance (Geare, Edgar, & McAndrew, 2007). Managers with a unitarist view of employment relations expectedly consider their employees as stakeholders and are more likely to adopt HRM strategies focused on eliciting commitment (Geare, Edgar, & McAndrew, 2009), such as consultation and communication with their employees (Moore & Gardner, 2004). These methods for eliciting commitment strongly resemble the implicit modes of reciprocation for management, as articulated in psychological contract theory (see, for instance, Coyle-Shapiro and Kessler's [2002] indicators for "perceived employer obligations"). This implies a relation between unitarism and a preference for psychological contracts and thus for permanent contracts. An assumption of pluralism is strongly present in industrial relations theory, where scholars assume an "enduring conflict of interest between workers and employers in industrial relations" (Kochan, 1998, pp. 37 - 38). Examples include high wages versus low labour costs and employment security versus flexibility (Geare, Edgar, & McAndrew, 2007). The enduring conflict of interest assumed by pluralism is reflected in a quote from the HR representative from Municipality, who recalls a remark his lecturer made during a training on how to handle absenteeism.

"There (at the training -eds.) they basically said: "If you, manager, do not ask employees why they are late or why they are absent, employee-school¹⁶ has taught them to think 'o, that's easy, I'll just stay away'".

-S., HR manager at Municipality.-

Managers with a pluralist view of employment relations have a more instrumental approach to HRM, which is exemplified by a quote by the representative of Hotel Inc.:

"It is of course related to the sector. There is a lot of dynamism in the hotel and restaurant business, so the safest option is to go for fixed-term contracts. And why would you take the risk if you have the option of hiring on a temporary contract?"

-A., HR manager at Hotel Inc.-

In the remainder of this chapter, the relation between the HRM attitudes that are associated with psychological contract theory and unitarism/pluralism and employers' use of numerical flexibility is explored.

¹⁶ Naturally, there is no such thing as "employee-school". This was a rhetorical device invented by the lecturer to refer to the fact that he/she thought employees internalise opportunistic behaviour and are prone to shirking if given the freedom to do so.

5.2.3. Hypotheses

Psychological contract theory and HRM theories on culture and ideology propose that employers inclined towards unitarism elicit commitment from employees by investing in the employment relation by consulting and communicating with employees. It seems likely that employers who value an on-going psychological contract use permanent contracts as a way of inducing on-going commitment to the organisation from their employees, which complements the focus on consultation and communication. This seems plausible in light of Guest's (2004) observation that permanent employees report higher mean levels of commitment compared to temporary employees, which Guest interprets using a psychological contract framework. Employers who tend towards pluralism, on the other hand, are more inclined towards employment relations based on arm's-length carrot-and-stick approaches (Coyle-Shapiro & Kessler, 2002; Guest & Conway, 2002; Moore & Gardner, 2004; Rousseau, 1989). This seems to fit better with the use of numerical flexibility because numerically flexible employees are less attached to the organisation, which makes them sensitive to carrots and sticks. This is reflected in Guest's (2004) finding that temporary employees respond more strongly to explicit investments in the employment relation than permanent employees do.

Because "ideology" and "psychological contracts" are difficult to measure, the hypotheses here rely on their proposed manifestations. As said, both unitarism and an adherence to psychological contracts should be reflected in practices towards consultation and communication. Consequently, a negative correlation between practices aimed at consultation and communication and the use of numerical flexibility is here proposed.

H1: Employers who are inclined to consult their employees on work-related issues are less likely to use numerical flexibility than employers who are less inclined to consult their employees.

H2: Employers who invest in the communication of issues related to work and the company with employees are less likely to use numerical flexibility than employers who invest less in communication.

Next to testing these hypotheses, in this chapter, an assessment is made of the explanatory power of the proposed variables in order to evaluate the value of investigating employers' HRM attitudes when aiming to explain numerical flexibility. This is achieved by assessing the proportion of variance in numerical flexibility explained by the indicators used to test hypothesis 1 and hypothesis 2.

5.3. Method

5.3.1. Data

The hypotheses are tested using data from the European Company Survey 2009 published by Eurofound (Eurofound, 2008). The ECS surveys senior personnel managers and employee representatives from a sample of 27160 establishments in 30 European countries¹⁷, which were sampled using a stratified random sample design with the oversampling of manufacturing industries (Petraikos, Kleideri, & Ieromnimon, 2011). Managers were interviewed via telephone and asked questions regarding the economic situation of the company as well as their policies regarding contract flexibility and attitude regarding social dialogue and consultation with employees, among others. The response rate for the ECS management interviews was 29.1%. This response rate would generally be considered low and may generate concerns with regard to the representativeness of the data. It should be noted that surveys using a multi-mode strategy for data collection, e.g., via postal questionnaires, web-based surveys and face-to-face interviews, achieve higher response rates (such as the Continuous Vocational Training Survey [CVTS] with 63.3%) (Petraikos, Kleideri, & Ieromnimon, 2011). However, the response rate of the ECS is in line with surveys using a similar mode of data collection (such as the European Survey of Enterprises on New and Emerging Risks [ESENER] with 29.5%). After the management interview, the manager was asked whether an employee representative was available for an additional interview. Of the 27160 companies, 20767 (76%) had some type of formal employee representation in the company, and of these, 6569 (36% of 20767) had an interview with an employee representative recorded (interviews were recorded only if employees were partly responsible for electing the representative instead of the representative being designated by management). Employee representatives were asked questions related to consultation practices by the company, their influence in decision making and the resources made available by the company to facilitate the function of employee representatives.

Identifying “the employer” is inherently difficult because a different individual may be responsible for decisions regarding employment relations depending on the nature of the decision, or the moment in time when it is taken (Di Stasio, 2014). In the ECS, the main respondents are “the most senior person who is in charge of personnel” in a given establishment (Eurofound, 2008). The relation between these managers and the employer is essentially a principal-agent relationship, which means that the view of these managers on employment relations and their attitudes towards participation and consultation may differ from those held by the employer in a broader sense. Though it is unknown whether these respondents make decisions regarding numerical flexibility and participation practices themselves, it seems reasonable to assume that they know

¹⁷ AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LIT, LU, LV, MK, MT, NL, PL, PT, RO, SE, SI, SK, TR, UK.

of and can influence these decisions and -- by and large -- subscribe to them. Although invaluable to this chapter, the potentially low representativeness of the data and the difficulty in identifying the employer should be borne in mind when interpreting the results.

5.3.2. Operationalisation: dependent variables

The ECS questionnaire features a number of questions on the use of a variety of numerically flexible employment arrangements. Rather than making an *a priori* choice as to which arrangement is likely to be most strongly related to HRM attitudes/practices, all flexible arrangements are combined in a scale to gauge employers' tendency to use numerical flexibility in any form. The ECS management questionnaire provides information on the use of four forms of numerical flexibility: flexitime (part-time contracts with "working hours which are fixed a few days or hours in advance according to the establishment's needs" [Eurofound, 2008]), freelance employment, agency employment and temporary contracts. The ECS questionnaire asks whether each of these four forms of flexible employment are used at all. This is essentially a yes or no question that yields a dichotomous variable. These five variables are combined in a scale (0-4) to indicate the use of numerical flexibility. The proportions of employers who use each type of employment have been plotted in Figure F.1 in Appendix F. Temporary contracts (used by 56% of employers) are the dominant form of numerically flexible employment used by companies in the ECS. Flexitime (20%), freelance (22%) and agency employment (26%) are less common, but they are still used quite frequently.

The scores on the additive scale of these variables are shown in Table 5.1.

Table 5.1: Employers' distribution on the numerical flexibility scale (source: European Company Survey, 2009).

Use of numerical flexibility	Frequency	Percentage	Cumulative percentage
No numerical flexibility	5,932	26.55	26.55
1 form of numerical flexibility	7,987	35.75	62.30
2 forms of numerical flexibility	5,722	25.61	87.91
3 forms of numerical flexibility	2,245	10.05	97.96
4 forms of numerical flexibility	455	2.04	100.00
Total	22,341	100.00	

Table 5.1 shows that 26.6% of employers do not use any of the measured types of numerical flexibility. Employers that use all four types of numerical flexibility

(2.0%) are quite rare, but most employers seem to use at least one form of numerical flexibility (73.5%).

5.3.3. *Operationalisation: independent variables with regard to consultation*

The ECS questionnaire features a number of questions that could be used to measure management's use of employee consultation and their attitudes towards doing so and thus to test hypothesis 1. First, managers are asked the degree to which they consulted employees when implementing 1) changes in the remuneration system, 2) changes in the organisation of the work process, 3) changes in working time arrangements, and 4) restructuring measures. For employers who made any of these changes, Figure F.2 in Appendix F shows the proportion of these employers who consulted and did not consult the affected employees. Consulting employees when making changes is quite commonplace, but it is more common with regard to working time arrangements than remuneration. Consultation could refer to a range of practices, from supplying information, to letting employee opinions actually influence decision making, to potentially creating the illusion of consent. To assess the quality of consultation and to assess the validity of the consultation scale, using the employee representative questionnaire of ECS, a scale can be constructed for how strong the employee representative's influence on a variety of management decisions is, such as the setting of working time arrangements, health and safety matters, HRM planning, etc. (1 = very strong, 2 = quite strong, 3 = quite weak, 4 = very weak; scale alpha = 0.80). Note that this scale is not a variable in the models estimated later, but serves solely to illuminate what "consultation" as defined by employers refers to. For companies where management consults employees on at least one issue ("consultation scale" > 0.5), mean employee influence is 2.63 (standard dev = 0.63), which lies halfway between "quite strong" and "quite weak". Though employee influence on management decisions on average does not seem overwhelming, in most companies, consultation does imply some employee influence on subsequent decision making.

In the ECS questionnaire, management is asked a number of questions about how they evaluate employee consultation and participation. Though these evaluations are naturally influenced by the attitude, effort and performance of employees with regard to consultation and participation, managers' evaluation of these practices provides insight into the extent to which they view their employees as constructive participants in the organisation. Managers were asked the extent to which they agreed with the following statements: 1) "The employee representation helps us in a constructive manner to find ways to improve workplace performance", 2) "The involvement of the employee representation often leads to considerable delays in important management decisions", 3) "We would prefer to consult directly with our employees", and 4) "Consulting the

employee representation in important changes leads to more commitment of the staff in the implementation of changes” (1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree). It should be noted that these attitude questions are prefaced by prompting the respondent to answer the questions in light of their experience with the representation in their company, so employers without representation in their companies do not provide answers. Moreover, these questions were asked only where representatives were involved in operational matters, i.e., not just in matters concerning health and safety. This issue is controlled for by adding a dummy for the operational involvement of employee representation to the estimations. Although social desirability may be an issue here. Figure F.3 in Appendix F indicates that employers tend to agree with positive statements and disagree with the negative statement on delays, i.e., they are positive overall with regard to employee consultation and participation. The statement on employers’ preference to consult directly with employees is answered quite diversely when compared to the other statements.

As a final gauge of managements’ attitudes towards consultation, the resources made available for employee representatives to carry out their duties are an indicator. The ECS asks employee representatives 1) whether management allows the employee representative to take sufficient time off work to fulfil their duty as a representative (yes/no), and 2) whether they receive training on issues specific to their role as employee representatives (yes/no). It should be noted that both questions contain subjective elements and are therefore likely contain some noise resulting from heterogeneity in employee representatives’ judgement of what is “sufficient” time and what are “issues specific to their role”. Moreover, when relations between the representative and management are strained, representatives may understate managements’ willingness to provide resources. If adversarialism between the parties were related to the use of numerical flexibility, this may cause an overestimation of the relation between numerical flexibility and the resources made available by management. It should be reiterated that not all companies had employee representatives, and not all representatives were interviewed by the ECS. When working with employee representative variables, dummies are added to the estimations to control for whether the company has formal employee representation and for whether an interview with the representative is available. Figure F.4 in Appendix F shows employers’ tendency to provide training and time off work to employee representatives as indicated by employee representatives, and it shows that employers that provide these resources are relatively rare.

5.3.3. *Operationalisation: independent variables with regard to communication*

To assess whether employers who communicate with their employees make less use of numerical flexibility (hypothesis 2), data from the employee representative questionnaire is used. Employee representatives were asked how often they received information from management regarding 1) the economic situation of the company, 2) the employment situation of the company, and 3) the number of overtime hours (1 = at least once a month, 2 = several times a year, 3 = once a year, 4 = less than once a year, 5 = never). The responses to these questions are summarised in an additive scale (alpha = 0.68). The scores on the separate variables are shown in Figure F.5 in Appendix F. In general, communication of information on the economic situation of the company, the employment situation, and the number of overtime hours is not a common phenomenon. Consequently, a 15 score is heavily overrepresented amongst the scores on the additive scale of these variables. Again, this variable leans on an employee evaluation of employers' practices, so caveats apply with regard to potentially strained relations between the two groups.

A second set of variables is used as indicators of the usefulness and quality of the provided information. Each employee representative was asked how often information from the employer was classified, i.e., they were not allowed to disseminate it to the workforce (1 = frequently, 2 = sometimes, 3 = almost never), whether they usually received the information in a timely and unrequested fashion (yes/no), and whether the disclosed business information is usually sufficiently detailed (yes/no). These variables were added separately, as they did not form a consistent scale. With regard to these variables, it should be reiterated that they were reported by the employee representatives: in companies where the relation between management and employees is less than cooperative, representatives may understate the quality and frequency of the supplied information. Figure F.6 in Appendix F shows that when employers provide information, employee representatives tend to be unsatisfied with the degree of detail and the timely and unrequested delivery of the information. The information is rarely classified, however.

5.3.4. *Estimation strategy*

To estimate the relation between HRM attitudes with regard to consultation and communication on the use of numerical flexibility, multilevel regression models are estimated with the respondent at level 1, the sector of economic activity at level 2, and the country at level 3. A first set of models is estimated without any control variables to explore the association between employers' HRM attitudes and their use of numerical flexibility. Four models are estimated to assess the

relation between employers' consultation practices and the use of the numerically flexible employment scale (Model 1a), the relation between employers' attitudes towards consultation and the use of numerical flexibility (1b), the relation between the resources made available to the employee representative and the use of numerically flexible employment (1c), and the relation between communication practices and the quality of information communicated and numerical flexibility (1d).

Model 1a

$$\text{Numflex_use}_{ijk} = \alpha + \beta_1(\text{cons_wrktime}_{ijk}) + \beta_2(\text{cons_restr}_{ijk}) + \beta_3(\text{cons_remun}_{ijk}) + \beta_4(\text{cons_proces}_{ijk}) + \varepsilon_{ijk} + u_{jk} + v_k$$

Model 1b

$$\text{Numflex_use}_{ijk} = \alpha + \beta_1(\text{ERopinvol}_{ijk}) + \beta_2(\text{attitude1}_{ijk}) + \beta_3(\text{attitude2}_{ijk}) + \beta_4(\text{attitude3}_{ijk}) + \beta_5(\text{attitude4}_{ijk}) + \varepsilon_{ijk} + u_{jk} + v_k$$

Model 1c

$$\text{Numflex_use}_{ijk} = \alpha + \beta_1(\text{ERpresent}_{ijk}) + \beta_2(\text{ERint}_{ijk}) + \beta_3(\text{ERtimeoff}_{ijk}) + \beta_4(\text{ERtraining}_{ijk}) + \varepsilon_{ijk} + u_{jk} + v_k$$

Model 1d

$$\text{Numflex_use}_{ijk} = \alpha + \beta_1(\text{ERpresent}_{ijk}) + \beta_2(\text{ERint}_{ijk}) + \beta_3(\text{communication}_{ijk}) + \beta_4(\text{info_detailed}_{ijk}) + \beta_5(\text{info_timeunreq}_{ijk}) + \beta_6(\text{info_classified}_{ijk}) + \varepsilon_{ijk} + u_{jk} + v_k$$

In these models, “numflex_use_{ijk}” indicates the use of numerical flexibility by employer i in sector j in country k, as indicated by the scale discussed earlier. In Model 1a, “cons_wrktime” refers to whether the employer consulted affected employees on changes with regard to working time arrangements, “cons_restr” on changes with regard to restructuring, “cons_remun” on changes with regard to remuneration, and “cons_proces” on changes with regard to work processes. In Model 1b, “attitudes 1-4” indicate the four questions regarding attitudes towards consultation, as discussed in the paragraph on operationalisation. In this model, “ERopinvol” is a dummy for the operational involvement of the representative. In Model 1c, “ERpresent” is the dummy for whether the company has an employee representative, and “ERint” is a dummy for whether the representative, if present, provided the ECS with an interview. “ERtimeoff” and “ERtraining” are the variables of interest in this model, and they indicate whether the representative feels they have sufficient time off work to fulfil their duty as a representative and whether they receive the appropriate training to do so. In Model 1d, “communication” refers to the frequency with which information is made available to employee representatives, whereas “info_detailed”, “info_timeunreq” and “info_classified” indicate whether this information is

detailed, delivered in a timely and unrequested fashion, and unclassified, respectively. Furthermore, u_{jk} and v_k indicate the sector and country specific unobserved heterogeneity, which is not controlled for in 1a-1d, and e_{ijk} indicates the employer specific error term.

Models 1a-1d are estimated again with the control variables to see how the relation between HRM attitudes and numerical flexibility holds up when traditional explanations are added to the models.

<u>Model 1a+</u>
$\begin{aligned} Numflex_use_{ijk} = & \alpha + \beta_1(cons_wrktime_{ijk}) + \beta_2(cons_restr_{ijk}) + \beta_3(cons_remun_{ijk}) \\ & + \beta_4(cons_proces_{ijk}) + \beta_5(D:sector_{jk}) + \beta_6(D:country_k) + \left(\sum \beta_p x_{p,ijk}\right) \\ & + \varepsilon_{ijk} \end{aligned}$
<u>Model 1b+</u>
$\begin{aligned} Numflex_use_{ijk} = & \alpha + \beta_1(ERopinvolv_{ijk}) + \beta_2(attitude1_{ijk}) + \beta_3(attitude2_{ijk}) \\ & + \beta_4(attitude3_{ijk}) + \beta_5(attitude4_{ijk}) + \beta_6(D:sector_{jk}) \\ & + \beta_7(D:country_k) + \left(\sum \beta_p x_{p,ijk}\right) + \varepsilon_{ijk} \end{aligned}$
<u>Model 1c+</u>
$\begin{aligned} Numflex_use_{ijk} = & \alpha + \beta_1(ERpresent_{ijk}) + \beta_2(ERint_{ijk}) + \beta_3(ERtimeoff_{ijk}) \\ & + \beta_4(ERtraining_{ijk}) + \beta_5(D:sector_{jk}) + \beta_6(D:country_k) + \left(\sum \beta_p x_{p,ijk}\right) \\ & + \varepsilon_{ijk} \end{aligned}$
<u>Model 1d+</u>
$\begin{aligned} Numflex_use_{ijk} = & \alpha + \beta_1(ERpresent_{ijk}) + \beta_2(ERint_{ijk}) + \beta_3(communication_{ijk}) \\ & + \beta_4(info_detailed_{ijk}) + \beta_5(info_timeunreq_{ijk}) \\ & + \beta_6(info_classified_{ijk}) + \beta_7(D:sector_{jk}) + \beta_8(D:country_k) \\ & + \left(\sum \beta_p x_{p,ijk}\right) + \varepsilon_{ijk} \end{aligned}$

These models are 1a+-1d+. Here, “D:sector” indicates a vector of dummies for the sector of economic activity, which is incorporated to control for sector-specific influences on the use of numerically flexible employment, such as the tightness of the labour market, business climate and sector-specific collective agreements. “D:country” represents a vector of country dummies to control for country-specific institutional arrangements with regard to the use of numerical flexibility. Covariates are added for workload variation, the proportion of highly skilled employees, the economic situation of the company, the size of the company, and its ability to attract high- and low-skilled employees.

Finally, linear regression models are formulated to assess the proportion of the variation in numerical flexibility explained by the indicators for HRM attitudes. Three models are estimated: Model 2a estimates the variance in the use of

numerical flexibility explained by the variables of interest in this chapter, namely, HRM attitudes, while Model 2b adds the variables that served as controls in the above analyses as well as dummies for country and sector, and Model 2c subtracts the variables for HRM attitudes from Model 2b. In Models 2b-2c the “char_var” summation refers to the vector of company characteristics, i.e., the variations-in-workload variable, company size, proportion of high-skilled employees, the economic situation of the company, and the variables that indicate whether the company had difficulties in finding staff for skilled positions, and low/unskilled positions. In Models 2a-2b the “HR_var” summation refers to the vector of indicators for HRM attitudes. This vector contains variables on consultation and communication, which were discussed earlier.

<p style="text-align: center;"><u>Model 2a</u></p> $Numflex_use_{ijk} = \alpha + \left(\sum_{l=1}^{23} \beta_l(HR_var_{l,ijk}) \right) + \varepsilon_{ijk}$
<p style="text-align: center;"><u>Model 2b</u></p> $Numflex_use_{ijk} = \alpha + \left(\sum_{l=1}^{23} \beta_l(HR_var_{l,ijk}) \right) + \left(\sum_{i=23}^{29} \beta_i(char_var_{i,ijk}) \right) + \beta_{30}(D:sector_{jk}) + \beta_{31}(D:country_k) + \varepsilon_{ijk}$
<p style="text-align: center;"><u>Model 2c</u></p> $Numflex_use_{ijk} = \alpha + \left(\sum_{l=1}^6 \beta_l(char_var_{l,ijk}) \right) + \beta_7(D:sector_{jk}) + \beta_8(D:country_k) + \varepsilon_{ijk}$

5.4. Results

The results for the relation between employers’ HRM attitudes and the use of numerical flexibility without controls for company characteristics related to the environment and its personnel (Models 1a-1d) are shown in Table 5.2. Model 1a shows that employers who tend to consult employees with regard to changes in remuneration are less inclined to use numerical flexibility. This seems to be specific to changes in remuneration and does not hold for the other issues on which employees may be consulted. Model 1b shows that attitudes towards consultation are more unambiguously related to the use of numerical flexibility: employers who prefer to consult directly with employees have a low tendency to use numerical flexibility, whereas employers who think consultation leads to delays have a stronger tendency to use numerical flexibility.

Table 5.2: HRM attitudes as related to their use of numerical flexibility without controls for company characteristics related to the environment and personnel (source: European Company Survey, 2009).

	(1a)	(1b)	(1c)	(1d)
	Use of numerical flexibility	Use of numerical flexibility	Use of numerical flexibility	Use of numerical flexibility
Consultation wrt changes in remuneration (Ref: no)	-0.143** (-3.05)			
Consultation wrt changes in processes (Ref: no)	0.0801 (1.77)			
Consultation wrt changes in working time (Ref: no)	-0.0456 (-0.75)			
Consultation wrt restructuring (Ref: no)	0.0295 (0.62)			
Attitude 1 (consultation improves performance)		0.0273 (0.94)		
Attitude 2 (Prefer to consult directly with employees)		-0.108*** (-5.67)		
Attitude 3 (Consultation leads to commitment)		-0.0194 (-0.82)		
Attitude 4 (Consultation leads to delays)		0.0749* (2.36)		
Representative receives appropriate training (Ref: no)			0.0417 (0.80)	
Representative gets time off (Ref: no)			-0.267* (-2.38)	
Freq. of communication with representative				-0.00530 (-0.29)
Info is classified (note: negative scale)				-0.154** (-3.07)
Info is timely and unrequested (Ref: no)				-0.0585 (-0.57)
Info is sufficiently detailed (Ref: no)				-0.0521 (-1.21)
N	20359	20359	20359	20359

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table 5.3: HRM attitudes as related to their use of numerical flexibility, with controls for company characteristics related to the environment and personnel (source: European Company Survey, 2009).

	(1a+)	(1b+)	(1c+)	(1d+)
	Use of numerical flexibility	Use of numerical flexibility	Use of numerical flexibility	Use of numerical flexibility
Consultation wrt changes in remuneration (Ref: no)	-0.114** (-2.96)			
Consultation wrt changes in processes (Ref: no)	0.0113 (0.26)			
Consultation wrt changes in working time (Ref: no)	-0.0214 (-0.40)			
Consultation wrt restructuring (Ref: no)	0.0210 (0.43)			
Attitude 1 (consultation improves performance)		0.0432 (1.71)		
Attitude 2 (Prefer to consult directly with employees)		-0.0369** (-2.78)		
Attitude 3 (Consultation leads to commitment)		-0.0177 (-1.11)		
Attitude 4 (Consultation leads to delays)		0.0621** (2.85)		
Representative receive appropriate training (Ref: no)			-0.0370 (-0.70)	
Representative gets time off (Ref: no)			-0.149 (-1.33)	
Freq. of communication with representative				0.00635 (0.43)
Info is classified (note: negative scale)				-0.0656** (-3.01)
Info is timely and unrequested (Ref: no)				0.0306 (0.31)
Info is sufficiently detailed (Ref: no)				-0.0377 (-0.67)
N	20359	20359	20359	20359

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Finally, Model 1c shows that in companies in which representatives tend to be given time off work to perform their duties, less numerical flexibility is used. Though many indicators for consultation are unrelated to the use of numerical flexibility, the relatively unambiguous direction of the significant effects provides some support for hypothesis 1: out of 10 variables, 4 are related as expected. With regard to employers' tendency to communicate and the quality of the information they provide, Model 1d only shows that employers who disseminate classified information tend to use more numerical flexibility. Though the direction of this effect supports hypothesis 2, the absence of effects of the other indicators makes this support weak.

