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## Measuring the effect of institutional change on gender inequality in the labour market

Research in Social Stratification and Mobility

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# Measuring the Effect of Institutional Change on Gender Inequality in the Labour Market

## Abstract

This article examines the differential impact of labour market institutions on women and men. It carries out longitudinal analyses using repeat cross-sectional data from the EU Labour Force Survey 1992-2007 as well as time series data that measure institutional change over the same period. The results contribute to the literature on gendered employment, adding important insights into the impact of labour market institutions over and above family policies that have been the focus of most prior studies on the topic. We find differential effects of institutional change on male and female outcome. Our findings challenge the neo-classical literature on the topic. While our results suggest that men benefit more clearly than women from increases in employment protection, we do not find support for the neo-classical assertion that strong trade unions decrease female employment. Instead, increasing union strength is shown to have beneficial effects for both men's and women's likelihood of being employed on the standard employment contract. Furthermore, in line with other researchers, we find that rising levels of *in kind* state support to families improve women's employment opportunities.

**Keywords:** collective bargaining coverage, employment protection, European Labour Force Survey, gender inequality, institutional change, labour market stratification

## Introduction

A 'Unified Theory' originating from US American labour economists (Blau and Kahn, 2002) claims that the American labour market's low unemployment rates are a function of its deregulated institutions which allow high earnings inequality and considerable employment growth. This research examines the employment-population ratio, i.e. the share of adults of working age in employment, and compares the employment rates of the US economy to those of Europe. The neo-classical literature on the topic argues that European economies stifle employment growth with their rigid institutional frameworks. Moreover, this work contends that Europe will never be able to solve its unemployment crisis without a concerted effort to deregulate its employment law and its unions, with these institutions characterised as market interventions that stand in the path of market equilibrium and lower unemployment. A specific variant of the argument focuses on the *heterogeneous institutional effects* of macro-economic structures on labour market outcome. It looks beyond the implications of protective and regulating institutions for overall labour market performance, and focuses on variation in labour market outcomes for different socio-demographic groups. Regulation, so the argument goes, acts to the advantage of male prime-age workers, who are described as labour market insiders. Labour market outsiders (consisting of women, the low skilled, labour market entrants and older workers, immigrants and the unemployed) are presented as disadvantaged in rigid labour markets (see e.g. Bertola et al., 2007; Kahn, 2007). Moreover, deregulation is presented as a way of opening up the labour market, offering outsiders more opportunities for employment and hence reducing demographic inequalities in employment rates (e.g. *ibid.*). The vast majority of existing empirical work concerned with heterogeneous institutional effects has examined differentials in outcome by skill level (e.g. Daniel and Siebert, 2005; Gebel and Giesecke, 2011; Maurin and Postel-Vinay, 2005; Oesch, 2010). Other inequality dimensions have received much less attention to date. This study's theoretical and empirical focus is on the relationship between gender inequality in labour market outcomes and labour market regulation. It contributes to the debate with an empirical test of the effect of 'protective institutions' on gendered

labour market outcome, by examining the heterogeneous effects of changes in national policies and institutional set-ups overtime.

Our dependent variable examines the full-range of labour market statuses (covering employment, unemployment and inactivity) and also examines variations in forms of employment by contract type and working-time. Such an approach allows us to holistically identify which labour market categories and which *forms of employment* are likely to increase or decrease as a result of institutional change. This is an important extension of previous work (e.g. Bertola et al., 2007) as it allows us to (1) comprehensively determine where employment gains are coming from, be it from unemployment or inactivity (a category disproportionately populated by women), and to (2) identify the *calibre of employment* change, i.e. do we observe increases in full-time permanent employment, a positive outcome, as opposed to gains in marginal employment, a less positive outcome. As our study looks at gender differences in outcome it also considers the impact of family policies, which are known to affect female labour supply (e.g. Mandel and Semyonov, 2006; Steiber and Haas, 2012). Our paper therefore seeks to contribute to existing work concerned with heterogeneous effects of labour market institutions whilst also engaging with and complementing existing literature on the impact of welfare state policy on gendered employment outcomes.

Our study of 18 European countries uses micro-data from the European Labour Force Survey (EULFS) as well as high-quality time-series data measuring institutional change spanning a 16-year period (1992-2007). Our methodological focus is on *institutional change* within a longitudinal framework. Estimating fixed-effects models and focusing on *within-country* institutional variation allows us to tackle endogeneity problems (see e.g. Gebel and Giesecke, 2011 for a similar strategy) and estimate more robust effects than cross-sectional analyses which are limited to *between-country* variation of institutional effects. The paper proceeds as follows: we begin with a review of the theoretical accounts on the topic and provide a discussion of the potential mechanisms behind the structuring effects of institutions on gendered outcome. After describing our data and analytical strategy, we present our results. The final section concludes.