Table 5.3 shows the results of Models 1a+-1d+, which add controls for the characteristics of the company's environment and personnel. Similarly to Models 1a-1d, Models 1a+-1d+ show effects of some of the indicators on HRM attitudes. What stands out, however, is that the results from Models 1a-1d are largely independent of the company's environment and personnel characteristics. This supports the general proposition of this chapter that employers' HRM attitudes are independently related to the use of numerical flexibility and may not simply be spuriously related to differences in environments and personnel requirements.

To address the explanatory power of employers' HRM attitudes *vis a vis* more traditional explanations of numerical flexibility, the results from Models 2a-2c are shown in Table 5.4. As the R² of Models 3a shows, accounting for employers' practices with regard to consultation, communication explains 7.1% of the variation in their use of numerical flexibility. Adding indicators for country, sector and company characteristics increases the proportion of explained variation in the use of numerical flexibility to 24.6% (3b). Subtracting the HRM practice variables from these models shows that HRM attitudes explain between 2.1% and 7.1% of the variation in the use of numerical flexibility (3a, 3c).

Table 5.4: Proportion of variance explained by HRM attitudes and environmental and company characteristics (source: European Company Survey, 2009).

	(2a)	(2b)	(2c)
	Use of numerical flexibility	Use of numerical flexibility	Use of numerical flexibility
HRM variables	Yes	Yes	No
Environment, job & education requirements	no	Yes	Yes
N	20359	20359	20359
R-sq	0.071	0.246	0.225

5.5. Discussion

The aim of this chapter was to assess whether employers' HRM attitudes are related to their tendency to use numerical flexibility, and whether indicators add to the theoretical and empirical toolkit for understanding employer-side drivers of numerical flexibility. Generally, employers' attitudes towards consultation were related to their tendency to use numerical flexibility and the proportion of their payroll hired on temporary contracts. However, employers' tendency to communicate with employees was largely unrelated to these outcomes. Additionally, the proportion of the variation in numerical flexibility explained by these indicators for HRM attitudes was low when compared to the proportion of the variation explained by company and environmental characteristics.

A cautionary note should be made about the way the indicators for HRM attitudes were obtained. Some variables, most notably on consultation, were obtained from the management questionnaire, which may introduce some noise due to the fact that employers may be inclined to give socially desirable answers. Additionally, some variables which were used to indicate employers' attitudes were obtained from employee representatives. This may create additional noise resulting from disagreement between employers and employees on the quality of information and the resources made available to employee representatives. In future research, all variables would ideally be obtained once from a management questionnaire and once from an employee representative questionnaire. This would allow researchers to observe employers' perceptions and attitudes directly from employers, and address the issue of social desirability by assessing differences in the answers between employers and employee representatives.

Using employers' tendency to consult with their employees seems a promising venue when addressing their inclination to use numerical flexibility. Indeed, interviews suggest that employee empowerment, engagement and a low use of numerical flexibility are related. However, the way forward with consultation as the independent variable should be considered. A preference for direct consultation with employees, the absence of a consideration that consultation leads to delays, and the tendency to consult employees on changes in remuneration were among the most consistent negative predictors of numerical flexibility. Interestingly, these were also the indicators that showed the highest amount of disagreement amongst employers in the descriptive analysis, i.e. they showed a relative high degree of variance in their scores. This may indicate that it is not necessarily all employers' HRM attitudes which relate to numerical flexibility, but specifically those on which employers do not tend to agree on a "one best way". Differently put, HRM attitudes on which employers are more likely to distinguish themselves in a positive or negative sense are more strongly related to their use of numerical flexibility or lack thereof, because they reveal more about employers' ideology and their attitudes towards psychological contracts. Based on this observation, a venue for future research might be to

address the degree to which employers' attitudes deviate from an implicitly agreed upon "one best way", and its consequences for their use of numerical flexibility. This has a theoretical basis in Dimaggio and Powell's (1983) discussion of isomorphic behaviour. The authors argue that the insecurity and unpredictability of the environment may drive employers to adopt similar approaches with regard to operations and personnel. Because the insecurity and unpredictability of the environment are inexorably linked to the use of numerical flexibility, it seems likely that the use of numerical flexibility is highest amongst employers that have adopted similar approaches in other fields as well. The high users of numerical flexibility are the more "isomorphic" employers. The low users of numerical flexibility might specifically be those employers who resist isomorphic pressures and deviate from the sector average.

Compared to their influence on the environment and their personnel requirements, employers have considerable leeway in choosing and designing the HRM attitudes they consider preferable. Although based on the analysis and theory in this chapter, no claims can be made with regard to the direction of this relation, the results indicate that there exist unitarist employers, who consult their employees and are prepared to offer them secure jobs even when the job characteristics may make numerical flexibility the "efficient" choice. On the other hand, there appear to exist pluralist employers who have an instrumental view of their employees, which implies disfavoured consultation and offering numerically flexible contracts whenever it is deemed cost-efficient. Through the implications for numerical flexibility, unitarist employers keep their employees from precariousness, whereas pluralist employers may be less inclined to do so. If unitarist employers likewise pay higher wages than pluralist employers, the effect of employers' HRM attitudes on precarious employment may increase. It is beyond this dissertation to investigate the latter suggestion, however.

Chapters 3, 4, and 5 showed numerical flexibility to be related to job characteristics, employers' attitudes, and the institutional environment. Additionally, Chapter 4 showed that numerical flexibility is strongly linked to employees' risk of future unemployment, linking the first two dimensions of precarious employment, as conceptualised in Chapter 2. It remains to be assessed to what extent these numerically flexible employees are at risk of precariousness. In Chapter 6, this issue is addressed, by assessing whether and how the remaining two dimensions of precarious employment, low earnings and low unemployment benefit entitlements, are related to numerical flexibility and the risk of unemployment.

Chapter 6

Precarious employment: numerical flexibility and financial insecurity

6.1. Introduction

Next to being employed on a numerically flexible contract (Chapters 3, 4 and 5) and being at risk of unemployment (Chapter 4), precarious employees are financially vulnerable (Chapter 2). As shown by Figure 1.1 in Chapter 1, financial risks for temporary employees differ considerably between countries, resulting in differences in the risk of precarious employment. In the Netherlands, for instance, temporary employees earn less per hour than their permanently employed peers (De Graaf-Zijl, 2012), which holds for Spain as well (Mertens, Gash, & McGinnity, 2007). In France, however, differences in wages between temporary and permanent employees are virtually non-existent (Gash & McGinnity, 2007). As with earnings inequalities, between-country differences seem to exist with regard to inequalities between temporary and permanent employees' entitlement to unemployment benefits. Leschke (2006), for instance, finds that coverage rates among temporary employees are lower compared to permanent employees in Spain, Denmark and Germany, but not in the United Kingdom.

This chapter essentially consists of two parts, which together aim to answer the question: are there inequalities in the financial security of temporary and permanent employees throughout their employment trajectories? By answering this question, this chapter aims to explore potential precariousness and the degree to which numerically flexible employees may be at risk financially. As a general argument, this chapter proposes that temporary employees are financially more vulnerable than permanent employees as a result of 1) selection in temporary employment along the lines of the characteristics associated with low earnings, such as the transaction costs associated with their jobs and their education level (see Chapters 3 and 4), 2) low working hours and fragmented employment, and 3) reduced rewarding of their work by employers. Moreover, institutions whose effects are based on labour market attachment reinforce these inequalities. If these propositions indeed hold, they add to the findings that numerically flexible employees are at a higher risk of unemployment than permanent employees. This would indicate a tendency of temporary employment, and by extrapolation, numerical flexibility, to lead to precarious employment.

In the first part of this chapter, it is assessed to what extent temporary employees earn less than permanent employees as a result of working hours and months worked per year as well as compositional differences between these two groups, e.g., in terms of educational attainment, occupation and gender. These raw differentials are relevant, as they feed into a lower disposable income and a higher risk of precarious employment as defined in Chapter 2. Moreover, it is assessed to what extent this raw differential in the earnings of temporary and permanent employees results from employers rewarding temporary employees differently in terms of wages, than permanent employees, *ceteris paribus*. Differently put, it is assessed to what extent these raw differentials may result

from true earnings differentials. Additionally, institutional influences on earnings differentials are assessed. Minimum wage legislation is expected to decrease the hourly earnings differential between temporary and permanent employees at the cost of increasing the yearly earnings differential. The level of coordination in collective bargaining and the degree to which collective wage agreements are extended over the labour market are expected to decrease the earnings differential of temporary employees.

In the second part of this chapter, the dependent variable changes and the relation between institutions and inequalities in unemployment benefit entitlements between temporary and permanent employees is assessed. Because the level of unemployment benefits is generally conditional on the wage earned before unemployment, it is proposed that the low earnings of temporary employees feed into low unemployment benefit entitlements, exacerbating their risk of precarious employment. Additionally, it is proposed that institutional arrangements that make the duration of entitlements conditional on the contribution period put temporary employees at a disadvantage compared to permanent employees. This results from temporary employees' often-fragmented employment history, as shown in Chapter 4.

Overall, the results from this chapter indicate that temporary employment is related to low earnings as a result of compositional factors such as education and occupation. Additionally, the results show that some of this differential remains even after controlling for compositional differences. Combining results from different analyses suggests that part of this remaining earnings differential is explained by shorter employment tenure for temporary employees compared to permanent employees and by employers rewarding temporary employees less than comparable permanent employees for the same work. The limitations of the analyses and the data do not allow for a strict separation of these two effects, however. Institutional effects on earnings appear through effects on earnings differentials in the bottom of the raw earnings distribution as a result of the extension of collective agreements and minimum wages. Moreover, temporary employees are shown to have lower unemployment benefits as a result of compositional factors with systems that make entitlement duration conditional on the contribution, introducing an independent negative effect of temporary employment.

6.2. Theoretical framework

6.2.1. Raw and true earnings differentials of temporary employees

For an account of precarious employment, it is relevant to assess the extent to which temporary employees are likely to have low earnings. Therefore, the *raw*

earnings distribution should be assessed, i.e., the distribution of actual yearly earnings without accounting for any covariate. This is the case because raw earnings feed directly into disposable income and the ability to obtain a minimum standard of decent living, which is central to precarious employment (see Chapter 2 and Rodgers & Rodgers, 1989). Because they are probably employed for fewer hours per month and fewer months per year, temporary employees expectedly have a negative raw *yearly* earnings differential. The raw hourly earnings of temporary employees are likely lower than those of permanent employees as well because they are negatively influenced by the former being lower educated than the latter, having a lower occupational status, being younger, or being predominantly female (Barbieri, 2009; Gebel & Giesecke, 2011; Vosko, 2002). Note that the last consideration feeds into negative yearly differentials as well. This yields two hypotheses:

H1a: There exists a negative raw yearly earnings differential for temporary employees compared to permanent employees.

H1b: There exists a negative raw hourly earnings differential for temporary employees compared to permanent employees.

Next to differences in earnings between temporary and permanent employees resulting from differences in the composition of these two groups, differences might arise from employers treating similar employees from these two groups differently in terms of wages. Economic theories on compensating differentials, which find their origin in Rosen's (1974) work on hedonic prices, suggest that temporary employees are rewarded with higher earnings to compensate for the increased risk their contracts carry compared to permanent employees (De Graaf-Zijl, 2012; Moretti, 2000; Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve, 2011). On the other hand, theories on power in the workplace, such as insider/outsider theory, suggest negative earnings differentials for temporary employees resulting from the rents permanent employees can accrue as a result of their relatively high replacement costs (Bentolila & Dolado, 1994; Lindbeck & Snower, 1988). Moreover, employees on temporary contracts are dependent on their employers for continued employment, which may make them more vulnerable to exploitation than their permanently employed peers, who are more secure (Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve, 2011).

As earnings differentials that arise from these proposed mechanisms do not result from differences in personal and job attributes between temporary and permanent employees, they result from employers rewarding these attributes differently for temporary and permanent workers (Davia & Hernanz, 2004). These earnings differences are here referred to as *true* earnings differentials. Though from theory, both positive and negative true differentials could be expected, evidence seems to typically suggest negative true earnings differentials for

temporary employees (Booth, Francesconi, & Frank, 2002; Elia, 2010; De Graaf-Zijl, 2012; Hagen, 2002; Picchio, 2006). Indeed, this abundance of evidence of negative differentials prompted Picchio (2006) to claim “the theory of compensating differentials is not of great value when explaining differentials (Picchio, 2006, p. 8)”. Because evidence is in line with predictions made by insider/outsider theory and theories of exploitation rather than the theory of compensating differentials, the former theories seem to give a more accurate account, at least in Europe. Consequently, they inform hypothesis 1b:

H1c: There exists a negative true earnings differential for temporary employees compared to permanent employees.

6.2.2. Institutions and temporary employees’ financial vulnerability across countries

Research indicates the existence of between-country differences in temporary employees’ earnings differentials. In the Netherlands, after controlling for job-, employee- and employer characteristics, wages for temporary employees tend to be lower than wages for permanent employees (De Graaf-Zijl, 2012), which resembles evidence from the United Kingdom (Booth, Francesconi, & Frank, 2002). In Spain, the negative differential is present throughout the wage and occupational distribution, but differences in its size exist between occupations (Mertens, Gash, & McGinnity, 2007). However, using a model specification to control for time-invariant unobserved heterogeneity, which is a stronger test of a true effect of temporary employment on differentials, Davia and Hernanz (2004) do not find true earnings differentials between temporary and permanent employees in Spain. In France, earnings differentials hardly seem to exist (Gash & McGinnity, 2007), while in Germany, wage penalties seem to exist for men and low-educated employees but not for women and high-educated employees (Gash & McGinnity, 2007; Mertens, Gash, & McGinnity, 2007). Conversely, negative earnings differentials of temporary employees exist in Italy and are especially large for highly skilled employees compared to low-skilled employees (Elia, 2010).

These between-country differences suggest that the relation between temporary employment and earnings is mediated by the institutional environment. Institutions that compress the earnings distribution are here proposed to decrease earnings differentials between the temporarily employed and the permanently employed. In line with the framework proposed in Chapter 1, two of these institutions are identified: minimum wage legislation and the structure of collective bargaining. It is beyond the scope of this chapter to formulate propositions on the effect of these institutions on true earnings differentials because it would require an encompassing theory of how these institutions shape employers’ decisions in setting wages for temporary and

permanent employees. Consequently, the focus is on the effect of minimum wages and the structure of collective bargaining institutions on raw earnings differentials.

Because the minimum wage effectively puts a floor in the wage distribution, it tends to compress the wage distribution and limit earnings inequality (Freeman, 1996). Because minimum wages compress the wage distribution, their effect on raw earnings differentials for temporary employees is expectedly positive, as temporary employees tend to be located lower down the raw earnings distribution as a result of compositional factors (Barbieri, 2009; Gebel & Giesecke, 2011; Vosko, 2002). Although minimum wages compress the hourly earnings distribution, yearly earnings may be differently affected. Neumark, Schweitzer and Wascher (2004), for instance, show that increasing minimum wages have a positive effect on the hourly earnings of employees in the bottom of the earnings distribution, which is a result of employers being obliged to pay employees higher wages. However, increasing minimum wages are shown to have a negative effect on employees' total employment in the bottom of the earnings distribution, as a result of a reduced demand for labour following from an increase in its price, leading to an overall negative effect on disposable income (Neumark, Schweitzer, & Wascher, 2004). Because temporary employees are more easily dismissed than permanent employees, it seems likely that they suffer more from a decreasing demand for labour following an increasing level of minimum wages and thus have lower raw yearly earnings than permanent employees.

H2a: The raw yearly earnings differential between temporary and permanent employees is larger in countries with a higher minimum wage compared to countries with a lower minimum wage.

H2b: The raw hourly earnings differential between temporary and permanent employees is smaller in countries with a higher minimum wage compared to countries with a lower minimum wage.

The effect of collective bargaining on the earnings distribution likely depends on the level of coordination in wage bargaining and the degree to which the labour market is covered by collective agreements (Kahn, 2000; Pontusson, 2005). It is expected that an increasing level of coordination in wage settings increasingly standardises wages throughout the labour market, which should lead to a compression of the raw earnings distribution and results in the relative absence of extremely high and extremely low earners (Kahn, 2000). This contrasts to a situation of no coverage, which, by letting wages be determined by the supply of and demand for labour, widens the wage distribution (Kahn, 2000). Consequently, increasing coordination expectedly results in decreasing raw earnings differentials between permanent and temporary employees.

H3: The raw hourly earnings differential between temporary and permanent employees is smaller in countries with a higher level of coordination in wage setting compared to countries with a lower level of coordination in wage setting.

However, temporary employees are overrepresented in the proportion of the labour market not covered by collective agreements (Goslinga & Sverke, 2003). Consequently, it is proposed here that the degree to which coverage is indiscriminate of the type of contract influences the earnings differential between temporary and permanent employees as well. A measure of this is the degree to which collective agreements are automatically extended to cover the entire labour market or its segments, which is also defined as “a legal act in which (clauses in) a collective agreements negotiated between one or more unions and one or more employers’ associations is (are) declared binding on firms that are not member of the contracting parties” (Visser, 2013, pp. 12 - 13). Here, “increasing extension” refers to a more complete and more automatic extension. With respect to the raw earnings distribution, it is expected that increasing extension decreases the earnings differential between temporary and permanent employees. This results from the expectation that the increasingly indiscriminate coverage that follows from increasing levels of extension compresses the earnings distribution regardless of the type of contracts, and consequently lessens raw differentials. This yields hypothesis 4.

H4: The raw hourly earnings differential between temporary and permanent employees is smaller in countries with a higher level of extension of collective wage agreements than in countries with a lower level of extension of collective wage agreements.

6.2.3. Institutions and inequalities in unemployment benefit entitlements

Unemployment increases the financial risks of former employees by depriving them of wages. Unemployment benefits serve to provide a replacement income and, in the context of this dissertation, to keep former employees from precariousness. However, the monthly amount the unemployed are entitled to and the length of the period for which they are entitled to them may differ between temporary and permanent employees. In many countries, unemployment benefit entitlements are insurance-based, with the amount entitled proportional to monthly contributions, which are calculated as a proportion of monthly wages (Leschke, 2006). Moreover, the period for which an individual is entitled to benefits often depends on the period for which the individual has contributed. Because temporary employees tend to have lower compositional earnings compared to permanent employees, and the employment histories of temporary employees tend to be more fragmented than those of permanent employees (as shown in Chapter 4), it is expected that temporary employees receive fewer unemployment benefits. This yields hypothesis 5a.

H5a: There exists a negative differential in the entitlement to unemployment benefits for temporary employees compared to permanent employees.

As previously mentioned, however, it is expected that part of this differential is explained by the differences in earnings in the job before unemployment. Consequently, hypothesis 5b is proposed.

H5b: Part of the negative differential in unemployment benefits for temporary employees compared to permanent employees is explained by earnings differentials between temporary and permanent employees in the job before unemployment.

Insurance-based unemployment benefit entitlements likely discriminate against temporary employees, specifically when the entitlement duration and eligibility thresholds are linked to the contribution history (Eurofound, 2003), whereas universal entitlements are less discriminatory (Leschke, 2006). Because the employment histories of temporary employees tend to be more fragmented than those of permanent employees (Chapter 4), it is expected that temporary employees are likely to have shorter contribution periods because they are more likely to intersperse periods of contribution with periods of accessing their entitlements, i.e., during unemployment. Consequently, hypothesis 5c is proposed.

H5c: In institutional systems where the duration of unemployment benefit entitlements is conditional on the period of contribution, there exists a larger negative differential in received monthly unemployment benefits for temporary employees compared to permanent employees than in institutional systems where entitlement duration is not conditional on the period of contribution.

In practice, it would be expected that the remaining differential after controlling for earnings prior to unemployment (hypothesis 5b) would remain significant in institutional systems with some form of contribution history based period of entitlement (hypothesis 5c), whereas it would be insignificant in universal entitlement systems.

6.3. Method

6.3.1. Data

Hypotheses 1a to 5c are tested using data from the European Union Survey on Income and Living Conditions (EU-SILC). EU-SILC is a longitudinal dataset covering the 2004 – 2009 period, with coverage of the 25 EU member states plus Norway and Iceland. Due to the rotating panel design, the study tracks individuals over a maximum of four years and covers themes such as individuals' social economic

background, careers, and general health and wellbeing. Additionally, the study tracks the household in which individuals are nested by incorporating all members of the household into the study and recording variables on the household level, such as disposable income, expenses and housing conditions. The main advantages of the EU-SILC data are the encompassing nature of the income data and the longitudinal design, which allow for the fixing of individual effects and consequently the controlling for unobserved heterogeneity. However, an important drawback is the absence of information on the period an employee has been working for the same employer, i.e., their tenure. Without controlling for tenure, the results are strongly biased towards negative earnings differentials for temporary employees, which is due to incremental increases in wages with increasing tenure and the short tenure associated with temporary contracts. This issue is accounted for by comparing temporary and permanent employees in their first year of tenure after a period of unemployment, which will be further discussed in the operationalisation section.

Indicators of the country-level coverage of collective bargaining are imputed from the database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 countries between 1960 and 2007 (ICTWSS). This database was created by Visser (Visser, 2013), and is published by the Amsterdam Institute for Advanced Labour Studies (AIAS). Additionally, the indicators on the level of minimum wages are imputed from Eurostat (Eurostat, 2014). Finally, data on the characteristics of the institutional arrangements concerning unemployment benefit entitlements are obtained from the EU's Mutual Information System on Social Protection's (MISSOC) Comparative Tables on Social Protection (MISSOC, 2012). This database records, amongst others, replacement rates in unemployment benefits, qualification periods and, most relevantly here, whether the duration of benefit entitlements is conditional on the contribution history.

Hypotheses 1a to 4 are tested using a sample of 19 countries¹⁸. Though it still represents quite some variation, this sample is somewhat dominated by Eastern European countries. This is a result of the lack of data on gross income for France, Italy, Greece and Sweden (and Romania and Poland), the lack of data on temporary employment for Denmark and the lack of data on collective bargaining for Iceland. Hypothesis 5a to c are tested using a slightly different sample of 21 countries¹⁹.

¹⁸ Austria (AT), Belgium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Germany (DE), Spain (ES), Finland (FI), Hungary (HU), Ireland (IE), Lithuania (LT), Luxembourg (LU), Latvia (LV), The Netherlands (NL), Norway (NO), Portugal (PT), Slovenia (SI), Slovak Republic (SK), United Kingdom (UK).

¹⁹ Austria (AT), Belgium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Germany (DE), Spain (ES), France (FR), Finland (FI), Greece (GR), Hungary (HU), Ireland (IE), Italy (IT), Lithuania (LT),

6.3.2. Operationalisation: dependent variables

From EU-SILC, the variable on “employees’ (gross) cash or near-cash income” for the full year before the recording of the survey is used. The dependent variable in the models is the log of gross income to accommodate the empirical characteristics of earnings distributions. To account for between-country differences in absolute wage levels, models are estimated with country-fixed effects. In Figure G.1 in Appendix G, the country distributions of log earnings are shown. Generally, the distributions correspond to the expected normal distribution with the exception of Slovakia, which shows an odd deviation in the shape of a bimodal distribution. Because it is unclear whether the odd distribution for Slovakia is due to measurement error or an empirical abnormality, the country is dropped from the sample.

The earnings variable summarises total earnings in the year prior to the survey and thus sums the earnings from different jobs. This introduces measurement error when an individual switched jobs in the income reference period (i.e., the year before the survey was recorded): 10% of the sample changed jobs in the previous year, proportionally dominated by temporary employees (31% of temporary employees changed jobs compared to 7% of permanent employees). The three main reasons for temporary employees to change jobs were “to take up or seek a better job” (44% of temporary employees who changed jobs), “because the temporary contract expired” (25%), or “obliged to stop by employer (closure, dismissal, redundancy, etc.)” (13%). For permanent employees, the main reason for a change is “to take up or seek a better job” (59% of permanent employees who changed jobs), with “because the temporary contract expired” (6%) and being “obliged to stop by employer (closure, dismissal, redundancy, etc.)” (13%) being less prevalent. Specifically relevant are employees who have moved from a temporary contract into a differently rewarded permanent contract or from a permanent contract into a differently rewarded temporary contract because in these cases, the earnings of temporary and permanent employees may be confused. This concerns currently permanent employees who changed jobs in the previous year to take up a better job or because a temporary contract expired (which may imply a move from temporary employment into permanent employment) and temporary employees who were obliged to stop by the employer (which may imply a move from permanent employment into temporary employment). However, in both cases, the resulting measurement error in earnings would lead to an underestimation of earnings differentials. Consequently, job changers are left in the sample.

Naturally, the translation from yearly earnings into hourly earnings suffers from measurement error in the months worked per year and hours worked per week. The number of months worked per year may suffer from measurement

error when employees worked only a few weeks in a certain month in the previous year. Here, EU-SILC records a month spent in work when the majority of the weeks of a month were spent in work. Typically, it would be expected that the months worked per year by temporary employees contains more noise as a result of these employees being more likely to start or stop being employed in any given month of the previous year compared to permanent employees. However, the recording of the variable makes it equally likely that months worked per year are over- or underestimated, so no cumulative bias is expected. The hours worked per week are recorded as the number of hours “typically” worked in a given week. This refers to hours actually spent at work as specified in the employment contract, as overtime, and as work from home. This variable relies on the employee recalling these issues for the previous year and distilling from it a “typical” workweek, which inevitably contains some noise. However, there does not seem to be strong reason to suspect this noise to be different between temporary and permanent employees nor for it to be specifically upwardly or downwardly biased with regard to the contract variables.

To test hypothesis 5a to 5c, unemployment benefits entitlements are measured by using the log of the amount of unemployment benefits received in the relevant year of the survey. Naturally, these are not strictly entitlements, but individuals’ observed “consumption” of entitlements built up during employment. This issue obscures whether individuals were entitled to benefits but chose not to use them or whether they failed to qualify for entitlements. Because this issue cannot be addressed properly, the analysis is limited to employees who received unemployment benefits and inequalities related to received entitlements. Admittedly, this overlooks the fact that temporary employees may be at a disadvantage in qualifying for benefits, which should be kept in mind when interpreting the results. Moreover, this variable confounds the monthly amount of entitlements received and the number of months for which they were received. This issue is addressed by adding proper controls, which are discussed later. The distribution of the log of received yearly unemployment benefit entitlements is shown in Figure G.2 in Appendix G.

6.3.3. Operationalisation: individual-level independent variables

To test hypothesis 1a to 4, the main independent variable, whether an individual was employed on a temporary contract in the income reference period, is measured by asking the respondent whether they were employed on a permanent (score 0) or fixed-term contract (score 1) at the time of the interview. This variable is referred to as the “temporary contract” variable. Because temporary employees may be less likely than permanent employees to report their earnings, Figure G.3 in Appendix G shows the change in the proportion of temporary employment per country after correcting for missing earnings data. In

all countries with the exception of Hungary and Latvia, the proportion of temporary employment compared to permanent employment decreases when missing earnings are accounted for. Because this effect is expected to be skewed towards low-earning temporary employees that do not report earnings, it is expected to cause any earnings differentials detected later to be an underestimation.

To test hypothesis 1a and hypothesis 1b, the effect of temporary employment on earnings is estimated using models with random individual effects, which consequently utilise variation in temporary employment within and between individuals. Naturally, these models are sensitive to bias when unobserved individual characteristics correlate with an individual's likelihood of temporary employment and their earnings: employees with low ability or cognitive prowess may simultaneously have low earnings and be likely candidates for temporary employment. To address this issue and to test hypothesis 1c, individual-fixed effects models are estimated, which rely on variation within individuals over time. Table 6.1 shows individuals' moves between employment states (a similar table was shown in Chapter 4, but for a slightly different sample). As Table 6.1 shows, 94.9% of permanent employees stay in permanent employment, and although the 2.5% that move from permanent to temporary employment are proportionally far less common, this amount still concerns a fair number of employees. Temporary employees, on the other hand, are most likely to stay in temporary employment (51.7%), potentially with a different employer, but moving into permanent employment is not unlikely either (36.7%). The fair amount of moves from permanent into temporary employment are a useful quality of the data because they provide a counterbalance to the self-selection issue of high-ability employees that accept low-paying temporary employment because of their often-justified confidence that they will be hired on a high-paying permanent contract afterwards (Hagen, 2002). This issue is not eliminated entirely, however, and may cause a slight overestimation of true earnings differentials.

Table 6.1: Aggregate employee moves between employment states in Europe, 2004-2009 (source, EU-SILC).

	Permanent contract (t)	Temporary contract (t)	Unemployment (t)
Permanent contract (t-1)	94,859 (94.92%)	2,495 (2.50%)	2,583 (2.58%)
Temporary contract (t-1)	3,844 (36.70%)	5,419 (51.73%)	1,212 (11.57%)
Unemployment (t-1)	1,567 (17.58%)	1,262 (14.16%)	6,085 (68.26%)

There are no data available in EU-SILC on the time an employee has worked for their current employer, i.e., an employee's "tenure". Because tenure is expectedly negatively related to being employed on a temporary contract and positively related to an employee's wage, not having tenure in the data causes an overestimation of the true earnings differentials between temporary and permanent employees. To address this issue, a difference-in-difference analysis is performed, comparing individuals who moved from unemployment to temporary employment to individuals who moved from unemployment to permanent employment. Therefore, a set of models is specifically limited to employees in their first year of employment after being unemployed. This could be interpreted as a design in which one group is "treated" with temporary employment and compared to a group that is treated with permanent employment after having been unemployed, after which the difference in the difference of their earnings is observed. If the virtue of this approach is that it artificially keeps tenure constant, a drawback is that the results are essentially generalisable only to the population of employees who have just been hired. Given the specific construction of the variable, it is referred to as the "year 1 employment contract (Y1EC)" variable. It should be noted that the lack of within-individual variation on this variable disallows for a fixed-effects specification of the models (variation would exist only where a person becomes unemployed twice and is once hired into temporary employment afterwards and once into permanent employment afterwards).

With regard to the controls and their influence on the sample, it should be noted that all analyses are performed on individuals aged between 25 and 55 years to minimise the influence of students and early pensioners. Moreover, approximately 3.5% of individuals in the sample decrease their maximum educational attainment during their time in the sample. This is considered measurement error, and these observations are discarded. Naturally, this implies that there probably exists measurement error amongst the observed upward moves in educational attainment but because the unambiguous identification of these errors is not feasible, individuals with upward moves in education are left in the sample. This concerns approximately 11% of the sample, but assuming equal measurement error amongst the upwardly mobile in terms of education compared to the "downwardly mobile", only a small part of this is expected to be measurement error.

6.3.4. Operationalisation: country-level independent variables

To account for the effects of minimum wage legislation (hypothesis 2a, hypothesis 2b), Eurostat data on the monthly minimum wages per country are used (Eurostat, 2014). Because this does not account for the purchasing power associated with the minimum wage in different countries, country-fixed effects serve to account for this. Some countries in the sample have no statutory national

minimum wage, but they have an equivalent that is agreed on in negotiations between trade unions and employers (more specifically, there are no countries in the sample with no minimum wage or functional equivalent). Because for these countries, the level of the minimum wage is not provided by Eurostat, these countries have a minimum wage of €0. To account for this, a dummy is added with value 1 when minimum wages are €0 (i.e., they are non-statutory, but e.g., obtained by pattern bargaining) and 0 when they are non-zero (i.e., they are statutory). In Table G.1 in Appendix G, monthly minimum wages per country year are shown. From these values, the logarithm is calculated and used in the models. Naturally, this is not possible for the 0 values, so to keep the countries with €0 minimum wages in the sample, these values are left at €0, and the dummy again serves to absorb any distortions this might cause.

To assess the effect of the coordination of wage setting, the coordination variable from the ICTWSS dataset is used. This variable identifies five categories of coordination in wage setting, as shown in Table 6.2. A higher score is interpreted to indicate a stronger degree of coordination.

Table 6.2: Coordination in wage setting, coding (source: Visser, 2013).

0	Fragmented wage bargaining confined largely to individual firms or plants (example U.K. since 1980).
1	Mixed industry and firm-level bargaining, with no or little pattern bargaining and relatively weak elements of government coordination through the setting of basic pay rates (statutory minimum wage) or wage indexation (example France most years).
2	a) Informal (intra-associational and/or inter-associational) centralisation of industry- and firm-level bargaining by peak associations (one side, or only some unions) with or without government participation (Italy since 2000); b) Industry-level bargaining with irregular and uncertain pattern setting and only moderate union concentration (example: Denmark 1981-86); c) Government arbitration or intervention (example: U.K 1966-8, 1972-4)
3	a) Centralised bargaining by peak associations with or without government involvement, and/or the government imposition of wage schedule/freeze, without a peace obligation (example: Ireland 1987-2009); b) Informal (intra-associational and/or inter-associational) centralisation of industry- and firm-level bargaining by peak associations (both sides) (example Spain 2002-8); c) Extensive, regularised pattern setting coupled with a high degree of union concentration (example: Germany most years).
4	a) Centralised bargaining by peak association(s), with or without government involvement and/or government imposition of wage schedule/freeze with a peace obligation (example: Sweden prior to 1980); b) Informal centralisation of industry-level bargaining by a powerful and monopolistic union confederation (example Austria prior to 1983); c) Extensive, regularised pattern setting and highly synchronised bargaining coupled with the coordination of bargaining by influential large firms (Japan prior to 1998)

In Table G.2 in Appendix G, the values of the coordination variable per country year are shown. There is some within-country variation in coordination caused by changes in the structure of collective bargaining. Though within-country variation is not controlled for, the greater share of the variation is between countries, and the results from the models should be interpreted accordingly.

To account for the effect of the extension of collective wage agreements on the earnings differentials of temporary employees, the corresponding variable from the ICTWSS is used. This variable identifies four categories of the extension of wage agreements, as shown in Table 6.3. A higher score is interpreted to indicate a higher degree of extension.

Table 6.3: Extension of collective agreements, coding (source: Visser, 2013).

0	There are neither legal provisions for mandatory extension nor is there a functional equivalent
1	Extension is rather exceptional and used in some industries only because of absence of sector agreements, very high thresholds (supermajorities of 60% or more, public policy criteria, etc.), and/or the resistance of employers
2	Extension is used in many industries, but there are thresholds and Ministers can (and sometimes do) decide not to extend (clauses in) collective agreements
3	Extension is virtually automatic and more or less general (including enlargement)

To test hypothesis 5c, a final dependent variable is used that indicates whether the length of unemployment benefit entitlements is conditional on the contribution period. This variable was constructed using the MISSOC database. Although there are as many different arrangements as there are countries in the sample, this variable is here coded as a straightforward yes/no observation. Because this coding obscures much of the variation in regulations with regard to the conditionality of unemployment benefit duration, these results should be interpreted to explore whether there exists a relation between these regulations and inequalities in unemployment benefit entitlements, rather than to quantify the effects of these regulations on these inequalities. In Table G.4 in Appendix G, the countries that have systems with conditional duration are shown. Though most countries make the duration of benefits conditional on the contribution history, there is a relevant and diverse group that does not.

6.3.5. Estimation Strategy

In order to assess the raw differential in yearly earnings between temporary and permanent employees, first, a country- and time-fixed effect Model is estimated (1a) with the temporary contract variable as the independent variable and

country-level time-variant controls. In Model 1b, the log of weekly working hours and the log of months worked in the past year are added in order to estimate the raw differential in hourly earnings. In Model 1c, the true earnings differential is estimated by adding individual time-variant controls and individual-fixed effects. In Models 1d-1f, this analytical strategy is repeated with the Y1EC variable in order to tease out the effect of tenure. As previously mentioned, however, the limited within-individual variation in the Y1EC variable does not allow the individual effects to be fixed, so in Model 1f, the true differential is approximated by adding controls for observed factors alone. As such, Model 1c addresses the true differential by controlling for unobserved heterogeneity at the expense of not being able to control for tenure, whereas Models 1f accounts for tenure without being able to fully address the issue of unobserved heterogeneity. Standard errors for estimates in Models 1a-1f are adjusted for clustering by country.

Model 1a

$$\logearn_{ijk} = \alpha + \beta_1(tempjob_{ijk}) + \beta_2(D: country_k) + \beta_3(D: wave_{ijk}) + \left(\sum \beta_{nj k} x_{nj k}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 1b

$$\logearn_{ijk} = \alpha + \beta_1(tempjob_{ijk}) + \beta_2(\log_workhours_{ijk}) + \beta_3(\log_months_worked_{ijk}) + \beta_4(D: country_k) + \beta_5(D: wave_{ijk}) + \left(\sum \beta_{nj k} x_{nj k}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 1c

$$\logearn_{ijk} = \alpha + \beta_1(tempjob_{ijk}) + \beta_2(\log_workhours_{ijk}) + \beta_3(\log_months_worked_{ijk}) + \beta_4(D: country_k) + \beta_5(D: wave_{ijk}) + \left(\sum \beta_{nj k} x_{nij k}\right) + \left(\sum \beta_{nj k} x_{nj k}\right) + \varepsilon_{ijk}$$

Model 1d

$$\logearn_{ijk} = \alpha + \beta_1(Y1EC_{ijk}) + \beta_2(D: country_k) + \beta_3(D: wave_{ijk}) + \left(\sum \beta_{nj k} x_{nj k}\right) + u_{ij} + e$$

Model 1e

$$\logearn_{ijk} = \alpha + \beta_1(Y1EC_{ijk}) + \beta_2(\log_workhours_{ijk}) + \beta_3(\log_months_worked_{ijk}) + \beta_4(D: country_k) + \beta_5(D: wave_{ijk}) + \left(\sum \beta_{nj k} x_{nj k}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 1f

$$\logearn_{ijk} = \alpha + \beta_1(Y1EC_{ijk}) + \beta_2(\log_workhours_{ijk}) + \beta_3(\log_months_worked_{ijk}) + \beta_4(D: country_k) + \beta_5(D: wave_{ijk}) + \left(\sum \beta_{nj k} x_{nij k}\right) + \left(\sum \beta_{nj k} x_{nj k}\right) + u_{ij} + \varepsilon_{ijk}$$

In Models 1a-1f, “ $\log\text{earn}_{ijk}$ ” refers to the natural logarithm of yearly earnings of individual i at time j in country k . In Models 1a-c, “ tempjob ” refers to whether an individual was employed on a permanent or fixed-term contract, and in Models 1d-f, “ Y1EC ” refers to whether individuals’ contract was permanent or fixed-term in the first year after unemployment. In all models, b_1 represents the earnings differential between temporary and permanent employees, “ $D:\text{wave}$ ” and “ $D:\text{country}$ ” represent the wave- and country-fixed effects, u_{ij} represents the unobserved time-invariant differences between individuals, and ε_{ijk} represents the individual-year-specific error term. In all models, a vector of time-variant country-level variables is added, containing GDP growth, the unemployment rate and the country-level proportion of temporary employment. In Models 1b, 1c, 1e and 1f, “ $\log_wrk\text{hours}$ ” and “ \log_months_worked ” represent the natural log of weekly work hours and months worked in the previous year, respectively. In Models 1c and 1f, a vector of covariates is added to control for individual characteristics (gender, education, occupational level, age, age squared, years in the labour market, household income, marital status, and household size). In addition, because in Model 1c the individual effects are fixed, the u_{ij} are controlled for. Naturally, this implies country-fixed effects (individuals in the dataset moving from one country to another were eliminated from the sample) and removes time-invariant individual characteristics from the model (e.g., gender).

In Model 2a the relationship between minimum wages and the raw yearly earnings differential for temporary employees (hypothesis 2a) is tested.

Model 2a

$$\log\text{earn}_{ijk} = \alpha + \beta_1(\text{mwlevel}_{jk} * \text{tempjob}_{ijk}) + \beta_2(D:\text{country}_k) + \beta_3(D:\text{wave}_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 2b

$$\log\text{earn}_{ijk} = \alpha + \beta_1(\text{mwlevel}_{jk} * \text{tempjob}_{ijk}) + \beta_2(\log_workhours_{ijk}) + \beta_3(\log_months_worked_{ijk}) + \beta_4(D:\text{country}_k) + \beta_5(D:\text{wave}_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 2c

$$\text{qrt1}(\log\text{earn}_{ijk}) = \alpha + \beta_1(\text{mwlevel}_{jk} * \text{tempjob}_{ijk}) + \beta_2(D:\text{country}_k) + \beta_3(D:\text{wave}_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 2d

$$\text{qrt1}(\log\text{earn}_{ijk}) = \alpha + \beta_1(\text{mwlevel}_{jk} * \text{tempjob}_{ijk}) + \beta_2(\log_workhours_{ijk}) + \beta_3(\log_months_worked_{ijk}) + \beta_4(D:\text{country}_k) + \beta_5(D:\text{wave}_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

This is achieved by adding a cross-level interaction between temporary employment and the minimum wage variable, together with country- and time-fixed effects and time-variant country-level controls. Next, in Model 2b, log weekly working hours and log months worked in the previous year are added to test hypothesis 2b. Additionally, it was argued that the effects proposed in hypothesis 2a and hypothesis 2b would be stronger in the bottom of the earnings distribution. Consequently, the relation between minimum wages and first-quartile earnings is estimated using quantile regression models: 2c estimates the relation between minimum wages and raw yearly first-quartile earnings, and 2d estimates the relation with hourly first-quartile earnings, i.e., by adding log weekly working hours and log months worked in the previous year. It should be noted that these quantile regression models do not account for the longitudinal nature of the data, and treat it essentially as a pooled cross-section. By violating the assumption of the independence of the observations, this may result in underestimated standard errors. The results are presented with cluster robust standard errors on the country level. Next to the variables explained in the previous paragraph, these models contain “mwlevel”, which refers to the level of the minimum wage per country.

To test the relation between collective bargaining and earnings differentials between temporary and permanent employees (hypothesis 3 and hypothesis 4), Model 3a is specified as the basic model for estimating the raw yearly differential, with cross-level interactions added between the coordination and extension variables and the temporary contract variable as well as country- and time-fixed effects and time-variant country-level controls. Next, in Model 3b, the log of weekly working hours and the log of months worked in the previous year are added to estimate the hourly earnings differential. Additionally, to assess whether the relation between earnings differentials and coordination and extension differ throughout the earnings distribution, quantile regression models are estimated: 3c to test the relation between coordination and extension and first-quartile yearly earnings and 3d to test the relation between coordination and extension and first-quartile hourly earnings. These models contain additional variables “coord” and “ext”, which are dummy variables for coordination and extension, respectively.

Model 3a

$$\logearn_{ijk} = \alpha + \beta_1(D.coord_{jk} * tempjob_{ijk}) + \beta_2(D.ext_{jk} * tempjob_{ijk}) + \beta_3(D:country_k) + \beta_4(D:wave_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 3b

$$\logearn_{ijk} = \alpha + \beta_1(D.coord_{jk} * tempjob_{ijk}) + \beta_2(D.ext_{jk} * tempjob_{ijk}) + \beta_3(\log_workhours_{ijk}) + \beta_4(\log_months_worked_{ijk}) + \beta_5(D:country_k) + \beta_6(D:wave_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 3c

$$qrt1(\logearn_{ijk}) = \alpha + \beta_1(D.coord_{jk} * tempjob_{ijk}) + \beta_2(D.ext_{jk} * tempjob_{ijk}) + \beta_3(D:country_k) + \beta_4(D:wave_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

Model 3d

$$qrt1(\logearn_{ijk}) = \alpha + \beta_1(D.coord_{jk} * tempjob_{ijk}) + \beta_2(D.ext_{jk} * tempjob_{ijk}) + \beta_3(\log_workhours_{ijk}) + \beta_4(\log_months_worked_{ijk}) + \beta_5(D:country_k) + \beta_6(D:wave_{ijk}) + \left(\sum \beta_{njk}x_{njk}\right) + u_{ij} + \varepsilon_{ijk}$$

To assess hypothesis 5a to 5c, the models are specified and estimated on a sample of individuals who were employed in wave t-1 and who suffered a spell of unemployment between wave t and t-1 (recorded in wave t) during which they received unemployment benefits. Model 4a is specified to assess the raw differential in unemployment benefits between temporary and permanent employees. Here, only the country and wave of the survey are controlled for. Second, Model 4b adds a vector of controls to Model 4a in order to control indirectly for an individuals' position in the income distribution and for time-variant country characteristics. Model 4c then adds a lagged log earnings variable to remove the effect of income differentials from the estimates, leaving a differential expectedly influenced by differences in the entitlement period only (recall how the UB variable captured differences in entitlements resulting from income differences and differences in the entitlement period). Model 4d adds an interaction with the dummy variable that measures whether the duration of benefits is conditional on the period of contribution. If differentials are smaller in countries with no conditional duration, this provides (indirect) evidence for of hypothesis 5c.

In these models, "UB" refers to the log of unemployment benefit entitlements as received in the year prior to the recording of the survey, and "l.temp" represents the lag of temporary employment. In Model 4b, a vector of covariates containing the lag of educational attainment, the lag of occupational level, the lag of working hours per week and months worked in that year, gender,

age, age squared, marital status and country-level controls for the growth of GDP and for the unemployment rate is added to 4a.

Model 4a

$$UB_{ijk} = \alpha + \beta_1(l.temp_{ijk}) + u_{ij} + \varepsilon_{ijk}$$

Model 4b

$$UB_{ijk} = \alpha + \beta_1(l.temp_{ijk}) + \left(\sum \beta_{nij}x_{nj}k\right) + \left(\sum \beta_{nj}kx_{nj}k\right) + u_{ij} + \varepsilon_{ijk}$$

Model 4c

$$UB_{ijk} = \alpha + \beta_1(l.temp_{ijk}) + \beta_2(l.logearn_{ijk}) + \left(\sum \beta_{nij}x_{nj}k\right) + \left(\sum \beta_{nj}kx_{nj}k\right) + u_{ij} + \varepsilon_{ijk}$$

Model 4d

$$UB_{ijk} = \alpha + \beta_1(l.temp_{ijk} * durdep) + \beta_2(l.logearn_{ijk}) + \left(\sum \beta_{nij}x_{nj}k\right) + \left(\sum \beta_{nj}kx_{nj}k\right) + u_{ij} + \varepsilon_{ijk}$$

Moreover, the individual covariates also contain a variable measuring the number of months the individual was unemployed in an attempt to control for structural differences in unemployment duration between permanent and temporary employees and the effects that has on the benefits received: permanent employees may receive fewer benefits as a result of being unemployed for a shorter period of time. In Models 4c-d, “l.logearn” refers to the lagged log earnings variable. All models are estimated twice: once on all individuals who were unemployed at any point between two waves and once on a subsample of individuals who were unemployed for more than three months. The reason for this is that for short durations of unemployment, an individual is likely to exit unemployment before benefits run out, which might cause an underestimation of the differentials in entitlements.

6.4. Results

The results of Models 1a-1f are shown in Table 6.4. The results from Models 1a, 1c and 1e provide support for hypothesis 1a by showing that the raw yearly earnings differential of temporary employees compared to permanent employees is negative in the first year of employment (1d) and without controlling for tenure (1a). Models 1b and 1e provide support for hypothesis 1b by showing that there exists a negative raw hourly earnings differential for temporary employees in the first year of unemployment and without controlling for tenure. Finally, Model 1c shows that there exists a negative true differential (of about 4%) when observed and unobserved heterogeneity is controlled for and without controlling for tenure.

Table 6.4: Relation between temporary contract and log earnings, distinguishing between any temporary contract (1a-1c) and temporary contracts in the first year after having been unemployed (1d-1f) (source: EU-SILC).

	(1a)	(1b)	(1c)	(1d)	(1e)	(1f)
	Log Earnings	Log Earnings	Log earnings	Log Earnings	Log Earnings	Log Earnings
Temporary contract	-0.388***	-0.182***	-0.0581*			
(ref: permanent job)	(-15.47)	(-7.31)	(-2.60)			
Y1EC: temp. contract				-0.265***	-0.104***	-0.0793**
(ref: perm. contract)				(-6.28)	(-3.71)	(-2.68)
Log weekly working hours		0.660***	0.255***		0.761***	0.685***
		(12.53)	(6.70)		(25.05)	(22.08)
Log months worked		2.681***	2.433***		2.842***	2.805***
		(19.22)	(17.71)		(13.62)	(12.85)
Age			-0.000153			0.0348*
			(-0.02)			(2.15)
Age (squared)			-0.0004**			-0.0004*
			(-5.30)			(-2.06)
Max educational attainment			0.00448			0.0617***
			(0.68)			(4.25)
Occupation level			0.0414***			0.0431***
			(4.56)			(5.89)
Female			0			-0.204***
			(.)			(-5.01)
Individual-fixed effects		yes				
Individual time-variant controls		yes		yes		yes
Country time-variant controls		yes		yes		yes
Country-fixed effects and wave dummies	yes	yes	yes	yes	yes	yes
N	221853	221853	221853	2634	2634	2634

t statistics in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Model 1f reinforces this by showing that this differential already exists in the first year after unemployment (about 6%), although this may be influenced by unobserved heterogeneity. Together, Models 1c and 1f provide support for

hypothesis 1c, although they are unable to fully untangle the effects of tenure and unobserved heterogeneity.