## Background and Aims

Analyses of gender inequalities in market outcome have been a keystone of sociological research for a long time. Earlier work tended to focus on women's right to paid work, and was an early rallying cry (e.g. Orloff, 1993, Cockburn, 1991). Yet despite progressive changes in women's labour market engagement (Scott et al., 2008), decreases in the gender pay gap (Rubery and Grimshaw, 2014) and a massive expansion of women in higher education (e.g. Blossfeld and Jänichen, 1992), notable gender inequalities in labour market participation persist. It is often argued that men's *unequal* engagement in unpaid care work (Lister, 2003) leads to women's 'outsider' labour market status, evidenced in their lower participation rates, their family related career interruptions and their strong involvement in part-time employment. Women's weaker attachment to paid work is held to discourage employers from hiring them into high-status positions which require high levels of on-the-job training. Employers are said to 'statistically discriminate' against women as they perceive them to have lower work commitment and lower productivity levels than comparable men. This discriminatory behaviour is argued to be consequential for the gender gap in employment and pay. While gender differences in employment outcomes are universal phenomena, the extent of gender inequality varies substantially across countries. This has triggered cross-nationally comparative work focusing on macro-level dynamics and examining the role of national welfare policies and cultures on the gender gap in labour market participation and attainment (e.g. Stier et al., 2001; Mandel and Semyonov, 2006; Cooke, 2011; Pettit and Hook, 2012). This cross-nationally comparative work has revealed a 'participation-segregation' (Mandel and Semyonov, 2006) or an 'inclusion-inequality' trade-off (Petit and Hook, 2012) which results from state policy seeking to integrate women into 'female friendly' employment. While such efforts indeed result in significant increases in female labour force participation, they also have the unintended effect of increasing/maintaining gender inequalities in terms of occupational attainment and earnings. Mandel and Semyonov (2006, p.1911)

explain how the provision of 'female friendly' employment conditions offered by the public sector reinforces normative expectations of women as primary carers which serve to maintain all women's economic disadvantage by increasing statistical discrimination and occupational segregation. Recent contributions on the implications of welfare policies on gender inequality have shown that institutional effects are conditioned by socio-economic class. Cooke (2011) examines the intersection of gender and class, revealing how class equality is sometimes achieved at the expense of gender inequality. Countries which have protected working-class workers' rights are also countries where it is difficult for outsiders to access the higher echelons. Similarly, Mandel (2012) presents evidence that welfare state policies have differential effects on women's earnings: while they have the potential to mitigate the gender pay gap for low-skilled women, they can actually increase it for high-skilled women.

While the existing work on gender inequality in the labour market had as its predominant focus the role of welfare state institutions, our core interest lies with labour market institutions and their structuring effect on inequality (though we also examine welfare policies). By focusing on change in labour market institutions we want to complement existing work on the macro-level influences on gender inequalities in labour market outcome, while at the same time empirically scrutinising the theoretical assumption of the neo-classical perspective that protective labour market institutions are detrimental for labour market outsiders (e.g. Bertola et al., 2007). The literature reviewed above underscores the importance of analyses that go beyond an assessment of employment rates to ones that provide a more holistic assessment of labour market outcome. In an effort to engage with the integration-segregation paradox, this paper therefore investigates seven different labour market outcomes, providing a distinction between inactivity and unemployment and differentiating employment by contract type and working-time. We investigate the extent to which women are excluded from the standard employment contract (i.e. full-time permanent employment) and examine how change in labour market institutions either supports their access to standard employment contracts or peripheralises them to alternative, and broadly inferior, labour market statuses.

Our contribution focuses on medium-skilled women and men. The medium-skilled constitute the largest labour force group in most countries analysed and so the results we report are relevant for the majority skill level of workers. By controlling for skill our strategy does – to some extent – address the problem of the potential interaction between labour market institutions and women's socio-economic status (cf. Mandel, 2012). Another strategy would have been to analyse different skill categories. Yet it is a strategy that is incompatible with our analyses which distinguish gendered differences in five forms of employment as well as in unemployment and inactivity (seven outcomes overall). Were we to attempt an investigation of the effect of institutional change on *seven* labour market outcomes for women and men and for *three* different skills groups (the low, medium, and high educated) we would need to assess *forty-two* labour market outcomes: 7 outcomes x 2 (by gender) x 3 (by skill level). Such an analysis would clearly be beyond the scope of one research article. A strategy of comparing labour market outcomes by gender and skill level would be most suitable for a research paper on one or perhaps two outcomes, but not seven. We therefore present results for the modal skill group of the European labour force and refer the reader to pre-existing work on the complexities of the relationship between the labour market institutions examined here and skill-based distributions of labour market risks (Gebel and Giesecke, 2011).