To facilitate interpretation of the results and to assess the actual financial vulnerability of temporary employees, Figure 6.1 shows the predicted mean raw earnings differentials of temporary employees by country as a percentage of permanent employees' earnings.

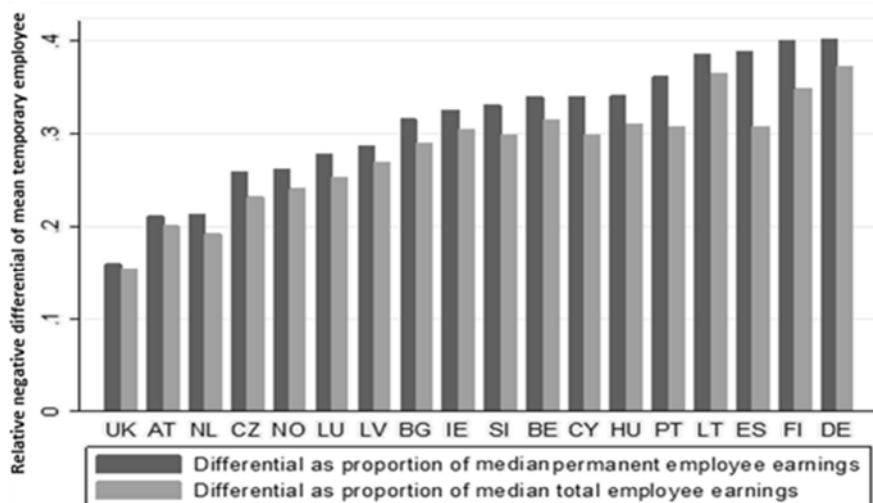


Figure 6.1: Earnings differentials of temporary employees, vis á vis permanent employees and the sample median (source: EU-SILC, 2004-2009).

These relative differentials are based on Model 1a and account for the effect of country characteristics only. They should thus be interpreted as the mean difference in temporary and permanent employees' earnings per country, including differences caused by the lower educational attainment of temporary employees, their tendency to be younger, etc. Figure 6.1 shows marked differences between the raw earnings of temporary and permanent employees, varying from 16% lower earnings for temporary employees in the UK, to 40% lower in Germany. Moreover, Figure 6.1 shows the differences between temporary employees' earnings and median earnings of all employees, regardless of the type of contract. Figure 6.1 shows that in countries on the right-hand side of the graph, the mean temporary employee has yearly earnings 30% lower than the sample median. This indicates that a significant proportion of temporary employees may have earnings that, following Chapter 2, would be considered precarious (i.e., 60% of median earnings). Naturally, however, these are gross earnings, so in countries with extensive redistribution, the picture for temporary employees might be less bleak.

To assess the effects of minimum wages, the results of Models 2a-d are shown in Table 6.5.

Table 6.5: Relation between minimum wages, being employed on a temporary contract and earnings (source: EU-SILC, Eurostat, ICTWSS database).

	(2a)	(2b)	(2c)	(2d)
	Log Earnings	Log Earnings	Log Earnings (qrt1)	Log Earnings (qrt1)
Temporary contract	-0.203	-0.105	0.0342	-0.139
(ref: permanent contract)	(-1.65)	(-0.89)	(0.13)	(-1.62)
Log monthly minimum wage	0.251	0.257+	0.462**	0.391*
	(1.83)	(1.68)	(2.79)	(2.20)
Temporary contract * Log monthly minimum wage	-0.0181	-0.0102	-0.0894*	-0.0117
	(-0.96)	(-0.56)	(-2.09)	(-0.92)
Minimum wage: no	3.388***	3.558***	3.179**	2.773*
(ref: Minimum wage: yes)	(3.86)	(3.63)	(2.69)	(2.19)
Temporary contract * Minimum wage: no	-0.152	-0.111	-0.900**	-0.243
	(-1.10)	(-0.82)	(-3.13)	(-1.35)
Log working hours/ months worked		yes		yes
Country time-variant controls	yes	yes	yes	yes
Country-fixed effects and wave dummies	yes	yes	yes	yes
N	197380	197380	197380	197380

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

First, as indicated by the temporary contract*log monthly minimum wage interaction in Model 2a, there exists no relation between the level of the minimum wage and the mean raw yearly earnings differential of temporary employees. This holds for the existence of a statutory minimum wage as well (Model 2a, temporary contract* minimum wage: no) and both hold for the hourly earnings differential (Model 2b). However, quantile regression model 2c shows that in the bottom quartile of the earnings distribution, the level of the minimum wage is negatively related to the yearly earnings differential, i.e., the negative yearly differential increases with increasing minimum wages. Although the hourly earnings of temporary and permanent employees in the bottom quartile increase with an increasing minimum wage, this increase is comparable for both groups, with no effect on the differential. These results provide support for hypothesis 2a

but not for hypothesis 2b and support the claim that high minimum wages lead to decreased employment levels in the bottom of the earnings distribution, but not to large changes in hourly earnings. Interestingly, the presence of a statutory minimum wage decreases the yearly earnings differential between temporary and permanent employees as shown in Model 2c, which may indicate a normative effect of having a statutory minimum wage. This is not explained by the theoretical framework, however, and is thus speculative.

To assess the relation between coordination in wage setting and earnings differentials, the results from Models 3a – 3e are shown in Table 6.6. Models 3a and 3b show that raw mean yearly and hourly earnings differentials between temporary and permanent employees are unaffected by the degree of coordination in wage setting as well as the degree to which collective agreements are extended. Conversely, there is some indication that high levels of coordination increase raw first-quartile earnings differentials, but given the absence of effects for other levels of coordination, this result may be incidental. This does not provide strong support for hypothesis 3. Model 3c shows that high levels of extension consistently decrease the raw first-quartile yearly earnings differential but, as Model 3d shows, leave the hourly differential unaffected. Because hypothesis 4 proposed a decrease in hourly differentials as a result of increased extension, Models 3c and 3d provide no support for this hypothesis. Apparently, the equalising effect of the extension of collective agreements manifests itself by decreasing differences in employment levels rather than through hourly wages.

With regard to differentials in unemployment benefit entitlements, in Table 6.7, the results from Model 4a-d are shown for the entire sample of individuals who were unemployed between two waves. Model 4a first shows that the raw differential in the unemployment benefits received by temporary employees is indeed negative. This is in line with the negative raw earnings differentials shown in previous models, and it provides support for hypothesis 4a and suggests an increased risk of precarious employment for temporary employees. Moreover, even after adding variables to control for an individual's position in the earnings distribution prior to unemployment, Model 4b shows a negative differential, providing additional support for hypothesis 5a.

Table 6.6: Relation between coordination in wage bargaining and the extension of collective agreements, temporary employment and earnings (source: EU-SILC, ICTWSS database).

	(3a)	(3b)	(3c)	(3d)
	Log Earnings	Log Earnings	Log Earnings (qrt1)	Log Earnings (qrt1)
Temporary contract (ref: permanent job)	-0.337** (-3.28)	-0.207 (-1.86)	-0.771** (-3.27)	-0.439 (-1.80)
Temporary contract * Coordination = 1	-0.0247 (-0.24)	-0.0551 (-0.51)	-0.0943 (-0.47)	-0.0763 (-0.49)
Temporary contract * Coordination = 2	-0.0102 (-0.10)	-0.0557 (-0.53)	-0.236 (-1.27)	-0.0714 (-0.47)
Temporary contract * Coordination = 3	-0.0304 (-0.29)	-0.0661 (-0.62)	-0.222 (-1.24)	-0.120 (-0.79)
Temporary contract * Coordination = 4	-0.108 (-0.95)	-0.0904 (-0.85)	-0.434* (-2.33)	-0.132 (-0.87)
Temporary contract * Extension = 1	0.0366 (0.55)	0.0965 (1.08)	0.311 (1.71)	0.313 (1.04)
Temporary contract * Extension = 2	0.0329 (0.36)	0.0943 (0.96)	0.478* (2.43)	0.304 (0.99)
Temporary contract * Extension = 3	0.0385 (0.49)	0.0884 (0.88)	0.419* (2.18)	0.321 (1.04)
Log working hours/ months worked		yes		yes
Country time-variant controls	yes	yes	yes	yes
Country-fixed effects and wave dummies	yes	yes	yes	yes
N	197380	197380	197380	197380

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Model 4c shows that earnings are positively related to benefits, as might be expected, and that controlling for earnings decreases the differential in benefits between temporary and permanent employees, though the differential remains significant. This indicates a negative differential resulting from temporary employees' shorter entitlement period, thus providing support for hypothesis 5b. Finally, the interaction between the lag of temporary employment and the conditional duration of benefits variable is non-significant. This indicates that temporary employees do not seem to be at an increased disadvantage when

entitlement periods are conditional on contribution histories, which does not provide support for hypothesis 5c.

Table 6.7: Relation between having been employed on a temporary contract and unemployment benefits, full sample (source: EU-SILC, MISSOC).

	(4a)	(4b)	(4c)	(4d)
	Log UB's	Log UB's	Log UB's	Log UB's
Lag temporary contract	-0.139***	-0.0785***	-0.0634**	-0.0177
(ref: permanent job)	(-4.45)	(-3.46)	(-2.61)	(-0.35)
Lag log earnings			0.196***	0.196***
			(5.35)	(5.39)
Lag temp. Job * Conditional duration				-0.0621
				(-1.03)
Individual time-variant controls		yes	yes	yes
Country time-variant controls		yes	yes	yes
Country-fixed effects and wave dummies	yes	yes	yes	yes
N	4932	4932	4932	4932

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

The results from Models 4a-d on the sample of individuals unemployed for more than three months are shown in Table 6.8. The results obtained from this subsample for models 4a-c are in line with results from the full sample. However, altering the sample in order to remove the short-term unemployed increases the size of the interaction of lag temporary employment and the conditional duration of benefits, making it significant. This likely results from the fact that benefits generally do not run out for individuals unemployed for less than three months, which strongly decreases the variation in entitlement periods that may be generated by a conditional duration. Ex-temporary employees unemployed for less than three months may have shorter entitlement period than similar permanent employees, but simply do not use up this period as a result of their short unemployment spell. Moreover, the results indicate that earning differences explain the full benefit differential in institutional systems without conditional duration, whereas systems with conditional duration add to those differences by making temporary employees entitled for a shorter period compared to permanent employees. This provides support for hypothesis 5c.

Table 6.8: Relation between having been employed on a temporary contract and unemployment benefits, subsample of individuals unemployed for more than three months (source: EU-SILC, MISSOC).

	(4a)	(4b)	(4c)	(4d)
	Log UB's	Log UB's	Log UB's	Log UB's
Lag temporary contract	-0.171***	-0.0692**	-0.0480	0.0323
	(-5.91)	(-2.88)	(-1.92)	(0.78)
Lag log earnings			0.218***	0.218***
			(5.35)	(5.42)
Lag temp. Job * Conditional duration				-0.109**
				(-2.17)
Individual time-variant controls		yes	Yes	yes
Country time-variant controls		yes	Yes	yes
Country-fixed effects and wave dummies	yes	yes	Yes	yes
N	2549	2549	2549	2549

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

6.5. Discussion

This chapter aimed to answer the overarching question of whether temporary employees are more financially vulnerable than permanent employees and whether they are at risk of precarious employment. This question was divided into two issues: do temporary employees 1) earn less than permanent employees and are these differentials influenced by institutions like minimum wages and collective bargaining, and 2) do temporary employees have lower unemployment benefit entitlements when unemployed and is this related to institutions? It was shown that temporary employees indeed tend to be overrepresented at the bottom of the earnings distribution, which is reflected in a negative raw earnings differential. Because fixing the individual effects showed a persistent negative differential, it is not likely that the differential is entirely attributable to characteristics of temporary employees, such as their socio-demographic profiles. It should be borne in mind however, that the analyses was not able to fully remove the possibility that temporary employees may accept a lower wage in the knowledge that, after having been screened, they will receive a raise to compensate. Rather, some of this differential is attributable to their comparatively short tenure and consequent inhibited wage growth on the one hand and, on the other, to employers' lower rewards for temporary employees

compared to permanent employees for performing the same tasks. Indeed, when only the first year of employment was assessed, thereby removing the tenure effect, temporary employees still exhibited lower earnings than permanent employees. This negative differential seems to indicate a discriminatory effect, although it should be noted that these latter results may be affected by unobserved individual-level heterogeneity, such as effort and ability. Additionally, these results may reflect the fact that temporary employment may serve as a device with which employers absorb volatility in the output market, but also as a device with which employers may screen potential employees (De Graaf-Zijl, 2012). These findings are in line with previous evidence on earnings differential and confirm the propositions of insider/outsider theory (Lindbeck & Snower, 1988) and theories of exploitation (Munoz de Bustillo, Fernandez-Macias, Igancio-Anton, & Esteve, 2011).

Because temporary employees are unevenly represented in different segments of the earnings distribution, it was assessed whether institutions that affect the earnings distribution affect the earnings differences between temporary and permanent employees. The degree of coordination of collective bargaining was unrelated to earnings differentials. Though neither minimum wages nor the extension of collective wage agreements seemed related to mean earnings differentials, they were shown to be related to first-quartile earnings differentials. That minimum wage levels were shown to increase the differential in yearly earnings between temporary and permanent employees while leaving the hourly differential unaffected implies that increasing minimum wage levels negatively affects temporary employees' employment in terms of the months worked per year and hours worked per week compared to permanent employees. This supports Neumark, Schweitzer, and Wascher's (2004) findings. Interestingly, the significant effect of the minimum wage dummy indicates an equalising effect of the mere existence of statutory minimum wages regardless of their *de facto* level. Apparently, the existence of statutory minimum wages seems to matter in itself for earnings differentials between temporary and permanent employees, which warrants further investigation. Additionally, results indicate that the extension of collective agreements decreases the raw yearly earnings differential in between temporary and permanent employees in the bottom of the earnings distribution. Though this supports the expected equalising effect of extension, these results show that this expected decrease in earnings differentials is the result of a convergence in the months and hours worked between temporary and permanent employees, rather than in their hourly earnings. In other words, the extension of collective agreements seems to have a positive employment effect but not necessarily a positive wage effect.

Finally, temporary employees were expected and shown to be at a disadvantage in obtaining unemployment benefit entitlements. This is partly a result of the negative raw earnings differentials temporary employees were shown to suffer. Additionally, however, temporary employees were shown to be

at a disadvantage in institutional systems where the duration of entitlements is conditional on the length of the period of employment before becoming unemployed. This is likely a result of the fact that temporary employees tend to have more fragmented employment trajectories (Chapter 4). These results support earlier results by Leschke (2006), who showed that rules and regulations concerning unemployment benefit entitlements discriminate against temporary employees in Spain, Denmark and Germany, where the duration of benefits is conditional on the period of contribution, but not in the United Kingdom, where benefit duration is not conditional on the length of the period of contribution.

This chapter shows that the characteristics of temporary employees, e.g., their socio-demographic characteristics, result in lower earnings than those of permanent employees. However, employers seem to add to this by rewarding temporary employees less than they reward permanent employees for similar tasks, although the models were unable to completely separate the influence of tenure from the true differential. Moreover, temporary employees have lower unemployment benefits than the unemployed do as a result of their lower earnings and shorter tenure. Defined as the insecurity in being able to obtain a minimum standard of decent living, this obviously feeds into precarious employment by not only making the employment of temporary employees insecure but also putting them at risk financially, at least more at risk than permanent employees. By showing the influences of minimum wages and the extension of collective agreements, this chapter shows that these effects are susceptible to policy and may be lowered. By carefully designing a minimum wage and enshrining it in law, governments may mitigate some of the financial inequalities that low-earning temporary employees may experience. Moreover, by extending wage agreements as a rule rather than an exception, governments and trade unions can contribute to lessening earnings differentials between temporary and permanent employees and again mitigate some of the inequalities in wages between temporary and permanent employees. A similar argument holds for inequalities in unemployment benefits. By designing unemployment benefits entitlements in a way that lessens the dependence of entitlements on characteristics of the employment trajectory in which temporary employees are at a disadvantage, policy-makers can lessen the discriminatory effects this has on the benefits of temporary employees.

Chapter 7

Conclusion

7.1. Flexible employment, precarious employees?

This dissertation aimed to answer the following question:

MQ: How is precarious employment explained by job-, employer- and institutional characteristics?

Precarious employees were defined as employees on numerically flexible contracts with low wages, a high risk of unemployment, low unemployment benefit entitlements, and a low supplementary income (Chapter 2). The focus of this dissertation was on numerical flexibility and its relation to wages, unemployment risks and unemployment benefits, while supplementary income was beyond the scope of this dissertation.

The main question was split into three sub-questions.

Q1: How are employers' decisions to offer numerically flexible contracts to employees explained by characteristics of the job, and how do institutions relate to these decisions?

Q2: How is employers' use of numerically flexible contracts related to their HRM attitudes?

Q3: How is employers' use of numerical flexibility related to precarious employment, and how do institutions mediate this relationship?

A body of literature has studied the relation between transaction costs and numerical flexibility, but few studies have directly observed the characteristics of the job, their relation to transaction costs, and how institutions may act upon this relationship. In this dissertation, it was shown how employees' risk of numerical flexibility is explained by the complexity of the jobs employees perform and the associated degree of autonomy and skill specificity (Chapters 3 and 4), and how this relation is influenced by the specifics of employment protection legislation (EPL) (Chapter 4). Additionally, research into how employers' Human Resource Management (HRM) attitudes relate to their decisions with regard to numerical flexibility is largely non-existent, which causes existing explanations of numerical flexibility to be unable to sufficiently explain variation in the use of numerical flexibility between employers. In this dissertation, it was shown how (HRM) attitudes with regard to consultation were related to employers' use of numerical flexibility (Chapter 5). Finally, although much scholarly and policy debate has been devoted to the risk of precarious employment created by numerical flexibility, empirical research into this issue has not moved far beyond analyses of earnings differentials between temporary and permanent employees. In this dissertation, it was shown how numerically flexible employees are at an increased risk of unemployment, low earnings and low unemployment benefits (Chapter 6). Before going into the implications of the findings, the main findings are summarised.

7.1.1. Job characteristics and numerical flexibility

The first research question addressed the link between job characteristics and numerical flexibility. To provide an answer to this question, in Chapters 1, 3 and 4, a transaction cost framework was proposed in which the outcomes in terms of numerical flexibility were linked to the implications that job characteristics have for the most efficient and effective way of governing the employment relation. Chapter 3 proposed that as jobs become increasingly complex in terms of the tasks associated with them, employers are increasingly likely to incorporate the performing employee into the organisational hierarchy (Campbell, 1988; Kalleberg, Reynolds, & Marsden, 2003; Masters & Miles, 2002). Indeed, the results showed that job complexity is negatively associated with the risk of a flexible or temporary contract. At the moment of hiring, however, the difference in the risk of numerically flexible employment between employees hired into low- and high-complexity jobs is relatively small, while this difference increases when employees stay in the organisation for a longer period of time. This indicates that sorting into contracts along the lines of job complexity happens for a large part after hiring, which indicates the incorporation of employees in complex jobs into the organisational hierarchy.

Following Breen's (1997) discussion of the interrelation between information asymmetries in principal-agent relations and employers' (in)ability to transfer risk to employees, it was proposed that increasing market volatility would drive employers to increase the use of numerical flexibility for employees in low-complexity jobs. This allows employers to minimise adjustment costs while keeping an optimal incentive structure. Seasonality was indeed shown to be positively related to the use of flexitime and temporary employment, but this is less true for employees in high-complexity jobs. Moreover, cyclicalities showed the expected negative interaction with job complexity, but it was shown on average to be related to a decreasing use of flexitime employment. Though Breen's (1997) framework can be used to explain the negative interaction between cyclicalities and job complexity, it fails to explain why increasing cyclicalities would lead to a lower overall use of numerical flexibility. An issue at play might be that the models used to estimate these effects did not include sector-fixed effects because the volatility indicators did not show variation over time. The analyses might consequently pick up some unobserved heterogeneity between sectors. Highly cyclical sectors, for instance, were shown to be mostly related to manufacturing, which contains jobs that are conducive to the build-up of firm-specific skills and traditionally show high levels of unionisation, which are both negatively related to employers' overall use of numerical flexibility (Kalleberg, 2011).

Chapter 4 relied on the same theoretical mechanisms as Chapter 3 but utilised a dataset that allowed for a direct operationalisation of autonomy and skill specificity. Though the main focus of Chapter 4 was on the institutional interactions with the mechanisms of specificity and autonomy, the average linear

effects of these variables strongly supported the proposition that skill specificity and autonomy are negatively related to the use of numerical flexibility. This further supports Breen's (1997) claims on the relation between information asymmetries and risk transfer, and supports some of the central arguments from transaction cost theory in general (Goldthorpe, 2000; Williamson, 1981). Additionally, it provides support for the theoretical mechanisms underlying the claims of Polavieja (2003) and Gebel and Giesecke (2011) that transaction cost mechanisms influence employers' decisions with regard to the jobs for which they offer numerically flexible contracts.

7.1.2. Institutions and numerical flexibility

Having shown that the transaction cost implications of job characteristics influence employers' decisions with regard to numerical flexibility, Chapter 4 proposed that Employment Protection Legislation (EPL) acts upon these mechanisms. This proposition was based on earlier research by Polavieja (2003) and Gebel and Giesecke (2011), who have been among the few to rigorously address the macro and micro interactions that generate differences in the allocation of temporary employment across countries. The theoretical framework proposed that the transaction costs associated with different types of jobs, and the procedural costs resulting from EPL act upon employers' cost-benefit analyses with regard to job-contract matches. In environments with a high relative deregulation of temporary employment, the low relative costs of temporary contracts increase the benefits of hiring employees with low transaction costs on temporary contracts, whereas the high relative costs of permanent employment increase the benefits of hiring high transaction cost employees on open-ended contracts. The results showed this to be the case when skill specificity was considered as the source of transaction costs but not when autonomy was concerned. Though this latter result requires further scrutiny, it could result from the notion that the strength of an open-ended contract as a commitment-eliciting device is relatively independent of the strength with which it is protected. The fact that an open-ended contract is generally more secure than a permanent contract may create the symbolic value needed for it to elicit commitment, while this symbolic value may not increase when the relative protection of the contract increases (as long as $EPL_p > EPL_t$).

Additionally, Chapter 4 showed that temporary employment has the tendency to trap employees in cycles of repeated temporary employment and to create a high risk of future unemployment. This trapping effect of temporary employment did not increase with the increasing protection of permanent employment. Together, the results from Chapter 4 indicate that the specifics of EPL influence the size and job structure of the temporary employed periphery of the labour market. Because temporary employment tends to trap individuals, EPL

is related to employees' risk of being trapped in temporary employment through its implications for the size and structure of the labour market's periphery. Apart from that, EPL is unrelated to the rate of transition between the core and periphery of the labour market itself.

7.1.3. Employers' HRM attitudes and numerical flexibility

In Chapter 5, employers' tendency to hire employees on numerically flexible contracts was addressed from a different perspective to shed some light on the poorly understood relation between employers' HRM attitudes and their contract decisions. The chapter combined psychological contract theory (Rousseau, 1989) and theories on managerial ideology and organisational culture (Geare, Edgar, & McAndrew, 2007; Goll, 1991). It was proposed that employers who have a unitarist view of employment relations and prefer including employees in the organisation are less likely to hire employees on numerically flexible contracts. Because these independent variables are difficult to measure directly, they were operationalised by assessing the extent to which employers are inclined to consult with their employees and the extent to which they communicate with their employees. Although the results were not overwhelming, they indicated a negative relation between employers' attitudes with regard to consulting their employees on organisational changes and their tendency to hire employees on numerically flexible contracts.

However, incorporating variables to reflect employers' HRM attitudes into models containing variables for the environment and personnel requirements of the organisation did not do much to increase the proportion of explained variance in numerical flexibility. Although this might call into question the appropriateness of assessing employers' HRM attitudes as a venue for explaining numerical flexibility, it should be considered that this particular venue is largely unexplored. No strong encompassing theoretical framework has been constructed from which to draw propositions and indicators. Moreover, the lack of focus on employers' HRM attitudes has resulted in a paucity of data on this issue. In Chapter 5, this paucity forced the analysis to rely on the observed behaviour and attitudes of employers, from which employers' ideology and attitudes with regard to psychological contracts had to be inferred. Because behaviour in particular is influenced by much more than ideology, these indicators inherently contain a large amount of noise. These issues should be addressed before arriving on a verdict on the potential of employers' preferences as an explanatory variable.