## Theoretical Considerations

### Trade Unions

Neoclassical economic theory assumes that unions are responsible for the marginalisation of market 'outsiders' (e.g. Bertola et al., 2007). At its most basic, trade unions are seen to compress the wage distribution, increasing the wages of labour market outsiders by setting high wage floors (Card et al.,

2003). Trade unions thereby impose restrictions on employers' ability to hire workers below wage minima or outside union agreements, (allegedly) resulting in a decrease in low paid jobs. This dynamic is frequently referred to as a 'crowding out' of labour market outsiders by trade unions because outsiders (e.g. the low-skilled, labour market entrants, older workers, and women) are considered to be less productive and employers deem the collectively bargained wages too high for these labour market groups. The theory argues that unions accept such 'disemployment' effects for women and other labour market outsiders as these are considered to have a more elastic labour supply, that is, "employment loss [for them] is less costly because the value of the alternative uses of time is closer to that of being employed" (Bertola *et al.*, 2007: p. 834).<sup>1</sup>

The neo-classical perspective, which argues that stronger unions are more likely to price women out of the labour market, can be challenged however. In their pursuit of the idealised unsegregated labour market, neo-classical economic models frequently ignore gender segregated employment, which entails that men and women often do not compete for the same positions. Hence, the view that women are crowded out from insiders' jobs assumes an open and unstructured market that does not exist. Taking account of the gender-segregated nature of most labour markets, one could even argue that a wider union coverage will increase the chance that not only traditionally male sectors are covered but also 'female' segments (e.g. the private service sector). This may lead to reduced levels of gender inequality in employment outcome. More generally, while in the past trade unions have been accused of peripheralising female workers' concerns, increasingly working women's needs are being recognised and campaigned on by trade unions (McBride, 2000). Instead of intensifying the divide between so-called insiders and outsiders, regulation imposed by unions could thus act to create more inclusive labour markets in which 'vulnerable' groups become insiders (Rubery, 2011: p. 1106). Hence, trade unions, in their support of women workers, may decrease – rather than increase – gendered market inequalities by also bargaining for women's access to standard employment.

Notwithstanding whether stronger unions are thought to have negative or positive effects on labour market performance and inequality, their impact is expected to vary with the level of coordination. Political economy scholars traditionally emphasise positive union effects on labour market performance (e.g. Hall, 2001)<sup>2</sup> and assume that desirable labour market effects of unions strengthen monotonically with the level of coordination (e.g. Streeck and Schmitter, 1985). Calmfors and Driffill (1988), by contrast, introduced a 'hump-shape' hypothesis. With the general expectation that unions are detrimental for labour market performance, they argue that union strength is less harmful in economies with either highly coordinated (at the national level) or uncoordinated (at the firm level) bargaining, while strong unions will have particularly detrimental effects in economies with medium levels of coordination. Unions' wage bargaining in such contexts is claimed to be less moderate than that of unions in highly coordinated or uncoordinated economies where bargaining outcomes are more likely to account for macroeconomic conditions and wage externalities (Traxler and Kittel, 2000).

In summary, a neo-classical framework offers predictions of high male/female differentials in labour market risks in countries with stronger trade unions (which we measure by looking at collective bargaining coverage (CBC)). If the assumptions of this perspective hold, we would expect

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<sup>1</sup> Note that the Political Economy literature also argues that unions can be detrimental for female employment outcome. Rather than arguing that unions price women out of employment, the Political Economy argument hinges on the role of skill regimes. It is theorised that in national contexts with strong unions both workers and employers have incentives to invest in specific skills. However, such contexts put women who tend to have career interruptions at a greater disadvantage as firm-specific human capital depreciates with career interruptions (Iversen and Rosenbluth, 2010: p. 61-62). This is held to have negative implications for their employment rate, while women in general skill regimes which tend to go hand in hand with weak unionisation experience a lower relative disadvantage (*ibid.*).