7.1.4. Precarious employment

In Chapter 2, precarious employment was defined as employees in insecure contract with low earnings, a high unemployment risk, low unemployment benefit entitlements and low supplementary income. Though supplementary income as an object of research was beyond the scope of this dissertation, Chapter 2 provided some evidence that numerically flexible employees tend to have an increased risk of low household income in the Netherlands. It should be noted, however, that this particular result lacked a theoretical basis and was purely inductive. The issue of numerical flexibility has been addressed in Chapters 3, 4 and 5. Chapter 4 showed how temporary employment relates to labour market attachment in terms of its implications for future risks of temporary employment and unemployment. Additionally, numerical flexibility was shown in Chapter 4 to generally not be a one-off event but rather tends to trap employees in cycles of temporary employment and unemployment. Increasing EPLp was shown to increase the size of the temporary segment but not the strictness of the separation between the core and periphery of the labour market, whereas increasing difference between EPLp and EPLt were shown to increase the tendency of low-specificity and low-educated employees to end up in the temporary segment.

With regard to inequalities in labour market attachment, the results of this dissertation are fairly unambiguous: low-skilled employees in low complexity jobs are at risk of temporary employment at any point in time, especially when permanent employment is strongly protected relative to temporary employment. Moreover, throughout their careers they are more at risk of temporary and unemployment. Following Chapter 2 and *ceteris paribus*, this means that the risk of precarious employment is highest amongst employees in low complexity jobs in countries with a strong protection of permanent employment relative to the protection of temporary employment.

It remained to be determined, then, to what extent these employees are at risk of having low earnings and low unemployment benefit entitlements. Chapter 6 aimed to address these issues. In Chapter 4, numerical flexibility was shown to be intimately and negatively related to skill specificity, autonomy and educational attainment, which directly suggests that numerical flexibility may be related to low earnings as well. In Chapter 6, it was proposed and shown that temporary employees have lower raw earnings than permanent employees, which translates into a lower disposable income. Indeed, a description of predicted raw earnings differentials showed that in many countries, significant proportions of the temporarily employed segment of the labour market are at risk of having a disposable income of less than 60% of the median. Moreover, controlling for unobserved heterogeneity showed that employers reward temporary employees less than they reward permanent employees, which was supported by a difference-in-difference analysis. However, these analyses were unable to fully

account for unobserved heterogeneity and differences in employment tenure. It was shown that statutory minimum wages might serve to decrease earnings inequalities between temporary and permanent employees in the bottom of the earnings distribution. However, high levels of minimum wages may result in fewer hours and months worked per year for temporary employees, resulting in an increase in earnings differentials. It was proposed that the characteristics of collective bargaining influence earnings inequalities by compressing the earnings distribution through coordination in collective bargaining and the extension of collective agreements. Here, only the latter effect was found, and it was only found in the bottom of the earnings distribution.

Additionally, Chapter 6 showed that temporary employees' low raw earnings feed into lower unemployment benefits, which puts them at a further risk of precarious employment. This is likely to be true in all European countries because everywhere, at least a part of unemployment benefit entitlements are proportional to past earnings. In some countries, however, this effect is likely stronger than others: in the United Kingdom, the strong means test in the income-related part of the Jobseeker's Allowance likely equalises the distribution of unemployment benefits, whereas in the Netherlands, the strong proportionality in the Dutch "Werkloosheidswet (WW)" puts low earners and thus temporary employees at a larger disadvantage. Finally, it was argued that when the duration of unemployment benefit entitlements is conditional on the period of contribution, temporary employees are at a disadvantage. This was indeed found amongst employees who were unemployed for more than three months. Though these findings need further scrutiny, they have clear implications for policy-makers, which will be discussed later.

7.1.5 The broader picture

In the theoretical framework in Chapter 1, it was proposed that the job characteristics that put employees at risk of numerical flexibility simultaneously increase their risk of running afoul of the other dimensions of precarious employment. This dissertation as a whole provides support for that proposition. Employees in low transaction cost jobs were shown to run an increased risk of marginal labour market attachment, an increased risk of low earnings and an increased risk of low unemployment benefit entitlements. Because the content of jobs is largely beyond the control of policy makers, this seems to imply an inability to reduce precarious employment. This dissertation shows that the way to reduce the risk of precarious employment in the labour market is through the careful design of institutions. By considering the effect that EPL has on the distribution of the risk of numerical flexibility, policy-makers could lessen the tendency of numerical flexibility to be concentrated amongst low transaction cost employees and thus reduce their risk of precarious employment. Additionally, by

considering the effect of institutions addressing the financial security of employees, policy-makers could weaken the relation between numerical flexibility and financial insecurity in the bottom of the earnings distribution and reduce the risk of precarious employment there. Specific recommendations for policy are formulated later in this chapter.

7.2 Implications and contributions

7.2.1. Separating the employee from the job

As outlined in Chapter 1, much research has focused on the relation between transaction costs and numerical flexibility (Emmenegger, 2009; Gebel & Giesecke, 2011; Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003; Masters & Miles, 2002; Polavieja, 2003). Prevalent in the literature on transaction costs and the employment relation is an inconsistency between the theoretical claim that job characteristics ultimately generate transaction costs (Goldthorpe, 2000) and the empirical assessment of that proposition by relying on indicators that confound job and employee characteristics (Masters & Miles, 2002). A first contribution made by this dissertation involves testing the relation between job characteristics and numerical flexibility directly.

The indicators of skill specificity and monitoring issues used by Masters and Miles (2002) rely on human resource managers' assessment of how long it would take to train a potential replacement for a specific job (transaction-specific investment) and on a series of statements indicating the extent to which performance can be measured (monitoring). Because they ask a respondent to evaluate the extent to which a job currently being performed in the company requires a long period of training or allows for monitoring, these indicators may confound employees' levels of skill (in the case of training periods) or their trustworthiness (in the case of monitoring and autonomy) with actual characteristics of the job, to which Williamson (1981) and Goldthorpe (2000) aimed to draw academic attention. This naturally matters for researchers ultimately interested in teasing out the causal linkage leading to numerical flexibility. Additionally, this feeds into a potential misspecification of the policies aimed at reducing the incidence of numerical flexibility: upskilling employees to make them less likely to be employed on a numerically flexible contract may be of limited value if their jobs do not change accordingly.

By relying on an *ex ante* and independent description of the tasks associated with a specific job, Chapter 3 improves on these indicators. Because it considers *ex ante* job descriptions, this indicator runs a far smaller risk of confounding employee and job characteristics and allows an observation of actual task characteristics associated with transaction cost outcomes. This indicator is less influenced by the possibility that the available pool of applicants for a certain job

possess the necessary level of skill to be trained effectively for that job or the possibility that the job has been performed by untrustworthy employees who require increased monitoring. Moreover, because it does not strongly reflect the particularities of the available pool of potential employees, this indicator is expectedly quite robust over time and between employers. By using an indicator that separates job characteristics from employee characteristics, the analysis in Chapter 3 improves on the state of the art by providing evidence that job characteristics are indeed related to employers' use of numerical flexibility. Future research should consider the theoretical and empirical separation of the job from the employee and aim to remove any inconsistency between job-level propositions and employee-level empirics.

7.2.2. Combining institutions and mechanisms

A second contribution of this dissertation is showing the importance of taking macro-level institutions into account when studying micro-level behavioural mechanisms, as advocated by Bol (2013). This finding contributed to the literature on labour market outcomes with regard to numerical flexibility by moving beyond the association with crude regime types. Moreover, it is a contribution to the study of cross-national variation in outcomes because it shows that institutional differences not only influence linear variation in outcomes but also non-linearities in these outcomes by influencing the mechanisms by which these outcomes are produced.

Much research to date has addressed the issue of cross-national variation in outcomes with regard to numerical flexibility by looking at the influence of regime types (Barbieri, 2009; Muffels & Luijkx, 2008), as proposed by the Varieties of Capitalism approach (Hall & Soskice, 2001) and the literature on welfare states (Esping-Andersen, 1990). Although the usefulness of these regime clusters as an analytical tool is not called into question here, they run the risk of confounding a large number of macro-level variables and thus to obscure predictors of labour market outcomes. Polavieja (2003) and Gebel and Giesecke (2011) have conducted excellent studies on the interaction between specific institutions and labour market outcomes, but this type of rigorous research on this topic is scarce. By moving beyond crude regime types to the actual study of how specific institutions influence labour market outcomes (Chapter 4), this dissertation added to a promising scholarly approach to labour markets.

As a contribution to research into cross-national variation in outcomes, this dissertation shows that differences in specific institutions may not only generate variations in outcomes; they also may generate non-linearities in these outcomes. Again in the footsteps of Gebel and Giesecke (2011), Chapter 4 showed that variation in Employment Protection Legislation not only affects micro-level risks and thus the macro-level aggregate prevalence of temporary employment, but

also the variation in the allocation of temporary employment along the lines of skill specificity and education. This contributes to the theoretical toolkit of scholars by suggesting that when taking into account institutional influences on micro-level outcomes, they carefully consider the mechanisms by which they expect these outcomes to come about. This also contributes to the empirical toolkit of scholars by showing the value of modelling cross-level interactions rather than macro-level relations.

7.2.3. Addressing employers

This dissertation aimed to open up a new field of research by addressing how employers' attitudes with regard to HRM may influence their tendency to hire employees on numerically flexible contracts (an exception is Geare, Edgar, & McAndrew (2009), who inspired Chapter 5 of this dissertation). By reviewing the literature on HRM attitudes and attempting to integrate this into a framework, this dissertation has shed light on a potentially promising but understudied explanation for numerical flexibility. Moreover, the observed relation between HRM attitudes with regard to consultation and employers' use of numerical flexibility provides a specific venue to explore for studies aiming to address the employer-side drivers of numerical flexibility.

As previously mentioned, many scholars have addressed micro-level influences on numerical flexibility, but research on actual employer-side drivers has not moved far beyond theories of adjustment costs and the quantitatively underexplored venue of institutional isomorphism (DiMaggio & Powell, 1983; Kalleberg, Reynolds, & Marsden, 2003). Theories on adjustment costs are strongly rooted in the assumption that firms have limited resources, which rational employers allocate as efficiently as possible. Consequently, employers' behaviour with regard to numerical flexibility in these theories is strongly determined by the availability of resources. Theories on institutional influences on numerical flexibility are less deterministic but still see employers severely constrained in their behavioural options. The fact that these theories allow for limited choices on the level of the employer seems at odds with the strong amount of variation in numerical flexibility that was shown to exist between employers. By accounting for employers' HRM attitudes in relation to their choices with regard to numerical flexibility, scholars are able to give a more encompassing account of variation in numerical flexibility. This dissertation has contributed to the study of the employer-side drivers of numerical flexibility by drawing attention to this potential field of research.

7.2.4. Conceptualising and studying precarious employment

A final contribution of this dissertation is to the existing literature on precarious employment. This literature has suffered from a lack of clarity regarding its central concept, which has resulted in an inability to measure precarious employment consistently and thus an inability to agree on the causes and consequences of precarious employment (Chapter 2). Because precarious employment has strong implications for insecurity, poverty, marginalisation and participation in society (Standing, 2011), these conceptual issues should be remedied to allow policymakers to address the consequences of precarious employment. This dissertation contributes to the study of precarious employment by giving the concept a firm theoretical basis and a stronger conceptualisation and by using this concept to provide a first analysis of the dimensions of precarious employment. Because the latter contribution has obvious implications for policy as well, the discussion will return to that issue later in this chapter.

In the literature on precarious employment, it has been quite common for scholars to equate precarious employment with numerical flexibility or at least to focus their empirical analysis on indicators of numerical flexibility (Kalleberg, 2011). This is understandable: earlier literature on precarious employment identified numerical flexibility as one of the main elements of precarious employment (Rodgers & Rodgers, 1989), and developments in the labour market since then have only increased the salience of that particular dimension. However, in their analyses, many scholars accept that precarious employment and numerical flexibility are not one and the same (Leschke & Keune, 2008). The existing confusion with regard to how precarious employment should be defined generates a too narrow approach in research on its causes and consequences. When researchers argue the detrimental consequences of precarious employment by solely relying on indicators of numerical flexibility, this unjustly stigmatises potentially enabling forms of numerical flexibility, such as self-employment or project-based work (Kalleberg, 2011). Moreover, definitions that are too broad allow researchers to make sweeping claims about the consequences of precarious employment without showing a strong empirical basis for these claims (Standing, 2011). Chapter 2 of this dissertation contributes to the study of precarious employment by offering a concept of precarious employment that has a solid theoretical basis and can be operationalised with many existing data sources. The discussion on the concept of precarious employment is likely to persist, but this dissertation offers a firm basis on which to constructively have that discussion.

Perhaps as a result of a lack of definitional clarity, not much research has systematically addressed the causes of precarious employment: research has traditionally focused mainly on the employees most likely to be precariously employed (Porthé, et al., 2010; Vosko, 2008). While some arguments are made concerning the causes of precarious employment, empirical evidence is often

descriptive and *ad hoc* (Kalleberg, 2011; Standing, 2011) Moreover, research into how institutional arrangements might be more or less conducive to precariousness is likewise scarce and *ad hoc*, although Leschke and Keune (2008) provide an informative exception. This dissertation showed how numerical flexibility is related to low earnings, how this relation can be mitigated by the minimum wage and the structure of collective bargaining, and how this may feed into unemployment benefit entitlements. By doing so, it contributed to literature on precarious employment in a manner that is open to falsification, the results of which can be unambiguously communicated to policy-makers.

7.3. Recommendations for future research

7.3.1. Theoretical recommendations

A main recommendation of this dissertation is informed by the observation from Chapter 5, which showed that estimating a model with a large number of variables that are considered theoretically relevant in explaining numerical flexibility explained only 25% of the variation in the use of numerical flexibility. Naturally, using higher quality data with which to operationalise existing theories would improve this proportion, but it is clear that there is much left to be discovered. Consequently, scholars need to continue building on their theoretical repertoire to offer increasingly accurate explanations of numerical flexibility and precarious employment. Here, three venues for further research are recommended.

First, future research should aim to increase the understanding of the causal mechanisms at work in allocating numerical flexibility. This dissertation aims to be a building block in a mechanism-based sociology of action, as mentioned in the introductory chapter. Because the results from Chapters 3 and 4 generally supported the proposed mechanism by which employers weigh the costs of numerical flexibility against its benefits, future research should derive predictions from this framework and test whether these indeed hold. Since the benefits of different types of contracts are generally expressed by the productivity of the employee, it would for instance be expected that changes in the productivity of specific employees influence their probability of being employed on a numerically flexible contract. Likewise, changes in the transactions costs associated with an employee's job should result in changes in their probability of numerical flexibility. By testing these and similar predictions, the proposed mechanisms can be scrutinized and causality be made more plausible.

Second, more dynamism should be brought into the transaction cost framework in order to further scrutinize the mechanisms at work. Crudely put, transaction costs are generally treated as inherent to a job, and the job as inherent to the product a company is aiming to manufacture or a service it is aiming to deliver. However, employers have a great deal of leeway in defining

jobs. Employers aiming to compete on costs may break down jobs into smaller jobs that may be partly automated and partly performed by a low-skilled employee who is easy to monitor and can thus be hired on a numerically flexible contract. An employer aiming to compete on quality, however, may decide to keep the task descriptions of jobs fuzzy to foster cooperation, innovation and quality control by the performing employees. These employees would require a great deal of autonomy and would thus work most efficiently on a permanent contract. However, the opposite probably occurs simultaneously: employers may have preferences about the use of numerical flexibility, which, if they honour these preferences, constrain them in their ability to define jobs in any way they see fit and ultimately in their choice of product-market strategy (see: Riley & Lockwood, 1997). These stylised examples imply a causal chain from employers' choice of product market strategy, the jobs they define, and consequently their use of numerical flexibility as well as from their preferences with regard to numerical flexibility, to the jobs they are able to design, and thus to the product market strategy they are most likely to adopt. Although progress is continually made, research has yet to do more than touch on these dynamics.

A third issue that should be addressed in the future pertains to the fact that research to date has generally treated employers and companies as relatively atomised: the influence employers may have on each other in their use of numerical flexibility is often neglected. However, if the plausible assumption is made that employers possess bounded rationality, they likely search for ways in which to reduce the uncertainty concerning the most efficient approach to numerical flexibility. In fact, in their discussion on institutional isomorphism, DiMaggio & Powell (1983) made a similar claim, and, as discussed, the results from Chapter 5 did indicate isomorphic mechanisms may be at work. Studying isomorphism requires research to investigate the networks companies belong to and how they draw information from these networks and interpret it to formulate preferences and a strategy for numerical flexibility.

7.3.2. Methodological recommendations

As any scholar attempting to address employers' motivations, attitudes and considerations with regard to employment relations can attest, better data are needed on employers. Following this dissertation, four recommendations are given to improve data sources on employers in the future.

First, Chapter 5 of this dissertation showed that there is a need for better data on employers' attitudes and practices. Although the European Company Survey has a number of indicators that measure employers' attitudes and practices, it is one of the few datasets that has this type of data on employers. Naturally, this issue results from the fact that these data have to be collected by interview or questionnaire, which is too time-consuming for many employers

(recall the low response rate for the ECS management questionnaire). This paucity of data should be improved upon in the future. Second, better indicators are needed on the level of the job. Although convenient, interviewing employers and employees on characteristics of jobs currently being performed in the company inherently confounds job with employee and employer characteristics. Based on the indicator used in Chapter 3, it is recommended that researchers interested in the relation between job characteristics and numerical flexibility utilise data on *ex ante* job descriptions. Third, data on employers are often cross-sectional, even though many of the questions researchers are interested in would benefit greatly from longitudinal data. The AVO data used in Chapter 3 of this dissertation is relatively rare in that it moves beyond the data found in tax records and still allows for some inquiry into dynamic mechanisms. Recall, however, that inferences with regard to dynamic processes in Chapter 3 had to be made on the basis of two waves of data per employer. Longer panels such as EU-SILC used in Chapter 4 and 6 generally contain no information on the employer. Longer panels of employers, preferably for different countries, would provide researchers with a dramatic increase in leverage over questions relating to the mechanisms by which outcomes with regard to numerical flexibility come about. A fourth and final recommendation would be to make better use of matched data, i.e., data on employees nested in employers, with information on both these levels of analysis. Matched data allow researchers to avoid ecological fallacies when drawing conclusions on the level of the employer: using the non-matched ECS data, a researcher that runs bivariate analyses may find that a high proportion of highly skilled employees in a company is related to a high proportion of numerically flexible employees. A naïve interpretation of this finding is that the highly skilled are more at risk of numerical flexibility, while an analysis of the nested AVO data would reveal the opposite. The detected relation is thus likely due to employers' tendency to utilise a buffer of flexible employees to protect their high-skilled employees against market volatility. Only matched data provide empirical clarity on this issue.

Together, these data improvements would greatly enable researchers to investigate precarious employment, which is a concept influenced by institutional, job, employer and employee characteristics. Longitudinal matched data with a sufficient level of detail would allow researchers to link jobs to contracts and wages when employees are active in a company and to unemployment thereafter. Moreover, it would allow researchers to accurately and dynamically identify employer-side drivers of numerical flexibility and precarious employment and ultimately allow policy-makers to adequately address it.

7.4. Policy implications and recommendations

Although it recognises that numerical flexibility may be important with regard to competitiveness and labour market adjustment, the OECD recently wondered to what extent the risks these contracts entail have been unequally distributed over the labour market (OECD, 2014). Simultaneously, the OECD worried about the risks that numerically flexible contracts carry for employees in terms of wages and unemployment, acknowledging a growing risk of precarious employment as defined in this dissertation. The OECD follows up on this assessment with a number of policy recommendations. Here, the OECD's policy recommendations are discussed in light of the results of this dissertation and with the aim of reducing the incidence of precarious employment.

7.4.1. Employment protection legislation

The main goal the OECD aims to achieve with its policy recommendations is the reduction of labour market segmentation, which is detrimental from both an equity and an efficiency viewpoint (OECD, 2014). The OECD proposes to reduce segmentation through changes in Employment Protection Legislation because it identifies the divergence of regulations regarding permanent and temporary contracts (EPLp and EPLt, respectively) as an important culprit in fostering labour market segmentation. To achieve convergence in EPLp and EPLt, the OECD discusses the policy options of (1) increasing the protection of temporary employment, (2) decreasing the protection of permanent employment, (3) the creation of a "single employment contract", and (4) the creation of a "unified employment contract". Based on Figure 4.1 in Chapter 4, the OECD is right to be cautious in increasing the protection of temporary contracts. Though such a change would foster convergence in the costs of temporary and permanent contracts in many countries, Chapter 4 suggests that it would have a limited effect on the probability of temporary employment for lower-skilled employees and thus on precarious employment, while it would reduce the labour market's capacity for adjustment.

Especially from an equity viewpoint, the reduction of the protection of permanent employment has stronger and more desirable effects: reducing EPLp reduces the aggregate incidence (and thus individual-level probability) of temporary employment and allocates the probability of temporary employment more indiscriminately over the skill distribution. The result would be a lower incidence of precarious employment. However, caution should be taken when deregulating the protection of permanent employment. Some protection of permanent employees is likely to increase the productivity in this group by fostering organisational commitment. This "higher status" of the permanent contracts likely causes it to reinforce the employment relation and to be a catalyst for beneficial reciprocity between employer and employee, as argued in Chapter

5. Moreover, permanent contracts allow employers and employees to solidify the employment relations long enough to make the investment in firm-specific skills viable. Though somewhat overused as an example of labour market policy gone right, the success of the German *Mittelstand* is due in no small part to the high level of firm- and industry-specific investments enabled by job security.

The OECD expands on the idea of fostering convergence between contract types by discussing the possibility of a “single” contract (OECD, 2014). A single contract would effectively abolish temporary and permanent contracts in favour of one type of contract that has its protection discretely or continuously increase with tenure. The discrete single contract would essentially be an open-ended contract with an “entry phase” with lower dismissal costs and a “stability phase” with higher dismissal costs. From the point of view of precarious employment, the discrete single contract would improve little on the current situation with differently protected permanent and temporary contracts. Sorting into the stability phase after the entry phase would still happen along the lines of skill and job characteristics, in line with the difference in protection between the entry and stability phases. Moreover, the entry phase would remain a predictor of future entry phases and unemployment and would likely be associated with low earnings and higher unemployment risk.

By replacing any distinction between “phases” through continuously increasing severance payments with tenure, the continuous single contract seems more promising. In line with Chapter 4, it would be expected that under continuous arrangements, employers would dismiss employees at the point in time in which their severance payments would begin to outstrip their marginal product. This would result in a longer tenure for employees of increasing skill, in line with the current situation. However because employers have no clear moment for an “in or out” decision, they would expectedly postpone replacing employees they know with employees they do not know, given that they have incomplete information on the costs and benefits of doing so. Consequently, employees of all levels of skill may be better off. Additionally, postponing or preventing their dismissal would become a strong incentive for employees to increase their productivity, which does not exist when a transition into permanent employment is all but impossible: the continuous arrangement provides an effective “carrot and stick” incentive that is gradually replaced by a psychological contract. It should be noted, however, that the OECD (2014) is right in warning against the negative effects the continuous single contract has on labour market adjustment, turnover and entry. During periods of economic growth and labour market tightness, employers will forego dismissing employees which leads to high dismissal costs when the economic situation deteriorates. This would lead to long periods of adjustment and potentially to lower levels of employment, specifically among labour market entrants.

The unified contract would essentially tweak the idea of continuous single contracts by maintaining the distinction between temporary contracts and permanent contracts with dismissal costs increasing from a lower level for temporary contracts compared to permanent contracts. This would result in labour market segmentation in line with the difference in the protection of both types of contracts. If however, as would be expected following the discussion on the single contract, the temporary unified contract would result in longer tenure than a regular temporary contract, the relation between this segmentation and precarious employment would be weaker. While being less effective in eliminating labour market segmentation than the single contract, by allowing employers to maintain a flexible buffer, the unified contract is more conducive to labour market adjustment. Again, this is dependent on whether and at what level the increase in protection is capped. Although it is reiterated that designing such a cap is difficult, following this dissertation it is recommended that the cap for the permanent unified contract is not too high as compared to the cap for the temporary unified contract.

Given the potentially adverse labour market effects of the continuous single contract and the political challenges involved in introducing it (OECD, 2014), it is recommended that policymakers explore the unified contract. The unified contract maintains the distinction between temporary and permanent contracts but has the protection of these contracts increase with tenure to lessen labour market segmentation and thus precarious employment. It is, however, recommended that policymakers put a cap on this increase in protection. This cap should reflect a level of protection of permanent and temporary contracts where permanent contracts still provide the security to foster commitment and firm-specific skill investments, but are not so well protected to cause the low-skilled to become trapped in the temporary periphery of the labour market. The positive effects of these changes are most likely to be significant where the protection of permanent contracts is currently relatively strong, such as in some Southern and Continental European countries. Because it is not recommended to eliminate the differences between the protection of temporary and permanent contracts altogether and because other influences likely act on the relation between numerical flexibility and earnings as well (see Chapter 6), some degree of concentration of numerical flexibility at the bottom of the earnings distribution is likely to persist. Because this concentration is conducive to precarious employment, the next section recommends policy measures that alleviate the financial vulnerability of numerically flexible employees.

7.4.2. Financial risk and redistribution

As Figure 6.1 showed, temporary employees have a strong tendency to be located in the bottom of the earnings distribution. As an unweighted country average, the

mean temporary employee tends to earn 30% less than the country-specific median gross raw earnings (based on Figure 6.1), that is, before taxes and without controlling for the hours worked, months worked, educational attainment, etc. Assuming that a large proportion of temporary employees do not have a large secondary income with which to augment their household income, this puts them at risk of precarious employment, which is defined by earnings of less than 60% of the median. The first of three ways to improve this situation has already been discussed: lowering the protection of permanent employment in environments where it is high creates a weaker tendency for temporary employment to be allocated along the lines of skill, which leads to a lower tendency of temporary employment to be concentrated in the bottom of the earnings distribution. A second way of improving this situation is by equalising the earnings distribution through labour market policy, and a third way is through the translation of gross earnings to net earnings, i.e., through progressive taxation and redistribution.

The relation between the relative earnings of temporary employees and institutions that influence the earnings distribution has been discussed in Chapter 6. Minimum wage legislation can decrease earnings inequality between temporary and permanent employees, but it should be treated with caution. Earlier research and Chapter 6 show that the employment levels of temporary employees in the bottom of the earning distribution and thus raw earnings are negatively related to increasing minimum wages, even though having a statutory minimum wage in itself decreases earning differentials. From the point of view of decreasing earnings inequality, it is thus recommended to formalise minimum wages but to not make them so high as to stifle employment rates amongst temporary employees in the bottom of the earnings distribution. Additionally, extending collective wage agreements over the labour market indiscriminately of type of contract is recommended, as it has an equalising effect on the earnings of temporary and permanent employees. It should be noted, however, that the implementation of such a policy likely requires a high level of coordination in collective bargaining, between a strong union and employers' organisation.

Because this dissertation did not address the issue of redistribution directly, this issue will only be discussed as it pertains to the redistribution of earnings from employees to the unemployed, i.e., through unemployment benefit entitlements.

7.4.3. Unemployment benefits and employability

Because numerically flexible employees were shown to have a higher risk of unemployment than permanent employees, unemployment benefit entitlements should be designed with the particular employment trajectories of numerically flexible employees in mind. Although unemployment benefits based on insurance principles are common throughout Europe (Leschke, 2006), they were shown to discriminate against temporary employees by penalising them for their

fragmented employment trajectories, especially when entitlements are conditional on the period of contribution. To mitigate the effect of the inherent inequality in the employment trajectories of temporary and permanent employees on benefits, policymakers would do well to move away from strict insurance principles and to move towards more universalist or hybrid systems.

Naturally, universalist systems are either expensive or provide relatively low net benefits, but it seems unfair to resolve this problem by economising on the benefits of those who are most likely to need them. This is especially true when considering that numerically flexible employees' higher unemployment risks are inherent to the needed labour market flexibility these employees provide, from which all participants in the labour market are expected to benefit. Here, a role for redistribution is recommended. By levying relatively progressive taxes and redistributing the income from these taxes towards the unemployed, governments should be able to maintain a decent level of unemployment benefits. At the same time, high earners are free to prop up their benefits with private savings, or governments may supplement the universal leg of unemployment benefits with an insurance-based leg. All that is needed to prevent precarious employment is a sufficiently generous universal leg. Here, the OECD's (2014) suggestion that employers contribute to employees' benefit entitlements seems promising because it mutualises the costs of unemployment over employers and employees, granting all a stake in preventing it.

Naturally, generous unemployment benefits come with the well-known consequence of raising reservation wages, which discourages the unemployed from accepting jobs and thus puts extra financial pressure on the system. The issue of reservation wages and the high unemployment risk of numerically flexible employees are two reasons why policy should be geared towards activating the unemployed as well. To reduce the duration of unemployment spells, the unemployed should be encouraged to continually improve their labour market position through upskilling or reskilling. This approach aims to secure a set of skills that will help the unemployed to re-enter the labour market either by improving on their existing set of skills or by acquiring a new set of skills that is in higher demand. This is a double-edged sword with regard to precarious employment: it simultaneously results in shorter unemployment spells, and it allows employees to gear their skill sets to jobs and occupations that are more likely to result in a permanent contract and higher wages in the future. As shown in Chapter 4, for the latter recommendation to work, however, the protection of permanent employment should not be so extreme as to require an unfeasible degree of upskilling. As a general conclusion, the policy recommendations proposed here would work most effectively when implemented simultaneously.

7.4.4. *A final observation*

To some extent, the results from this dissertation point to an overarching observation: institutions that differentiate between labour market participants based on characteristics of the employment relation or those that allow for such a differentiation tend to do so at the detriment of numerically flexible employees. This is not a law of nature but arguably an outcome of a process by which these institutions were geared towards dealing with the historically regular permanent employment relationship. To lessen financial inequalities in the labour market that exist along the lines of the type of contract, institutions designed to influence the earnings distribution should be made to encompass all employees. Employment Protection Legislation may differentiate between temporary and permanent employment, but this differentiation should be limited to prevent the existence of harmful inequalities in the risk of temporary employment. Moreover, earnings inequalities between temporary and permanent employment should be limited, by way of automatic extension in the case of wage agreements, by codification in the case of minimum wages, or by making the employment trajectory less influential in determining unemployment benefits. By limiting the inequalities between numerically flexible and permanent employees, the risk of precarious employment may be reduced and marginalisation prevented.

Appendix

Appendix A: Descriptive statistics for Chapter 3

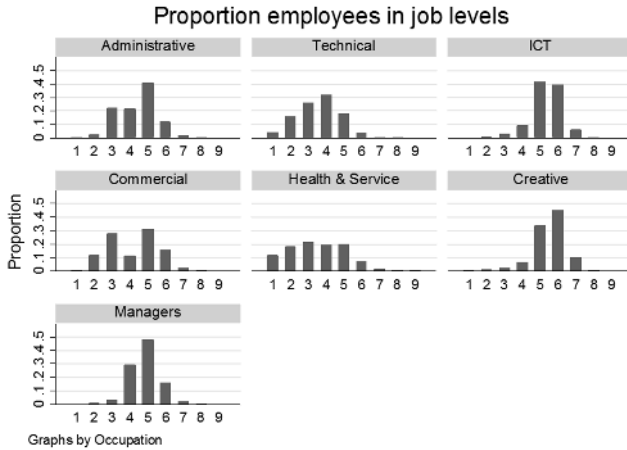


Figure A.1: The proportion of employees in different job levels, by occupation. Data: Arbeidsinspectie, Arbeidsvoorwaardenonderzoek.

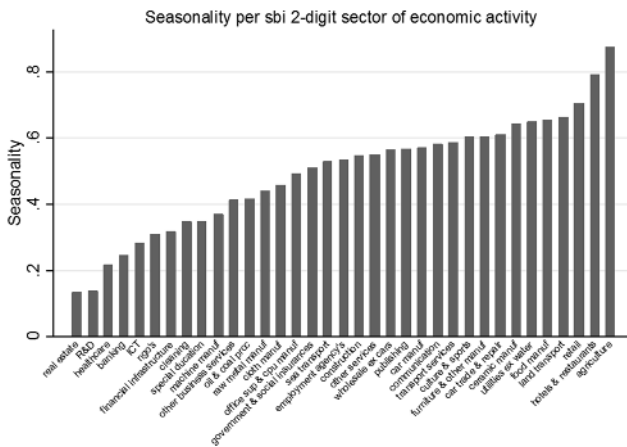


Figure A.2: Seasonality by 2-digit sector. Data: “Organisatie voor Strategisch Arbeidsmarktonderzoek vraagpanel” (OSA demand-panel).

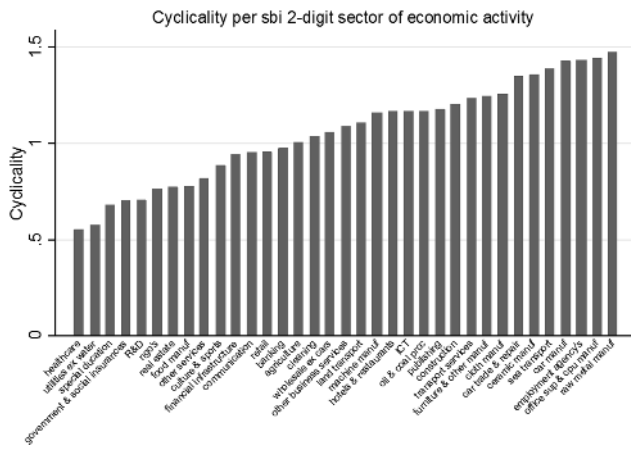


Figure A.3: Cyclicality by 2-digit sector. Data: "Organisatie voor Strategisch Arbeidsmarktonderzoek vraagpanel" (OSA demand-panel).

Appendix B: The theoretical framework of Chapter 4 formalised

Hypothesis 1a and 1b

Following standard economic assumptions, employers hire an employee when the marginal revenue product (MRP) of an employee is larger than the marginal costs (MC) of employing them:

$$MRP > MC \quad (1)$$

In that vein, it proposed that employers hire an employee on a permanent contract when the difference in the MRP between employing them on a permanent contract (MRP_p) or on a temporary contract (MRP_t) is larger than the difference between marginal cost of employing them on a permanent contract (MC_p) or a temporary contract (MC_t). Here, MC_p and MC_t are considered to be positively related to EPL_p and EPL_t , respectively.

$$MRP_p - MRP_t > MC_p - MC_t \quad (2)$$

Where it is assumed that at all times:

$$MRP_p > MRP_t \quad (a)$$

$$MC_p > MC_t \quad (b)$$

In terms of productivity, the benefits of eliciting commitment by using a permanent contracts are expected to be stronger for increasing autonomy. Likewise, the benefits of incorporation into the organisation in terms of (future) productivity are larger for employees with highly firm-specific skills. Consequently, the MRP of a permanent contract increases with increasing autonomy and skill specificity.

$$\frac{\Delta(MRP_p)}{\Delta autonomy} > 0 \ \& \ \frac{\Delta(MRP_p)}{\Delta specificity} > 0 \quad (3)$$

Where (3) should be interpreted as “the change in MRP_p , as a result of a positive change in autonomy, or skill specificity, is larger than 0 and *vice versa*”, or as a positive correlation. Temporary contracts on the other hand, are expectedly detrimental to the efforts of employees, with the negative productivity effects increasing with increasing autonomy. Moreover, temporary contracts increase the likelihood of employees with firm-specific skills exiting the organisation, which leads to reduced (future) production.

$$\frac{\Delta(MRP_t)}{\Delta autonomy} < 0 \ \& \ \frac{\Delta(MRP_t)}{\Delta specificity} < 0 \quad (4)$$

The positive change in MRP_p and the negative change in MRP_t as a result of a positive change in autonomy or specificity cumulatively increase the difference between these values, as shown in (2), for increasing autonomy.

$$\frac{\Delta(MRP_p - MRP_t)}{\Delta autonomy} \gg 0 \ \& \ \frac{\Delta(MRP_p - MRP_t)}{\Delta specificity} \gg 0 \quad (5)$$

For now, it is assumed that differences between MC_p and MC_t are constant and that, following (b), this difference is positive.

$$MC_p - MC_t = c > 0 \quad (c)$$

For low autonomy or specificity, it is proposed that the productivity gains generated by offering a permanent contract are less than the costs of doing so.

$$MRP_p - MRP_t < MC_p - MC_t \quad (6)$$

While for high autonomy or specificity the opposite holds.

$$MRP_p - MRP_t > MC_p - MC_t \quad (7)$$

(6) and (7) combine to yield hypothesis 1a and hypothesis 1b:

H1a: The more autonomy is required to perform a job, the less likely it is that the employee performing the job is employed on a temporary contract

H1b: The more firm-specific skills are required to perform a job, the less likely it is that the employee performing the job has a temporary contract

Hypothesis 2a and hypothesis 2b

When (c) is relaxed, MC_p can increase relative to MC_t . Since MC_p is influenced by EPL_p , an increase in MC_p is related to an increase in security for the employee. Likewise, decreasing MC_t is related to less security. It is proposed that increasing security generates increasing commitment and thus an increasing MRP . Consequently, an increasing relative deregulation increases MRP_p and decreases MRP_t .

$$\frac{\Delta MRP_p}{\Delta(MC_p - MC_t)} > 0 \quad (8)$$

$$\frac{\Delta MRP_t}{\Delta(MC_p - MC_t)} < 0 \quad (9)$$

Since (8) and (9) define opposite pressures on the difference in MRP between permanent and temporary contracts as a result of relative deregulation, this difference increases strongly under increasing relative deregulation.

$$\frac{\Delta(MRP_p - MRP_t)}{\Delta(MC_p - MC_t)} \gg 0 \quad (10)$$

Since (5) still holds, autonomy, or skill specificity, and the relative deregulation of temporary employment simultaneously influence MRP differences. For any given value of autonomy then, it is expected that the relative deregulation of temporary employment positively and multiplicatively affects existing MRP differences.

$$\begin{aligned} \frac{\Delta(MRP_p - MRP_t)}{\Delta autonomy} * \frac{\Delta(MRP_p - MRP_t)}{\Delta(MC_p - MC_t)} \gg 0 \quad \& \\ \frac{\Delta(MRP_p - MRP_t)}{\Delta specificity} * \frac{\Delta(MRP_p - MRP_t)}{\Delta(MC_p - MC_t)} \gg 0 \quad (11) \end{aligned}$$

For low autonomy then, an increase in the relative deregulation of temporary employment “reinforces” the temporary contract decision by magnifying the MRP-difference underlying that decision. Differently put, for low autonomy or specificity a positive change in the relative deregulation of temporary employment increases the MRP-difference less than the difference in MC.

$$\frac{\Delta(MRP_p - MRP_t)}{\Delta(MC_p - MC_t)} < \Delta(MC_p - MC_t) \quad (12)$$

While for high autonomy or specificity, the opposite holds.

$$\frac{\Delta(MRP_p - MRP_t)}{\Delta(MC_p - MC_t)} > \Delta(MC_p - MC_t) \quad (13)$$

The contract decision is considered probabilistic, with the probability of an employee being offered a temporary contract positively related to the difference in the difference between MRP_p and MRP_t , and MC_p and MC_t .

$$\frac{\Delta p(temp=1)}{\Delta((MRP_p - MRP_t) - (MC_p - MC_t))} < 0 \quad (14)$$

Following (14), an increase in the probability of a temporary contract for low autonomy and in the probability of a permanent contract for high autonomy or skill specificity results from an increase in the relative deregulation of temporary employment. This is expected to lead to a clustering of permanent contracts at high autonomy or specificity and of temporary contracts at low autonomy or specificity. This yields hypothesis 1b.

H2a: The negative relationship between autonomy and the risk of temporary employment is stronger in environments where the relative difference between

the procedural costs associated with temporary and permanent contracts is larger.

H2b: The negative relationship between asset specificity and the risk of temporary employment is stronger in environments where the relative difference between the procedural costs associated with temporary and permanent contracts is larger.

Appendix C: Descriptives of the main independent variables in Chapter 4

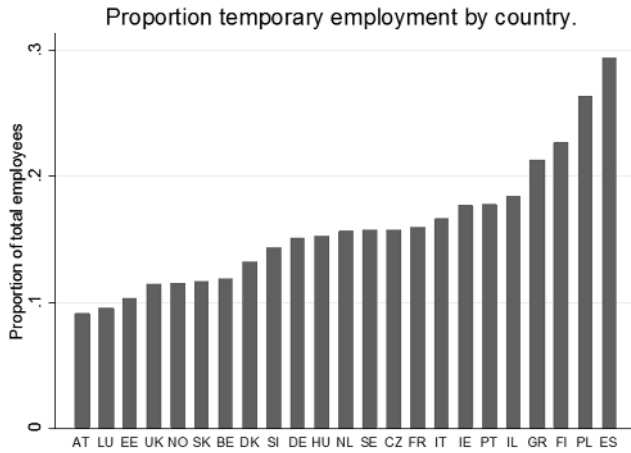


Figure C.1: Proportion temporary employees by country, as measured in a pooled cross-section of wave 2 (2004) and 5 (2010) of the European Social Survey.

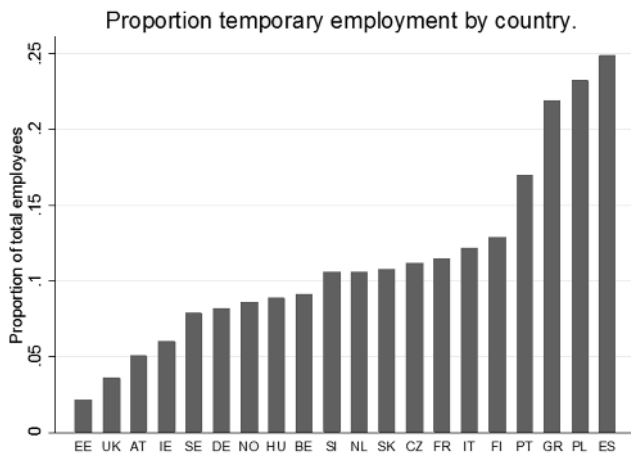


Figure C.2: Proportion temporary employees by country, as measured in a pooled cross-section of waves 2004-2009 in EU-SILC.

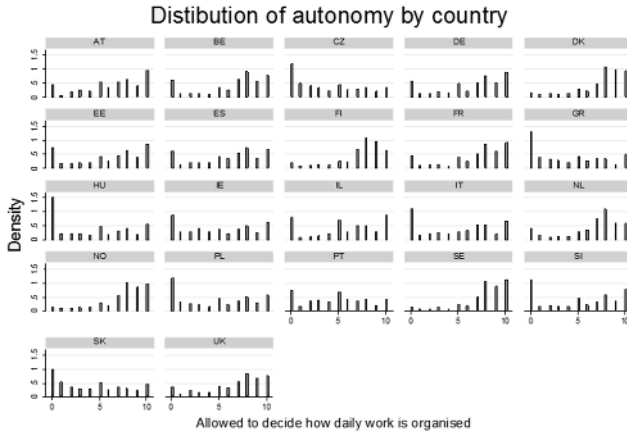


Figure C.3: Density distribution of autonomy per country. 0 refers to “no influence at all”, 10 refers to “complete control” (source: European Social Survey, 2004/2010).

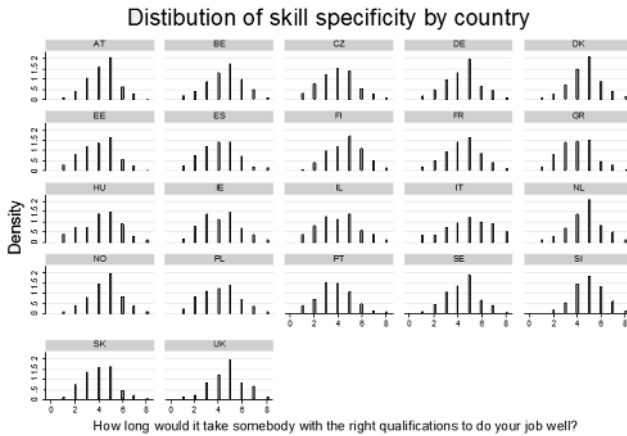


Figure C.4: Density distribution of specificity per country. 1 refers to 1 day or less, 2) 2-6 days, 3) 1-4 weeks, 4) 1-3 months, 5) more than 3 months, up to 1 year, 6) more than 1 year, up to 2 years, 7) more than 2 years, up to 5 years, 8) More than 5 years (source: European Social Survey, 2004/2010).

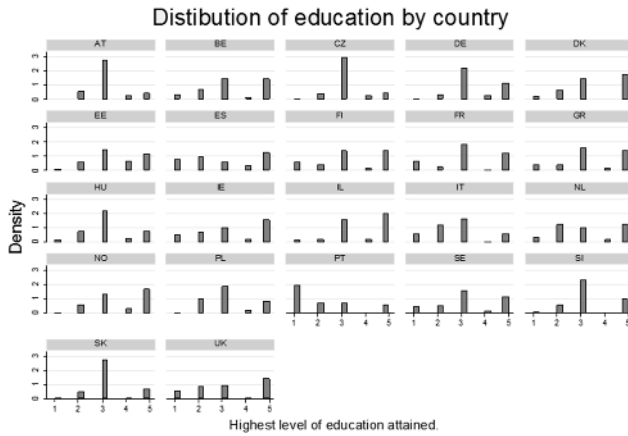


Figure C.5: Density distribution of educational attainment (ISCED) by country (source: European Social Survey, 2004/2010).

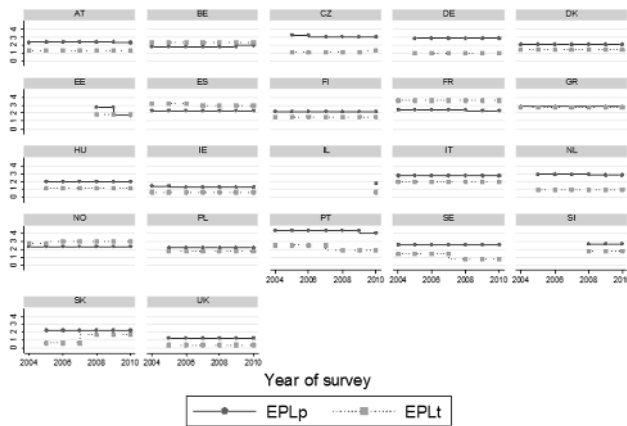


Figure C.6: OECD indicators for the protection of permanent (EPLp) and temporary (EPLt) employment plotted for the period 2004 – 2010.

Table C.1: Pairwise correlations between skill specificity and education, autonomy and education, and skill specificity and autonomy (source: ESS, wave 2 and 5).

	Skill specificity	Autonomy	Education
Skill specificity	1.00		
Autonomy	0.27	1.00	
Education	0.24	0.28	1.00

Appendix D: Descriptives of the control variables in Chapter 4

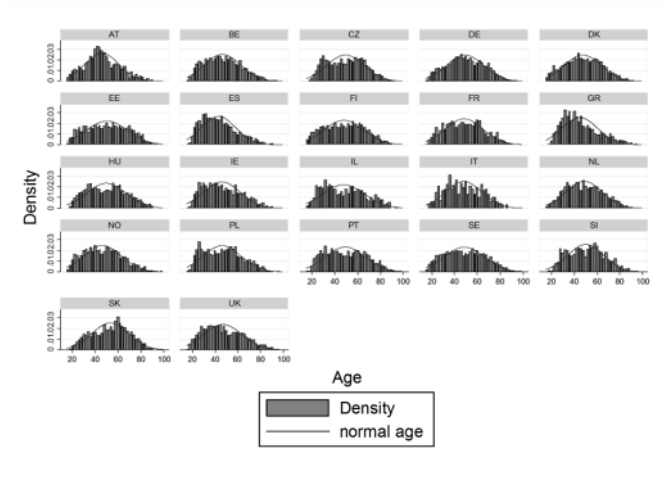


Figure D.1: The distribution of age in the sample (source: ESS, wave 2 and 5).

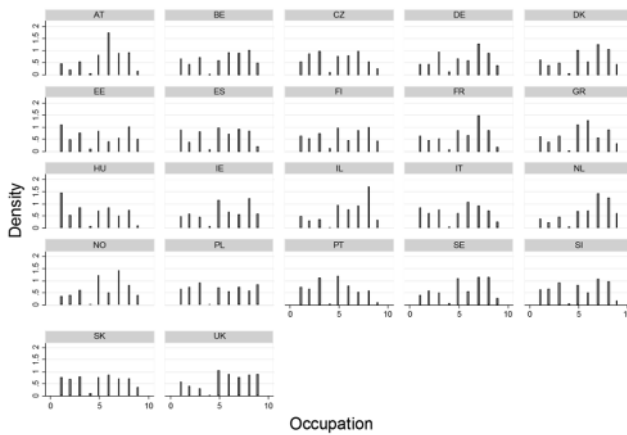


Figure D.2: The distribution of occupation level in the sample (source: ESS, wave 2 and 5).

Table D.1: Categories of occupation and associated code (source: ESS, wave 2 and 5).

Code	Description
1	Legislators, sr officials, managers
2	Professionals
3	Technicians and professionals
4	Clerks
5	Service and sales
6	Skilled agricultural
7	Craft and trades
8	Plant and machine
9	Elementary

Table D.2: Proportion of employees having been unemployed for more than three months, per country (source: ESS, wave 2 and 5).