<sup>2</sup> Again, while writers from the Political Economy School understand unions to exert positive union effects on (aggregate) employment outcome, they do not necessarily believe this to be the case for women.

that rising levels of CBC make it more likely that women are crowded out of the labour market – in particular out of permanent jobs. Assuming a hump-shaped effect of coordination, these negative implications of increased union strength for women should be most pronounced in national contexts with medium levels of coordination. An alternative perspective – challenging the assumptions of neo-classical economic theory – would predict that both men and women benefit from increases in trade union power. This would be evidenced by increased levels of permanent employment and a reduced prevalence of atypical employment, unemployment or inactivity. Moreover, adopting a political economy perspective concerning the mediating role of coordination, we would hypothesise that the positive employment effects of increasing union strength grows monotonically with level of coordination.

## Employment Protection Legislation and the Regulation of Temporary Work

Employment protection legislation (EPL) is often seen to protect labour market insiders at the expense of outsiders. EPL imposes financial and procedural obligations on employers should they want to terminate employment contracts. In more rigid economies legal regulations as well as labour court decisions can make it both time-consuming and expensive to lay off permanent employees (see for instance Mertens et al., 2007; OECD, 2004: chapter 2). In more flexible (deregulated) economies, weaker EPL allows employers to hire and fire with fewer procedural inconveniences and at lower cost. This liberal system is seen to be less disadvantageous for women than highly regulated systems that make it considerably more difficult to fire insiders on permanent contracts. Hence, according to macroeconomic theory employers have fewer incentives for hiring and consequently there will be fewer job openings in more rigid labour markets. Women are more strongly affected by restricted hiring than men given their tendency for discontinuous careers (Kahn, 2007; OECD, 2004). The negative impact of stricter EPL on hiring incentives may not only affect women who aim to re-enter the labour market after family-related employment interruptions. For reasons of statistical discrimination, rigid employment protection may in fact depress all women's chances of obtaining open-ended employment contracts irrespective of the continuity of their employment careers. Employers in higher EPL contexts are more risk averse in their hiring behaviour than their counterparts in lower EPL labour markets and may avoid offering women a permanent contract due to concerns over their allegedly weak labour market attachment and commitment as it would be hard to dismiss a woman if she indeed turned out to be of low productivity. This would suggest that the risks of statistical discrimination would be greater in contexts with stricter EPL, and that women are more likely to be hired outside of the standard employment contract.

While the neo-classical perspective underscores the problematic nature of employment regulation for women as labour market outsiders, an alternative perspective could emphasise that employed women are likely to benefit from stricter employment protection as it lowers their risk of job loss. Stricter employment protection legislation is likely to contain (more effective) stipulations protecting women during their maternity leave thereby increasing their chances of continuous labour market careers. Moreover, stricter employment protection legislation makes it harder for employers to dismiss female workers after their return from maternity leave. If an employer feels that the leave was associated with a depreciation of the worker's job skills, stricter dismissal protection may make it economically viable to invest in the retraining or upskilling of that worker rather than dismissing her. The neo-classical assumption that protective institutions are detrimental for female employment is based on the idea that women have discontinuous careers. However, the very existence of strict employment protection legislation may lead to more continuous female careers and prevent mothers from becoming labour market outsiders (see also Rubery, 2011: p. 1114). In summary, a deregulation of EPL would be predicted to have positive implications for female employment outcomes from the neo-classical point of view, an alternative perspective emphasising the employment-maintaining effects of EPL would predict negative implications for female employment outcomes.

The implications of rigid employment legislation need to be understood in relation to the comparative rigidity of employment law for fixed-term or temporary contracts. Since the 1980s many European economies have deregulated their employment law, not by deregulating regular employment but by facilitating the generation of temporary work (sometimes also referred to as partial deregulation). This has been seen by many as introducing a *dual labour market* that divides secure permanent employees from a peripheralised temporary workforce (so-called flexibility at the margin, e.g. Esping-Andersen and Regini, 2000). In countries with strict EPL for permanent workers there exists a strong incentive for employers to hire workers on fixed-term instead of open-ended contracts (e.g. Pierre and Scarpetta, 2004). Previous research has confirmed that strict EPL increases the overall incidence of temporary employment (Booth et al., 2002a; Kahn, 2010). In countries where regular employment is only weakly regulated there are fewer incentives to hire workers on fixed-term contracts. The deregulation of temporary work should hence be less consequential in such contexts. If it is true that strict EPL leads to a disproportionate exclusion of female workers from permanent jobs (as asserted by neo-classical theory), a deregulation of fixed-term jobs should mainly affect women. If deregulation creates jobs for women who would otherwise be shut out of employment this could be a positive effect. However, if the use of temporary employment contracts increases at the expense of permanent employment (substitution effect) the deregulation of temporary work would disadvantage women's labour market position.