Country	Percentage ever unemployed > 3 months
AT	24.71%
BE	29.29%
CZ	21.39%
DE	27.69%
DK	29.74%
EE	31.30%
ES	39.07%
FI	35.48%
FR	43.50%
UK	19.23%
GR	33.60%
HU	40.24%
IE	19.78%
IL	19.12%
IT	29.21%
NL	20.78%
NO	21.98%
PL	39.49%
PT	22.51%
SE	28.64%
SI	28.57%
SK	28.91%
Grand mean	28.83%

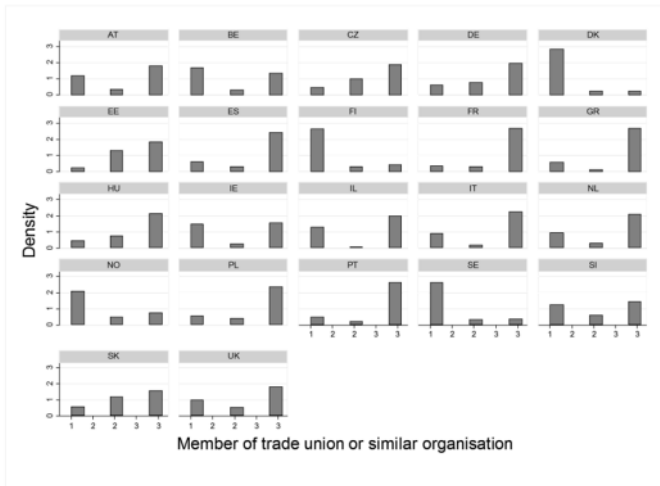


Figure D.3: Distribution of employees over union membership (1= yes, currently a member, 2 = yes, previously, 3 = No) (source: ESS, wave 2 and 5).

Table D.3: Proportion of employees member of a union (source: ESS, wave 2 and 5).

Member of a union or similar trade organisation?			
	Freq.	Percent	Cum.
Yes, currently	8476	38.27	38.27
Yes, previously	3149	14.22	52.49
No	10523	47.51	100.00
Total	22148	100.00	

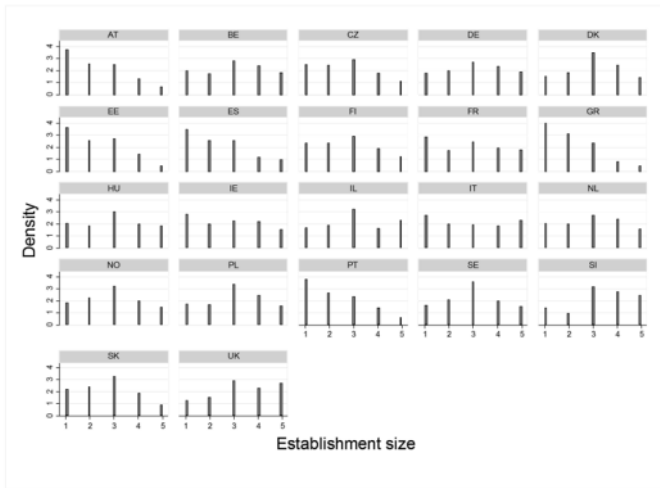


Figure D.4: Distribution of employees in establishment with specific size (1=under 10 employees, 2 = 10 to 25, 3 = 25 to 99, 3 = 100 to 499, 5 = more than 500) (source: ESS, wave 2 and 5).

Table D.4: Establishment size; frequencies refer to number of employees working in establishment of specified size (source: ESS, wave 2 and 5).

Establishment size (number of employees working in-)	Establishment size (number of employees working in-)		
	Freq.	Percent	Cum.
Under 10	4685	21.15	21.15
10 to 25	4336	19.58	40.73
25 to 99	5949	26.86	67.59
100 to 499	4123	18.62	86.21
500 or more	3055	13.79	100.00
Total	22148	100.00	

Appendix E: Robustness of results in Chapter 4

The results from Models 1e-1g support the proposed relation between the relative deregulation of temporary employment and the skill specificity mechanism. However, these results may be driven by the specifics of the sample of countries. To address these concerns, Figure E.1 plots the country-specific coefficients of skill specificity obtained from (22) country-level logit models, against the drivers of the results in Figure 4.1: the country-specific level of EPLp and the country-specific level of the relative deregulation EPLt.

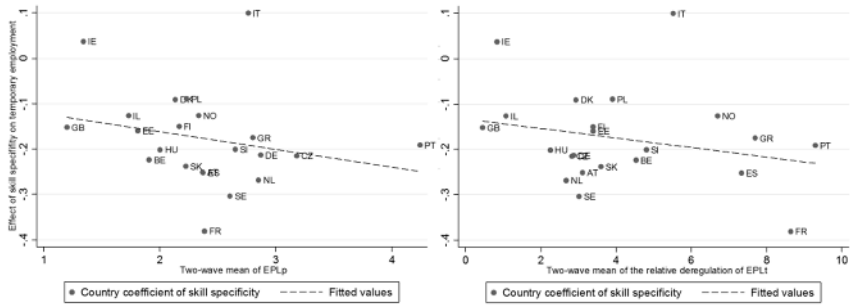


Figure E.1: Scatterplots of the country-level effect of skill specificity on the probability of temporary employment, and country-level EPLp (pane 1) or EPLp * EPLt (pane 2) (source: ESS, wave 2 and 5).

To illustrate, these figures show that in Italy the relation between skill specificity and the risk of temporary employment is positive (which is consistent with Barbieri and Scherer’s [2009] findings), whereas in France it is strongly negative. These coefficients of skill- specificity are negatively related to the level of EPLp and EPLp * EPLt, as indicated by the slopes of the linear fits in both figures, which is consistent with Table 4.2 and Figure 4.1. However, given the strong spread in both figures, and the fact that Figure E.1 does not account for the main effects of EPLp and EPLt, Models 1e and 1g are both estimated 22 times, each time with a different country left out of the sample. These results are shown in Table E.1.

Table E.1: Results for the coefficients of specificity*EPLp and specificity*EPLp*EPLt for different country samples (source: ESS, wave 2 and 5).

Country removed from sample	b(specificity*EPLp) (Model 1e)	p-value	b(specificity*EPLp*EPLt) (Model 1g)	p-value
AT	-0.10	0.01	0.06	0.03
BE	-0.10	0.01	0.06	0.03
CZ	-0.11	0.01	0.08	0.00
DE	-0.10	0.02	0.06	0.05
DK	-0.09	0.02	0.06	0.03
EE	-0.10	0.01	0.06	0.03
ES	-0.09	0.01	0.06	0.03
FI	-0.10	0.01	0.06	0.03
FR	-0.09	0.01	0.06	0.03
GR	-0.10	0.01	0.05	0.05
HU	-0.10	0.01	0.06	0.03
IE	-0.06	0.02	0.04	0.08
IL	-0.09	0.02	0.06	0.03
IT	-0.10	0.01	0.06	0.03
NL	-0.09	0.02	0.05	0.05
NO	-0.09	0.01	0.06	0.03
PL	-0.10	0.01	0.06	0.03
PT	-0.13	0.01	0.06	0.16
SE	-0.09	0.01	0.05	0.04
SI	-0.09	0.01	0.06	0.03
SK	-0.10	0.01	0.06	0.03
GB	-0.09	0.06	0.08	0.03

Table E.1 shows that the relation between the level of EPLp and the skill specificity mechanism is robust against variation in the sample of countries, as indicated by the generally low p-values. Only removing Great Britain has a strong effect on the p-value of the specificity coefficient. However, at 0.06 it is still fairly low and the coefficient itself is largely unaffected. The relation between the relative deregulation of EPLt and the specificity mechanism however, seems driven by the presence of Portugal in the sample: removing this country increases the p-value to 0.16, which indicates non-significance under any conventional rule. The coefficient is not affected however. The presence of the Czech Republic on the

other hand, suppresses the relation between skill specificity and the relative deregulation of EPLt: removing the Czech Republic from the sample decreases the p-value to below 0.005. Estimating the Model 7 without both Portugal and the Czech Republic again yields a significant relation between EPLp and the relative deregulation of EPLt. The strong robustness of the coefficients and the relative robustness of the p-values against changes in the sample indicate that the influence of EPL characteristics is not driven solely by the presence of outliers in the sample. A similar analysis holds for education, although here the influence of Portugal on the results of the three-way interaction is even more pronounced. See Table E.2.

Table E.2: Results for the coefficients of edu*EPLp and edu*EPLp*EPLt for different country samples (source: ESS, wave 2 and 5).

Country removed from sample	b(education*EPLp) (Model 2c)	p-value	b(education*EPLp*EPLt) (Model 2c)	p-value
AT	-0.21	0.00	0.09	0.00
BE	-0.22	0.00	0.10	0.00
CZ	-0.24	0.00	0.10	0.00
DE	-0.20	0.00	0.08	0.00
DK	-0.21	0.00	0.09	0.00
EE	-0.21	0.00	0.08	0.00
ES	-0.23	0.00	0.09	0.00
FI	-0.21	0.00	0.09	0.00
FR	-0.21	0.00	0.09	0.00
GR	-0.21	0.00	0.09	0.00
HU	-0.21	0.00	0.09	0.00
IE	-0.21	0.00	0.08	0.00
IL	-0.21	0.00	0.09	0.00
IT	-0.21	0.00	0.09	0.00
NL	-0.21	0.00	0.09	0.00
NO	-0.21	0.00	0.09	0.00
PL	-0.21	0.00	0.08	0.00
PT	-0.22	0.00	0.07	0.29
SE	-0.20	0.00	0.08	0.00
SI	-0.21	0.00	0.09	0.00
SK	-0.21	0.00	0.09	0.00
UK	-0.15	0.03	0.06	0.08

Appendix F: Descriptive statistics for Chapter 5

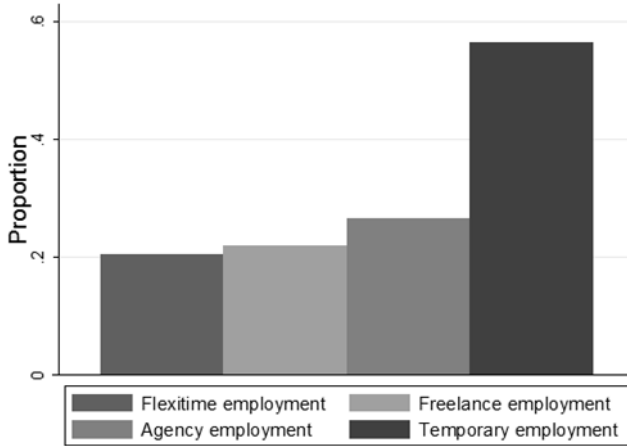


Figure F.1: Employers' use of different types of numerical flexibility in the Netherlands. "Use" is defined as having at least one employee working under the specified arrangement (source: European Company Survey, 2009).

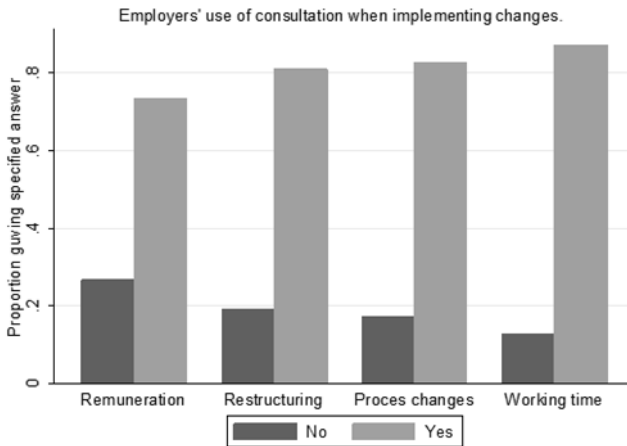


Figure F.2: Do employers consult employees when implementing changes with regard to 1) remuneration, 2) restructuring, 3) work processes, and 4) working time arrangements (source: European Company Survey, 2009)?

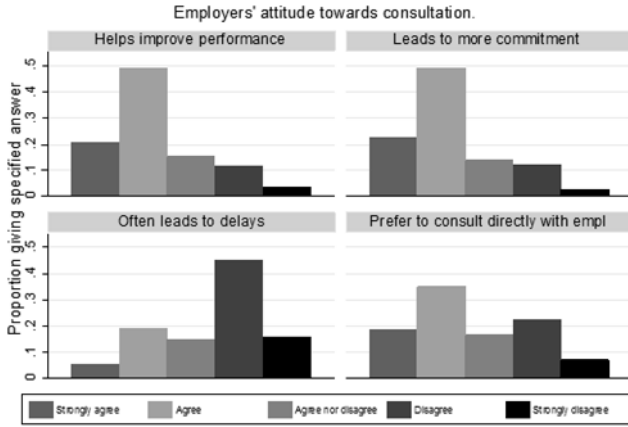


Figure F.3: Employers' attitude towards consultation as indicated by their agreement with a series of statements (source: European Company Survey, 2009).

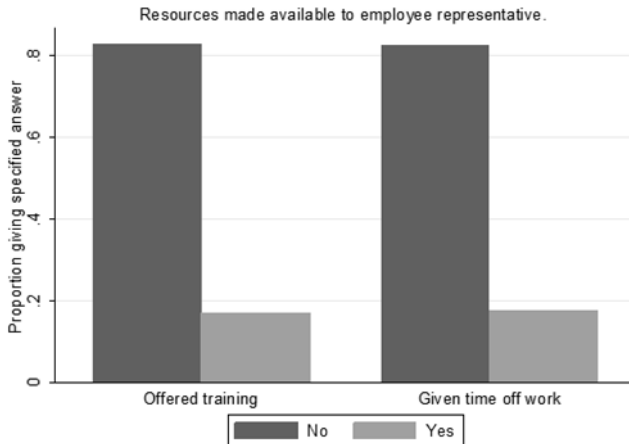


Figure F.4: Resources made available by employers to employee representative, as indicated by the representative being offered training and being allowed to take time off work (source: European Company Survey, 2009).

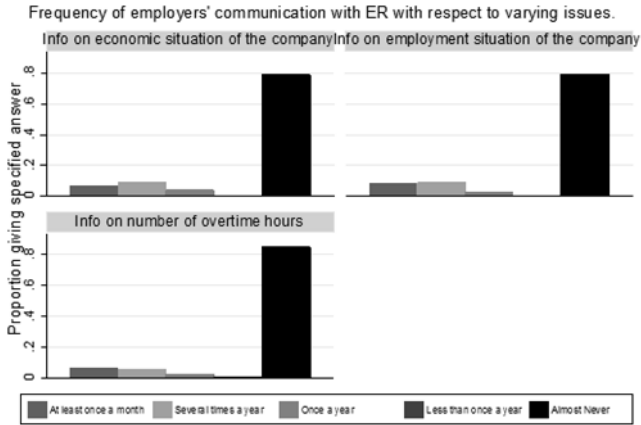


Figure F.5: Frequency of employers' communication with employee representative on 1) the economic situation of the company, 2) the employment situation of the company, and 3) the number of overtime hours (source: European Company Survey, 2009).

Usefulness and quality of information distributed by employers

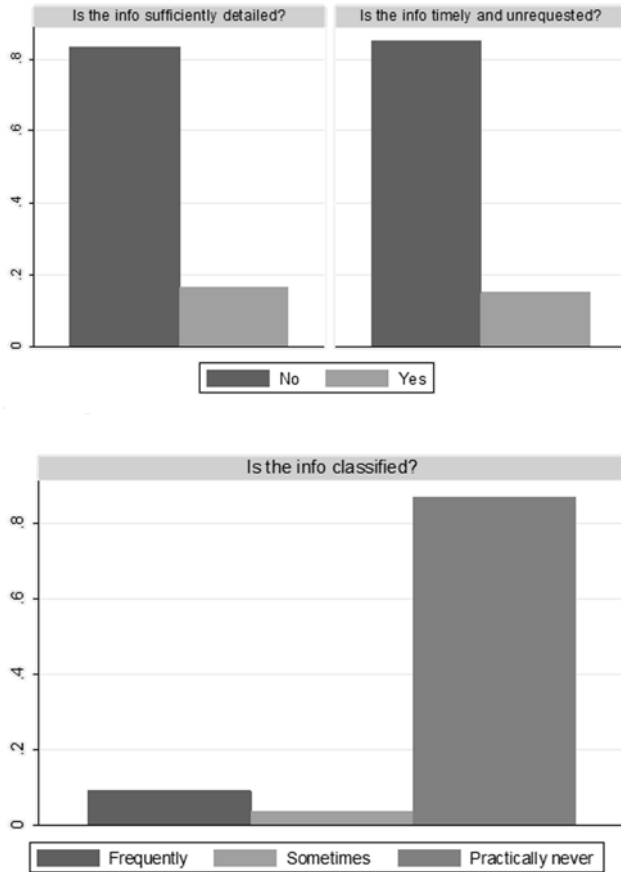


Figure F.6: Usefulness and quality of information distributed by the employer, as indicated by the employee representative. Is the information 1) sufficiently detailed, 2) timely and unrequested, and 3) classified and thus not distributable to employees (source: European Company Survey, 2009)?

Appendix G: Descriptive statistics for Chapter 6

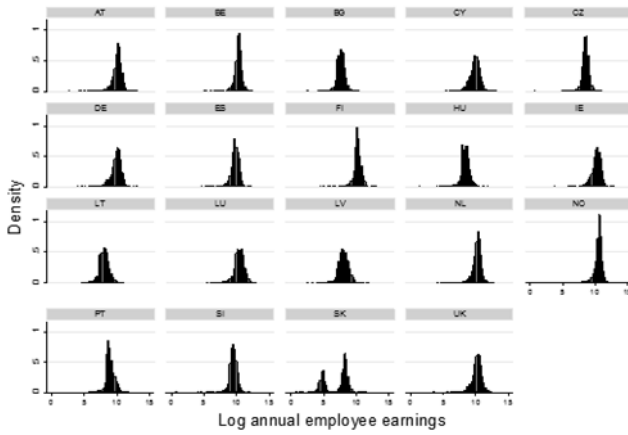


Figure G.1: Employee log yearly earnings distributions per country (Source: EU-SILC).

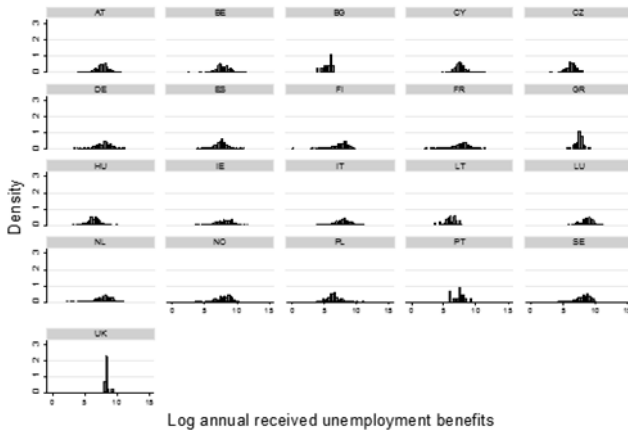


Figure G.2: Distribution of log annual unemployment benefits received for individuals who were unemployed for a period in that year, per country (source: EU-SILC).

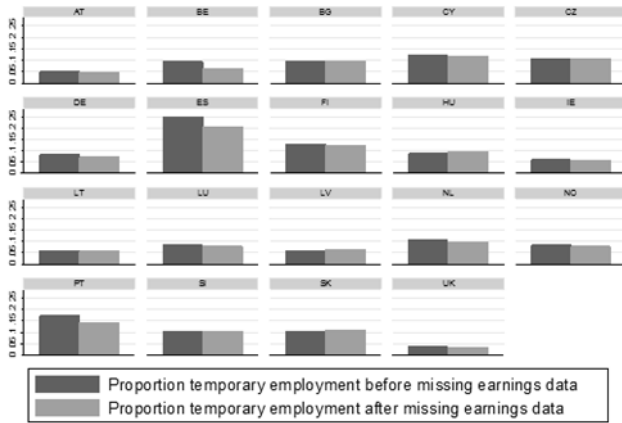


Figure G.3: Effect of correcting for missing earnings data on the proportion of temporary employment (as compared to permanent employment) country (source: EU-SILC).

Table G.1: Minimum wage amount (source: Eurostat, 2014) per country year.

Country		2004	2005	2006	2007	2008	2009
AT	Minimum wage amount	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
BE	Minimum wage amount	€ 1,186.31	€ 1,210.00	€ 1,234.00	€ 1,259.00	€ 1,309.60	€ 1,387.50
BG	Minimum wage amount	€ 61.36	€ 76.69	€ 81.79	€ 92.03	€ 112.49	€ 122.71
CY	Minimum wage amount	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
CZ	Minimum wage amount	€ 206.73	€ 235.85	€ 261.03	€ 291.07	€ 300.44	€ 297.67
DE	Minimum wage amount	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
ES	Minimum wage amount	€ 537.25	€ 598.50	€ 631.05	€ 665.70	€ 700.00	€ 728.00
FI	Minimum wage amount	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
HU	Minimum wage amount	€ 201.90	€ 231.74	€ 247.16	€ 260.16	€ 271.94	€ 268.09
IE	Minimum wage amount	€ 1,073.15	€ 1,183.00	€ 1,292.85	€ 1,402.70	€ 1,461.85	€ 1,461.85
LT	Minimum wage amount	€ 130.34	€ 144.81	€ 159.29	€ 173.77	€ 231.70	€ 231.70
LU	Minimum wage amount	€ 1,402.96	€ 1,466.77	€ 1,503.42	€ 1,570.28	€ 1,570.28	€ 1,641.74
LV	Minimum wage amount	€ 540.84	€ 555.06	€ 584.24	€ 601.90	€ 617.21	€ 634.88
NL	Minimum wage amount	€ 1,264.80	€ 1,264.80	€ 1,272.60	€ 1,300.80	€ 1,335.00	€ 1,381.20
NO	Minimum wage amount	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
PT	Minimum wage amount	€ 425.95	€ 437.15	€ 449.98	€ 470.17	€ 497.00	€ 525.00
SI	Minimum wage amount	€ 470.99	€ 490.07	€ 511.90	€ 521.80	€ 538.53	€ 589.19
UK	Minimum wage amount	€ 1,054.20	€ 1,134.67	€ 1,212.61	€ 1,314.97	€ 1,242.24	€ 995.28

Table G.2: Coordination in wage setting per country-year (source: Visser, ICTWSS database, 2013).

country	2004	2005	2006	2007	2008	2009
AT	3	3	3	3	3	3
BE	4	4	4	4	4	4
BG	1	1	3	1	1	1
CY	1	1	1	1	1	1
CZ	1	1	1	1	1	1
DE	3	3	3	3	3	3
ES	3	3	3	3	3	2
FI	4	4	4	2	2	2
HU	1	1	1	1	1	1
IE	3	3	3	3	3	2
LT	0	0	0	0	0	0
LU	1	1	3	1	1	1
LV	1	1	1	1	1	1
NL	3	3	2	2	2	3
NO	3	3	3	3	3	3
PT	1	1	1	1	1	2
SI	3	3	3	3	3	3
UK	0	0	0	0	0	0

Table G.3: Extension of collective agreements per country-year (source: Visser, ICTWSS database, 2013).

country	2004	2005	2006	2007	2008	2009
AT	3	3	3	3	3	3
BE	3	3	3	3	3	3
BG	1	1	1	1	1	1
CY	0	0	0	0	0	0
CZ	0	0	0	1	1	1
DE	1	1	1	1	1	1
ES	3	3	3	3	3	3
FI	2	2	2	2	2	2
HU	1	1	1	1	1	1
IE	1	1	1	1	1	1
LT	1	1	1	1	1	1
LU	3	3	3	3	3	3
LV	0	0	0	0	0	0
NL	2	2	2	2	2	2
NO	1	1	1	1	1	1
PT	3	3	3	3	3	3
SI	3	3	3	3	3	3
UK	0	0	0	0	0	0

Table G.4: Conditionality of unemployment benefit entitlement duration on contribution history, per country (source: MISSOC database).

Duration of entitlements conditional on contribution period?	
Yes	No
Austria	Belgium
Bulgaria	Cyprus
Germany	Czech Republic
Spain	Finland
France	Italy
Greece	Sweden
Hungary	United Kingdom
Ireland	
Lithuania	
Luxembourg	
Netherlands	
Norway	
Poland	
Portugal	

Nederlandse samenvatting

Flexibele arbeid, precare werknemers?

Verklaringen voor numerieke flexibiliteit op het niveau van de baan, de werkgever en instituties, en de relatie met precare arbeid.

Inleiding

In de laatste decennia heeft er op arbeidsmarkten een substantiële groei in het aandeel flexibele arbeid plaatsgevonden (Kalleberg, 2011; Rodgers & Rodgers, 1989), wat tijdelijke arbeid omvat, werk via een uitzendbureau, ZZP-schap, en arbeid met flexibele uren.