### Public Spending on Families

While the theoretical discussions on the implications of protective labour market institutions for gendered inequality in labour market outcome focus on the employer rationale (i.e. the demand-side perspective), the classical literature on gendered employment tends to focus on women's choices (i.e., the supply-side perspective) in the context of traditional gender role ascriptions and inadequate public care infrastructures which constrain women's employment options when they have small children. It is well-established in the literature that institutional support to workers with care responsibilities has important repercussions for gendered labour market outcomes. Research has found important differences between the effects of the provision of cash benefits to carers (e.g. child allowances, income support during maternity and parental leave) and the provision of care services (Jaumotte, 2003; OECD, 2011). While the effect of family support *in cash* for female employment outcome is ambivalent, the public provision of affordable childcare services has unambiguously been shown to facilitate female employment and women's continuous careers (see Steiber and Haas, 2012 for a review). Against this backdrop, we would predict state support to families *in kind* (covering the provision of childcare services) to have positive implications for female employment, supporting their capability to maintain continuous careers in regular employment and allowing them to work full-time (Connelly and Kimmel, 2003). This is based on the assumption that an adequate provision of childcare increases women's options to follow continuous careers as labour market insiders. A focus on state support to families on *cash benefits*, by contrast, provides incentives for women to leave the labour market and to act as state subsidised home-carers and may thus increase women's risk of peripheralised employment and labour market exclusion.

### The Public Sector as Employer

The welfare state structures female employment in two ways: in its provision of childcare and other financial support to families – as outlined above – and in its role as employer (Mandel and Semyonov, 2006). By providing working conditions which support women who want to combine paid work with child care responsibilities – e.g. flexible working hours, part-time work and high levels of employment protection – the public sector is an attractive employer for women. Accordingly, research has shown that public sector size explains a portion of cross-national differences in female



employment with large public sectors often associated with high female employment rates (e.g. Mandel and Semyonov, 2006). In countries with a large public sector women's risk of being labour market outsiders is hence substantially lower. At the same time, the size of the public sector has been used to explain the 'welfare state paradox', where progressive (and large) welfare states that foster women's employment are seen to simultaneously increase occupational gender segregation and limit female occupational attainment (e.g. Mandel and Semyonov, 2006). In other words, public sector employment tends to channel women into "feminine occupational niches" (ibid., p.1916) whilst also diverting them from lucrative, high-paying positions in the private sector. In line with this argument Yaish and Stier (2009) show that cross-national differences in the gender gap in job authority is higher in the public sector than the private sector. They also find support for the selection hypothesis, that women prefer public sector employment as it allows them to balance work with family responsibilities. This is an important finding as it underscores the role of the state in its provision of employment 'sheltered' from market forces. Indeed the portion of the gender pay gap attributed to pay discrimination has been found to be smaller in the public sector than the private sector, with the public sector seen as able and willing to enforce equal pay legislation (Jurajada, 2003).

While the problematic implications of the public sector for female occupational attainment are widely acknowledged, recent work also challenged the assumption that the public sector *per se* offers women higher levels of protection than the private sector. Ellenguth and Kohaut (2011) find little difference between the public and private sector in the extent to which temporary jobs are offered in Germany. Similarly, in the UK there is evidence that public sector workers on temporary contracts have lower transitions to permanent jobs than in the private sector (Booth et al., 2002b). In Spain, there is evidence of a sharper rise in temporary employment use in the public than the private sector (Dolado et al., 2002).

Additionally, the relation between public sector size, industrial relations and employment conditions differs across countries. There is, for example, substantial variation across countries in the extent to which the public sector can be assumed to be more highly unionised: Waddington (2005: p. 6) finds considerable variation in the proportion of unionised workers in the public sector by country, ranging from 29-82 percent. That the public sector means different things in different countries is also evidenced by Mandel and Semyonov's (2006) finding that the impact of welfare state policies on women's tendency to work part-time is only observable when the analytic sample excludes the former socialist countries of Central and Eastern Europe. Moreover, published data shows that some countries with the highest female employment rates in Europe (e.g. Portugal and the Czech Republic) have very low levels of public sector employment (OECD, 2009). So the implied relationship between public sector size and female employment rates can be inconsistent.

In combination, these findings suggest that the public sector is a category which - while theoretically interesting - empirically appears to be a hold-all-category for different protective features of employment legislation and trade unionism, and one which has different meanings in different institutional contexts. For these substantive reasons, but also based on methodological grounds, which are explained in detail in the following section on *Operationalisation, Data and Methods*, the size of the public sector as such will not enter as a predictor in our empirical analyses. We do, however, control for the generosity of the welfare state supporting maternal employment through the provision of in kind services such as childcare (as discussed in the previous section). Finally, it is not too grandiose a claim to suggest that countries with high rates of spending on families also tend to have large welfare states. Indeed our indicator of spending on families correlates very highly with public sector size ( $r=0.87$ ) using the latest available data from the OECD (2009). So while public sector size and spending on families are not quite the same thing, the empirical overlap is considerable.<sup>3</sup>

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<sup>3</sup> We use the OECD (2009) indicator measuring "Employment in general government as a percentage of the labour force" that is available for the year 2005 for 15 of the countries analysed in the present study. This indicator correlates with the 'in kind' family policy indicator described in the Appendix tables A1 and A2.

## Operationalisation, Data and Methods

### Data and Sample

The paper deploys repeat cross-sectional data from the EULFS. It covers 18 countries over a period of up to 16 years (1992-2007). Table A1 in the appendix provides full information on the sample. The EULFS is cross-nationally comparable, providing standardized individual-level labour market data. The EULFS has two central strengths: its considerable sample size, allowing an assessment of sub-populations of interest, as well as the length of its time-series (cf. Eurostat 2005 for detail). The following countries are analysed: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, and the UK. Since for Germany harmonized EULFS data only became available in 2002, we draw instead on the German Mikrozensus (GMZ) which provides for a longer time-series (1995-2007). We do not include later years because the Great Recession that started in 2008 in most countries had very gender-specific employment effects that were to a great extent unrelated to the labour market institutions under study. Men were disadvantaged in terms of job loss because they tended to be concentrated in the hardest hit industrial sectors (see Arpaia and Curci, 2010). Employment declines within industrial sectors, however, were fairly equal for men and women (see e.g. Cho and Newhouse, 2013). Hence, including the peak recession years in our study would involve breaks in our time series of gendered labour market outcome that are unrelated to institutional change. Our EULFS micro-data are complemented by high-quality time-series data on institutional change from the OECD, the World Economic Outlook (WEO) and the ICTWSS database (for details see Table A1 in the appendix).

We compare men and women in their early to mid-forties. Our analytic sample includes over 2.5 million individuals aged 40-44 years nested within 18 countries. The focus on this particular age group has been motivated by the following: First, most women in this age group will have already re-entered (or attempted to re-enter) the labour market after a potential childbearing-related employment interruption. At the same time, this is a life-cycle stage in which most women have non-adult children. Second, by analysing an age group unlikely to be on maternity leave we also decrease the risk of misclassifying new mothers' labour market status. This is important as cross-national variation in maternity leave entitlement and benefits means that in some countries' EULFS data women on maternity leave are classified as employed while in others they are classified as inactive. Finally, the focus on this specific age-group has the advantage that gender effects on employment outcomes can be studied that are not confounded by gender-specific age effects. In terms of labour market prospects, women are considered 'old' earlier than men because they tend to retire substantially earlier. They may in fact already suffer from age discrimination by age 45.

### Statistical Method and Variables

#### *Dynamic multilevel modelling*

We apply a *dynamic multilevel modelling method* to estimate the impact of institutional change on gendered labour market outcomes. The dynamic component derives from the fact that we use data from 18 countries that provide data for up to 16 years. Overall, we have data from 205 country-years (see Table A1 for the number of years contributed by each of the countries). Using these data, we follow a *two-step multilevel modelling approach* that uses estimated parameters obtained from individual-level regressions carried out for each country-year (step-1) as dependent variables in country-panel regressions (step-2). Our strategy, in more detail, is as follows:

In *step-1*, we use the harmonised repeat cross-sectional micro data described above and run multinomial logistic regression models of women's and men's labour market status (differentiating

between seven different statuses, see below for detail). These models are estimated separately for each of the 205 country-years, controlling for sex and education (differentiating three levels: lower secondary (ISCED 0-2; 3c if shorter than 2 years), upper secondary (ISCED 3-4) and tertiary (ISCED 5-6)). On the basis of these 205 step-1 regressions we then estimate *predicted probabilities* for each of the seven categories of our dependent variable, separately for women and men, and pertaining to individuals with medium levels of education that represents the modal skill level of respondents. It is important to note that this step of the analysis is descriptive rather than explanatory. It applies very parsimonious models used to predict the distribution of male and female employment (at age 40-44 and medium levels of education) across seven different labour market outcomes. Previous work has regularly drawn on published rates of employment and unemployment for similar purposes. Our analysis goes further insofar as we are able to focus on a very specific population group for which no official data is published. Moreover, estimating the shares of the population in different statuses ourselves using micro-data, we are able to provide a holistic and nuanced analysis of a broad range of labour market statuses .