Onderzoekers uit een variëteit aan disciplines hebben de oorzaken en gevolgen van deze ontwikkeling bestudeerd. Sociologen en economen hebben de relatie tussen globalisering en marktvolatiliteit aan de ene kant en flexibele arbeid aan de andere kant onderzocht (Abraham, 1988; De Graaf-Zijl, 2005; Foote & Folta, 2002; Houseman, 2001; Kalleberg, 2011; Powell, 2001). Daarnaast hebben zij de karakteristieken bestudeerd van het werk dat door flexibele krachten wordt uitgevoerd (Breen, 1997; Goldthorpe, 2000; Kalleberg, Reynolds, & Marsden, 2003; Polavieja, 2003). Sociologen en economen richten zich ook op de institutionele verschillen tussen landen die een verklaring zouden kunnen geven voor verschillen in het aandeel flexibele arbeid (Barbieri, 2009; DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006; Gebel & Giesecke, 2011; Muffels & Luijkx, 2008; Polavieja, 2003) en voor de loonverschillen tussen vaste en flexibele krachten (Booth, Francesconi, & Frank, 2002; Davia & Hernanz, 2004; De Graaf-Zijl, 2012; Mertens, Gash, & McGinnity, 2007). Sociologen en antropologen bestuderen ook de demografische en persoonlijke factoren die gerelateerd zijn aan flexibele arbeid, zoals geslacht, leeftijd en immigratie status (Ahmad, 2008; Barbieri, 2009; Cranford, Vosko, & Zuckewich, 2003). Sociologen en politicologen onderzoeken de relatie tussen flexibele arbeid en stemgedrag (Rueda, 2005), en voorkeuren met betrekking tot de verzorgingsstaat (Burgoon & Dekker, 2010; Paskov & Koster, 2014), terwijl psychologen en gezondheidswetenschappers de gevolgen van flexibele arbeid voor de geestelijke gezondheid (Benach & Muntaner, 2007; Fouad & Bynner, 2008; Friel & Baker, 2009) en ongelukken op het werk onderzoeken (Benach & Muntaner, 2007; Lewchuck, Wolff, King, & Polanyi, 2003).

Dit proefschrift gaat over numerieke flexibiliteit en precare arbeid. Numerieke flexibiliteit betreft vormen van arbeidscontracten waarin het de werkgever toegestaan is 1) de arbeidsuren van werknemers op korte termijn uit te breiden en in te korten, en 2) het dienstverband van de werknemer op korte

termijn en tegen relatief lage kosten te beëindigen. Het concept “precaire arbeid” wordt in het proefschrift verder uitgewerkt en refereert kort gezegd aan situaties waarin een werknemer met een numeriek flexibele arbeidsrelatie tegelijkertijd financiële onzekerheid ervaart, i.e. hij/zij is onzeker of er bij ontslag voor de te overbruggen periode tot de volgende baan een acceptabele levensstandaard gehandhaafd kan worden (Rodgers & Rodgers, 1989). De hoofdvraag van deze dissertatie betreft precare arbeid:

MQ: Hoe kan precare arbeid verklaard worden, vanuit eigenschappen van de baan, de werkgever en de institutionele omgeving?

De beantwoording van deze vraag behoeft de beantwoording van een aantal sub vragen. Hoe kunnen de beslissingen van werkgevers om numeriek flexibele contracten aan te bieden verklaard worden, als gekeken wordt naar de eigenschappen van de betreffende baan? En hoe verhouden instituties tot deze beslissing? Wat is de relatie tussen de houding van werkgevers ten opzichte van *Human Resource Management* (HRM) en hun gebruik van numerieke flexibiliteit? En hoe is numerieke flexibiliteit gerelateerd aan precare arbeid?

Baankenmerken en numerieke flexibiliteit

In de eerste plaats wordt in dit proefschrift de relatie tussen kenmerken van de baan en de kans dat de uitvoerende werknemer een numeriek flexibel contract heeft bestudeerd. Daarbij wordt de mediërende invloed van de institutionele omgeving bekeken, specifiek met betrekking tot ontslagbescherming.

Dit proefschrift past inzichten van transactiekosten theorie toe om een beeld te krijgen van de relatie tussen kenmerken van de baan en numerieke flexibiliteit. Transactiekosten theorie stelt dat de kenmerken van een baan gevolgen hebben voor de mate waarin een werkgever in staat is om de prestaties van een werknemer te monitoren, en voor de mate waarin de werknemer vaardigheden opdoet die enkel binnen dat specifieke bedrijf opgedaan worden en inzetbaar zijn (specifieke vaardigheden) (Goldthorpe, 2000; Williamson, 1981). Het monitoren van een werknemer is wenselijk voor de werkgever, omdat er altijd een verschil kan zijn in de belangen van de werknemer en de werkgever, wat ertoe kan leiden dat de werknemer in zijn/haar eigen belang handelt en niet optimaal productief is (Goldthorpe, 2000; Shapiro, 2005). Hoe complexer de taken die bij een baan komen kijken, hoe moeilijker direct monitoren wordt. De werkgevers zal vaak niet weten hoe het werk uitgevoerd moet worden., laat staan wat bij dergelijk werk precies “optimale productiviteit” is. Werknemers in complexe banen hebben dientengevolge een significante mate van autonomie in de uitvoer van hun werk, zonder dat de werkgever door middel van prikkels goed kan sturen op een optimaal resultaat. Een mogelijke manier voor de werkgever om dit

dilemma te overkomen, is om werknemers toegewijd te krijgen, bijvoorbeeld door het aanbieden van een vast contract, wat tegelijkertijd als uiting van vertrouwen gezien kan worden en als verbinding van het lot van de organisatie en de werknemer.

Werk dat enkel effectief uitgevoerd kan worden door een werknemer met ervaring met dat specifieke werk, is werk waarvoor veel specifieke vaardigheden benodigd zijn en dat de opbouw van specifieke vaardigheden verzorgt (Goldthorpe, 2000). Dit komt bijvoorbeeld tot uiting in lange inwerkperiodes. Doordat een nieuw aangenomen werknemer dit werk per definitie niet optimaal kan uitvoeren, zijn er voor de werkgever kosten verbonden aan het vervangen van de huidige werknemer (Williamson, 1981). Eenvoudig werk zal doorgaans nauwelijks gepaard gaan met de opbouw van specifieke vaardigheden. Complex werk zal vaker gepaard gaan met de opbouw van specifieke vaardigheden, maar niet eenduidig: veel complex ICT gerelateerd werk zal samengaan met de opbouw van specifieke vaardigheden, maar chirurgie, al is het complex, kan in meerdere ziekenhuizen uitgevoerd worden en is daardoor niet bijzonder specifiek (Williamson, 1981). Gemiddeld genomen zal meer complexiteit echter wel samengaan met meer specifieke vaardigheden, en, gezien tegelijkertijd toenemende vervangingskosten, met een verhoogde kans op een vast contract.

In hoofdstuk 3 van dit proefschrift wordt de relatie tussen de complexiteit van het werk en de kans op een numeriek flexibel contract onderzocht, met behulp van het Arbeidsvoorwaardeonderzoek (AVO). Deze dataset biedt observaties op het niveau van de werknemer en de organisatie waarin hij/zij werkzaam is, voor 2003, 2005 en 2007. Een analyse van deze data met behulp van multi-niveau logit modellen ondersteunt de voorgestelde relaties: complexe banen worden vaker uitgevoerd door werknemers op vaste contracten dan minder complexe banen (Hoofdstuk 3). Verder wijzen de resultaten uit dat werknemers in complexe banen vaak wel op een tijdelijk contract aangenomen worden, maar vaker dan werknemers in minder complexe banen doorstromen naar een vast contract. Tot slot doen de resultaten vermoeden dat deze effecten in seizoengevoelige sectoren sterker zijn: werknemers met relatief eenvoudig werk hebben in die sectoren vaker een numeriek flexibel contract en dragen hiermee een deel van het risico op seizoensgebonden schommelingen in de vraag naar producten en diensten (zie Breen, 1997). De verwachting dat een toename in de complexiteit van het werk gepaard gaat met een toename in de kans op een vast contract lijkt dus gesteund door de resultaten. Specifiek werd echter voorgesteld dat dit effect via de mate van autonomie en specifieke vaardigheden zou lopen. Als gedeeltelijke test van dit mechanisme wordt in hoofdstuk 4 onder andere de relatie tussen autonomie en specifieke vaardigheden aan de ene kant, en het risico op een tijdelijk contract aan de andere kant getest. Dit gebeurt op basis van het European Social Survey (ESS) voor 2005 en 2010 met een steekproef uit 22 Europese landen, wat wederom geanalyseerd wordt met multi-niveau logit modellen. De resultaten ondersteunen de verwachtingen: zowel autonomie als

specifieke vaardigheden zijn negatief gerelateerd aan de kans op een tijdelijk contract. Hoewel niet de kern van hoofdstuk 4, wordt eenzelfde relatie gevonden voor opleidingsniveau.

De invloed van ontslagbescherming

Bovenstaande relaties nemen naar verwachting verschillende vormen aan in verschillende institutionele omgevingen. Polavieja (2003) en Gebel & Giesecke (2011) stellen dat kenmerken van de ontslagbescherming in verschillende landen invloed uitoefenen op de kosten-baten analyse die werkgevers (impliciet) uitvoeren wanneer zij besluiten met welke contractvorm zij een werknemer aan gaan nemen. Wanneer de bescherming van tijdelijke contracten laag is en de bescherming van vaste contracten hoog, zijn vaste contracten relatief duur en zullen deze enkel nog gegeven worden aan werknemers waarvoor deze kosten te verantwoord zijn. Dit betreft onder andere werknemers in banen met veel autonomie en werknemers met veel specifieke vaardigheden: de productiviteitswinsten die werkgevers behalen door deze werknemers een vast contract aan te bieden, zijn dusdanig groot dat deze keuze rendabel is. Voor werknemers in banen met weinig autonomie en specifieke vaardigheden is de keus voor een vast contract juist minder snel rendabel en deze werknemers worden vaak op tijdelijke contracten aangenomen. Hoe groter het verschil tussen de bescherming van vaste en tijdelijke contract, hoe scherper de polarisatie van de arbeidsmarkt (in termen van numerieke flexibiliteit) naar baankenmerken.

De voorgestelde relatie tussen ontslagbescherming en de risico's op numerieke flexibiliteit worden getest in hoofdstuk 4, tegelijk met de alternatieve verklaring dat het niet autonomie en specifieke vaardigheden zijn die de verwachte polarisatie drijven, maar opleidingsniveau (zie Gebel & Giesecke, 2011). Een analyse van het ESS en de OECD indicatoren voor ontslagbescherming met multiniveau modellen laat in eerste instantie zien dat de arbeidsmarkt niet lijkt te polariseren langs de hoeveelheid autonomie die een baan vraagt. Dit geldt wel voor specifieke vaardigheden: in landen met een groter verschil tussen de bescherming van tijdelijke en vaste contracten, is het risico dat werknemers met veel specifieke vaardigheden een tijdelijk contract hebben kleiner ten opzichte van werknemers met weinig specifieke vaardigheden. Deze relatie wordt echter grotendeels weg verklaard wanneer gecontroleerd wordt voor onderwijs, waardoor het vermoede ontstaat dat het onderwijsniveau dit effect drijft, en niet de mate van specifieke vaardigheden die uit de kenmerken van de baan voortvloeit. Hier is verder onderzoek nodig.

De houding van werkgevers met betrekking tot *human resource management (HRM)* en hun gebruik van numerieke flexibiliteit

Naast de door baankenmerken geïnformeerde (transactie-) kosten-baten analyses die werkgevers naar verwachting doen wanneer zij besluiten of zij een werknemer op een vast of numeriek flexibel contract aannemen, zijn alternatieve verklaringen voor de uitkomst van deze beslissing goed mogelijk. Op basis van organisatie theorieën met betrekking tot psychologische contracten (Rousseau, 1989) en management ideologie (Geare, Edgar, & McAndrew, 2009) kunnen verwachtingen worden geformuleerd omtrent de relatie tussen de HRM attitudes van werkgevers en hun gebruik van numerieke flexibiliteit. De theorie van psychologische contracten stelt dat werkgevers inzet bij hun werknemers kunnen uitlokken door óf expliciet in de arbeidsrelatie te investeren om aan de werknemer als wederdienst een hoge inzet te ontlokken (denk aan incidentele financiële beloningen), óf door aan te geven een doorlopende band aan te gaan met de werknemer en zo een hoge mate van toewijding aan de werknemer te ontlokken (denk aan een vast contract, of carrièremogelijkheden) (Rousseau, 1989). Aangezien beide aanpakken in theorie hetzelfde resultaat kunnen opleveren, kan de keuze tussen beiden deels ingegeven worden door de voorkeur van de werkgever. Deze voorkeur kan op zijn beurt voortvloeien uit wat de werkgever een intrinsiek “betere” aanpak vindt. Werkgevers die de relatie tussen management en personeel in essentie als coöperatief inschatten en menen dat beide partijen in beginsel dezelfde doelen en belangen hebben (een unitaristische opvatting) (Geare, Edgar, & McAndrew, 2009), zullen geneigd zijn impliciet te investeren en de nadruk te leggen op toewijding. Werkgevers die daarentegen de relatie tussen management en personeel in essentie als antagonistisch inschatten en menen dat de belangen tussen management en personeel in beginsel tegenstrijdig zijn (een pluralistische opvatting), zullen eerder expliciet investeren en de nadruk leggen op *ad hoc* wederkerigheid. Als onderdeel van hun geprefereerde HRM aanpak zullen werkgevers met een unitaristische inslag sneller geneigd zijn om werknemers een vast contract aan te bieden, terwijl werkgevers met een pluralistische inslag juist geneigd zijn met numeriek flexibele contracten te werken, omdat de losse binding met de organisatie de werknemer ontvankelijker maakt voor expliciete investeringen (Guest, 2004). Een viertal interviews met werkgevers in Nederland biedt voorzichtige ondersteuning voor deze redenering.

Op basis van bovenstaande redenering is in hoofdstuk 5 onderzocht of werkgevers die geneigd zijn hun werknemers te raadplegen bij beslissingen binnen het bedrijf en met hen te communiceren (indicatoren voor unitarisme) minder gebruik maken van numerieke flexibiliteit dan werkgevers die minder raadplegen en communiceren (indicatoren voor pluralisme). De voorgestelde relaties zijn onderzocht met behulp van het European Company Survey voor 2009, op basis van een steekproef in 30 Europese landen (al is er in het hoofdstuk geen

internationale vergelijking gedaan). De resultaten boden enige, zij het beperkte, steun aan de voorgestelde verbanden: het raadplegen van werknemers bij beslissingen betreffende veranderingen binnen de organisatie was gerelateerd aan een verminderd gebruik van numerieke flexibiliteit. Echter, de verklarende kracht (gemeten als de verandering in de R^2) van de voorgestelde verbanden was zeer beperkt, waardoor vraagtekens gezet zouden kunnen worden bij de mate waarin zaken als de ideologie en voorkeuren van managers doorslaggevend zijn voor de contractbeslissingen van werkgevers. Meer onderzoek in deze richting zou zulks moeten uitwijzen.

Precaire arbeid: werkonzekerheid en financiële onzekerheid

In hoofdstuk 2 wordt precaire arbeid gedefinieerd als de situatie waarin werknemers werkzaam zijn op een numeriek flexibel contract, een hoog risico op werkloosheid hebben, een laag inkomen hebben en een beperkte aanspraak hebben op een werkloosheidsuitkering.

Allereerst is de relatie tussen numerieke flexibiliteit en het risico op werkloosheid onderzocht. Hiertoe zijn de eerder beschreven elementen van transactiekosten theorie gekoppeld aan de proposities van de theorie van de duale arbeidsmarkt (Piore & Sabel, 1984), welke een scheiding van de arbeidsmarkt in een stabiele en zekere kern en een dynamische en onzekere periferie beschrijft. Wanneer gesteld wordt dat werkgevers werknemers met hoge transactiekosten (met complex werk, veel autonoom, en veel specifieke vaardigheden) aannemen op een vast contract, terwijl zij werknemers met lage transactiekosten aannemen op een numeriek flexibel contract, is de gevolgtrekking van duale arbeidsmarkt theorie dat de arbeidsmarkt zich langs de lijnen van transactiekosten scheidt in een kern en een periferie. Aangezien de ontslagbescherming van vaste contracten doorgaans hoger is dan die van flexibele contracten, versterkt de institutionele omgeving deze scheiding. Hoe groter het verschil tussen de ontslagbescherming van tijdelijke contracten en vaste contracten, hoe minder doorstroom van de periferie naar de kern, en hoe groter het risico dat werknemers op een numeriek flexibel contract in de toekomst werkloos worden. Dit is ook wel de “val” van flexibele arbeid genoemd (Booth, Francesconi, & Frank, 2002). In hoofdstuk 4 is onderzocht of tijdelijk werk in het heden inderdaad het risico op tijdelijk werk en werkloosheid in de toekomst vergroot, en of deze relatie afhankelijk is van het verschil in de bescherming van tijdelijke en vaste contracten. Om dit verband te testen is gebruik gemaakt van het European Study of Income and Living Conditions (EU-SILC): een longitudinale dataset met gegevens over het werk en inkomen van respondenten in (na bewerking) 20 landen, over maximaal vier jaar. De data is geanalyseerd met multiniveau logit-modellen, waarbij rekening is gehouden met longitudinale karakter van de data. Zoals verwacht laten de resultaten zien dat het hebben van

een tijdelijk contract gemiddeld genomen het risico op een tijdelijk contract of werkloosheid een jaar later vergroot. In tegenstelling tot de verwachting is dit verband echter onafhankelijk van het verschil tussen de bescherming van tijdelijke en vaste contracten.

Naast een hoger risico op werkloosheid is de verwachting dat werknemers op tijdelijke contracten minder verdienen dan werknemers op vaste contracten. Aangezien het bij preciaire arbeid gaat om het risico op het niet kunnen bekostigen van een (matschappelijk) minimaal acceptabele levensstandaard, wordt hierbij in eerste instantie gekeken naar de ruwe jaar- en maandlonen. Vervolgens wordt gekeken naar beloningsverschillen in de vorm van uurlonen voor vergelijkbare werknemers. De verwachting is dat werknemers met een tijdelijk contract vanwege hun lagere opleidingsniveau, lagere mate van autonomie en specifieke vaardigheden, maar door ook hun lagere leeftijd en lagere aantal werkuren gemiddeld genomen minder verdienen dan werknemers met een vast contract. In hoofdstuk 6 wordt, wederom met behulp van EU-SILC, aangetoond dat de tijdelijke werknemers inderdaad minder verdienen dan vaste werknemers. Per land bekeken zijn de verschillen groot, al kan voor alle landen gesteld worden dat tijdelijke werknemers een groter risico hebben om minder dan 60% van het mediaan loon te verdienen dan vaste werknemers, hetgeen in hoofdstuk 2 als deelindicator voor preciaire arbeid voorgesteld werd.

De beloningsverschillen bieden een indicatie voor de mate waarin werkgevers bijdragen aan verschillen in loon tussen vaste en tijdelijke werknemers: als alle verschillen tussen werknemers weggenomen worden, kan ervan uitgegaan worden dat overgebleven verschillen in loon een gevolg zijn van het feit dat werkgevers vaste werknemers anders belonen dan tijdelijke werknemers. Waar de verwachting rond de ruwe verschillen in loon eenduidig zijn, zijn de verwachtingen hier meer ambigu. Economische theorieën die uitgaan van hedonische prijzen zouden voorspellen dat tijdelijke werknemers gecompenseerd worden voor het risico dat zij dragen, waardoor zij meer verdienen dan vaste werknemers (Rosen, 1974). Theorieën die uitgaan van de machtsverschillen die voortvloeien uit het al dan niet vast in dienst zijn van een organisatie, zouden het tegenovergestelde voorspellen: relatief machtige vaste werknemers (insiders) zullen hun eigen loon opdrijven ten koste van de lonen van onmachtige tijdelijke werknemers (outsiders) (Lindbeck & Snower, 1988). Hierbij moet opgemerkt worden dat de empirie doorgaans in het voordeel van de machtstheoretici uitvalt. Dit is ook in hoofdstuk 6 het geval. Op basis van een fixed-effect model en een difference-in-difference analyse blijkt dat het uurloon van tijdelijke werknemers inderdaad lager ligt dan dat van vergelijkbare vaste werknemers, al is geen van beide modellen op zichzelf volledig in staat om dit effect te isoleren.

Omdat het niveau van het minimumloon en de structuur van colectieve loononderhandelingen ingrijpt in de verdeling van de ruwe lonen, is de

verwachting dat zij ook de loonverschillen tussen tijdelijke en vaste werknemers beïnvloeden. Van het minimumloon wordt wel gesteld dat het een positief effect heeft op uurlonen, maar een negatief effect op de jaar- en maandlonen, doordat het de vraag naar arbeid inperkt (Neumark, Schweitzer, & Wascher, 2004). Dit laatste is relevant voor preciaire arbeid en treft naar verwachting vooral tijdelijke werknemers, omdat een afgenomen vraag naar arbeid het meest eenvoudig op deze werknemers af te wentelen is. Inderdaad blijkt in hoofdstuk 6 op basis van een analyse van EU-SILC dat het hebben van een wettelijk minimumloon het verschil in jaarloon tussen vaste en tijdelijke werknemers met de 25% laagste lonen verkleint. Echter, een hoger minimumloon vergroot dit verschil, wat doet vermoeden dat een te hoog minimumloon inderdaad een negatief effect heeft op het aantal gewerkte uren en dagen. Voor het uurloon waren deze verbanden afwezig.

Meer gecoördineerde loononderhandelingen standaardiseren naar verwachting de lonen op de arbeidsmarkt in toenemende mate (Kahn, 2000). Dit verkleint naar verwachting de loonverschillen tussen vaste en tijdelijke werknemers. Aan de andere kant wordt wel gesteld dat tijdelijke werknemers weinig baat hebben bij loononderhandelingen, omdat zij een groot risico lopen om niet onder collectieve overeenkomsten te vallen (Goslinga & Sverke, 2003). Wanneer de resultaten van collectieve onderhandelingen automatisch uitgerold worden over andere delen van de arbeidsmarkt, of de arbeidsmarkt als geheel (extensie), zou ook dit de loonverschillen tussen tijdelijke en vaste werknemers naar verwachting verkleinen. Uit de resultaten in hoofdstuk 6 bleek geen effect van de mate waarin onderhandelingen gecoördineerd zijn, maar wel van de mate van extensie, al was dit slechts voor de 25% laagste verdieneners.

Tot slot gaat preciaire arbeid gepaard met een beperkte aanspraak op een werkloosheidsuitkering. De regelgeving met betrekking tot werkloosheidsuitkeringen op landelijk niveau is grofweg in twee categorieën in te delen. In universele systemen is de hoogte en duur van de uitkering niet gerelateerd aan de arbeidsgeschiedenis, terwijl dit bij verzekeringssystemen juist wel zo is. Aangezien tijdelijke werknemers minder verdienen en een meer gefragmenteerde arbeidsgeschiedenis hebben, is de verwachting dat verzekeringssystemen tijdelijke werknemers benadelen in vergelijking met vaste werknemers, zowel met betrekking tot de hoogte als de duur van de uitkering (Leschke, 2006). De resultaten in hoofdstuk 6 wijzen inderdaad uit dat voormalig tijdelijke werknemers een lagere werkloosheidsuitkering genieten dan voormalig vaste werknemers. Wanneer gekeken wordt naar respondenten die langer dan 3 maanden werkloos zijn, maken de resultaten aannemelijk dat verzekeringssystemen inderdaad een negatieve invloed hebben op de duur van de werkloosheidsuitkering van voorheen tijdelijke werknemers.

Implicaties

Wat zijn nu de implicaties van de hierboven opgesomde bevindingen? Ten eerste blijken transactiekosten en het opleidingsniveau van de werknemer alle elementen van precare arbeid in dezelfde richting te beïnvloeden. Werknemers in banen met weinig autonomie, met weinig specifieke vaardigheden en een laag opleidingsniveau hebben een relatief hoog risico op een numeriek flexibel contract, een laag loon, een lange werkloosheidsduur en een lage en kortdurende werkloosheidsuitkering. Aangezien autonomie in de baan en de opbouw van specifieke vaardigheden grotendeels buiten de invloed van beleidsmakers liggen, is dit het slechte nieuws.

Het goede nieuws is dat een verschillende instituties in lijken te grijpen op verschillende van deze relaties. De relatie tussen opleidingsniveau en wellicht specifieke vaardigheden aan de ene kant, en het risico op numerieke flexibiliteit aan de andere kant, kan wellicht zwakker gemaakt worden door het verschil in de bescherming van vaste en tijdelijke contracten te beperken. Zulks adviseert ook de OECD (2014). Dit zou waarschijnlijk ook de ruwe loonverschillen tussen tijdelijke en vaste werknemers verkleinen en indirect de verschillen in de hoogte van de werkloosheidsuitkering. Daarnaast zou een goed vormgegeven minimumloon de loonverschillen tussen vaste en tijdelijke werknemers kunnen beperken. Hierbij moet vooral de hoogte van het minimumloon zorgvuldig ingesteld worden, om zo niet de vraag naar arbeid teveel te hinderen. Een vergelijkbare rol kan weggelegd zijn voor de extensie van de resultaten van collectieve onderhandelingen. Tot slot kan gekeken worden naar het verzekeringskarakter van werkloosheidsuitkeringen, wat tijdelijke werknemers benadeelt. Zeker omdat het werkloos worden van tijdelijke werknemers essentieel is voor de flexibiliteit van de arbeidsmarkt als geheel, lijkt het wrang om deze groep op dit punt te benadelen.

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