In *step-2*, the 205 *predicted probabilities* for each category of our step-1 outcome variable are used as the dependent variables in country-panel regressions, using a fixed effects approach. Our central explanatory variables in these step-2 regressions are time-varying country-level covariates that measure the level of *employment protection* of permanent jobs, the *regulation of temporary work*, *union strength* (collective bargaining coverage), and *public spending on families* (distinguishing between cash and in kind). Each model also contains controls for GDP per capita, and annual change of GDP per capita, as well as skill supply (cf. Tables A1 and A2 in the appendix for full details on these variables). Since some of our macro-variables show correlations of medium strength (e.g. family benefits, GDP and skill supply; cf. Table A3 in the appendix), we ran some sensitivity tests on our models, which suggested that the correlations were unproblematic to the results presented here. In order to account for the temporal order of labour market developments and policy change we lag our institutional and macro-economic variables by two years (a strategy recommended by Mourre, 2006). Through the inclusion of time dummies (creating year-specific intercepts) we capture developments over time common to all countries (e.g. economic shocks that occur in the same year for all countries). Through the inclusion of dummy variables for each country, we estimate country fixed effects models (FE) that control for all unobserved factors at the country-level that are time-invariant (e.g. stable institutional differences). The central advantage of using a fixed-effects approach is that we are able to largely circumvent endogeneity problems inherent in cross-sectional comparative work (see also Gebel and Giesecke, 2011). Another implication of our strategy is that our results from this dynamic multilevel modelling can be interpreted as estimates of the effect of changes in the institutional context on employment outcomes.

In step-2 of the analysis the error term is composed of the error associated with the fact that the dependent variable is *estimated* (from regressions at step-1) rather than observed, and of the habitual residual variance from the model (see Lewis and Linzer, 2005; Hanushek, 1974). Due to varying precision with which predicted probabilities are estimated we apply weights to step-2 regressions. We follow Lewis and Linzer's approach (2005: pp. 351), which assigns greater weight to more precisely estimated predicted probabilities.

Under certain conditions the two-step approach is considered superior to standard multilevel models that estimate both steps of the analysis simultaneously (see special issue in *Political Analysis* 2005, Volume 13). It is considered ideal for data which have a large N of level-1 observations but only a small N of level-2 units (ibid.; see also discussion by Heisig, 2011), as is the case with our data (we look at over 2.5 million level-1 observations nested in 18 countries). Additionally, the two-step approach is more flexible in terms of the specification of individual-level associations (simultaneous multilevel models require the majority of level-1 effects to be specified as fixed, i.e. as equivalent across countries). In this way, account can be taken of a greater number of cross-level interactions without facing convergence problems (Primo et al., 2007). For these reasons two-step models have become increasingly popular in sociological work with a cross-nationally

comparative perspective (e.g. Gebel and Giesecke, 2011; Heisig, 2011) and are now considered state of the art by many.

### *A comprehensive analysis of employment outcomes*

In our step-1 regressions we distinguish five employment outcomes (permanent full-time employment, permanent part-time employment, temporary work, marginal employment, and self-employment) and two non-employment outcomes (unemployment, inactivity). Those who have been working at least one hour in the reference week, or who have a job from which they are temporarily absent count as employed. Permanent employees are those holding a work contract of unlimited duration, while those with contracts of limited duration count as temporary workers. We classify full-time workers as those working at least 30 hours a week. Part-time workers are those who work between 15 and 29 hours a week. Respondents who work less than 15 hours, or who are family workers, fall into the marginal work category (irrespective of contract type). All non-employed individuals who have been seeking employment in the past four weeks and are available for work are categorized as unemployed. Those who are not actively seeking employment because they have already found a job are also included in the 'unemployed' category. All non-employed respondents to whom these criteria do not apply are considered to be economically inactive (e.g. discouraged workers, ill or disabled persons).

Our outcome variable examines the full range of potential labour market statuses. Since the entire sample population is covered by one of the seven labour market outcomes, a positive effect of institutional change on one outcome necessarily implies a negative effect on one of the other outcomes. This thus affords us with an understanding of labour market dynamics following institutional change. If institutional change is found to increase part-time employment, for example, we can see whether it does so at the expense of full-time employment (a potentially negative outcome) or by lowering the rate of unemployment (a positive outcome). Analysing a very wide set of possible labour market outcomes is an important asset of our analytic strategy. Evidently, even this nuanced approach of distinguishing employment outcomes of different quality (based on the assumption that permanent full-time employment is of greater comparative worth than part-time employment or temporary work) is at risk of grouping heterogeneous outcomes. One obvious example - given the focus of this paper on gender inequality in the labour market - is part-time work. While part-time employment is often praised as facilitating the combination of paid work and care responsibilities, it is associated with inferior status jobs with low opportunities for promotion and skill development and lower hourly pay. While some, so called 'retention part-time jobs' are of good quality, often offered to high skilled women who are some of the few in a position to negotiate reduced hours whilst retaining their post (Gash et al., 2012), the majority of part-time work in Europe is still associated with "in low-paid, low status-jobs" (Kalleberg, 2000). This heterogeneity in part-time jobs has been the focus of much debate (e.g. Tilly, 1996). With the data at hand it is not possible to fully account for the heterogeneity in part-time jobs. While the EULFS would have provided us with the opportunity to differentiate between voluntary and involuntary part-time work, this distinction would not be very useful to differentiate between "good" and "bad" part-time work, because the overwhelming majority of part-timers claim to work part-time voluntarily. For instance, in 2007, the last year we observe in our time series, only 17 percent of all female EU part-timers were involuntary part-timers (OECD, 2014). While we are thus not able to effectively differentiate between "good" and "bad" part-time jobs, our operationalization entails that our part-time category does not contain any obviously precarious arrangements as we include those on permanent contracts only. This is an important distinction also in light of findings by Gash and Inanc (2013), which suggest that contract type may be a more important predictor of job quality than working time. Further differentiation could have included a distinction between part-time and full-time fixed-term employment and voluntary and involuntary inactivity. We believe, however, that any further differentiation would have come at the price of coherence and readability. The very

detailed account we offer is already a rarity in current labour market research. Furthermore, a distinction of fixed-term workers by part-time would have been a case of ‘splitting hairs’ for most countries, with too few cases to warrant analysis especially when it comes to male temporary part-time workers.

### *Interactive model of regulation and protection*

In our step-2 country-panel models, we account for the fact that the effect of institutional change is likely to be context-dependent. As outlined in the theory section, we expect the deregulation of temporary work to have different implications in contexts where employment protection for standard contracts is strict compared to contexts where it is loose. It was also predicted that changes in collective bargaining coverage will be mediated by the level of coordination of the wage-setting system. In order to account for such context-dependencies, we estimate interaction effects to test how the effect of deregulation of temporary work varies between high and low employment protection contexts and how the effect of collective bargaining coverage varies between low, medium and high coordination contexts. The variables accounting for context are measured as time-constant. So while our main effect for employment protection legislation is measured in a time-varying manner (measured on a scale from 0-6), when we test how the effect of deregulation of temporary work varies across high and low EPL contexts, a time-constant dichotomous measure is used (with low EPL referring to values below 2.17) . This was possible, because despite the change over time in our EPL indicator, countries did stay within the same category (high/low) throughout the entire observation period. The time-constant variable measuring coordination follows a similar logic (please see Table A2 for more detail). To facilitate the interpretation of these interactions, the coefficients are already presented as the sum of main and interaction effects. This means, for example, that coefficients presented for CBC can be directly interpreted as the effect of increased coverage in the respective coordination context.

### *Exclusion of the Public Sector*

As noted earlier, previous work has sought to measure the effect of public sector size on gender differences in employment as well as in occupational attainment. As discussed in our theory section, we have a number of substantive reasons for not including sector as a predictor in our analyses. Aside from these there are also methodological and data-related reasons for not doing so. First of all, public sector would present a weak predictor in dynamic models of employment outcome, due to its high degree of stability over time (see OECD 2009 for evidence of lack of change over the period 1995-2005 in the share of public employment as a percentage of the labour force). Second, and even more importantly, the indicator of the size of the public sector is not available for all countries in our analyses and it is certainly not available for the long time-series that we analyse. For this reason, it is not possible – even if we had wanted – to include the change in public sector size in our analyses. At least we do not include change in the public sector measured as *proportion of the labour force working for the government*. We do include, however, change in welfare state generosity – both in kind and in cash – for families in our models.

## **Results**

### Time Trends in Gender Inequality in Labour Market Participation

Figure 1 presents the descriptive step-1 estimates. These figures show that in almost all countries under study notable gender differences in forms of employment outcome exist. They reveal substantial cross-national variance in the extent of these differences but also in the time trends

therein. We find strong and persisting gender differences in standard employment rates. The countries showing the largest gender gap in full-time employment rates are Austria, Belgium, Germany, Italy, the Netherlands, Norway and the UK. Some countries also show a narrowing in the gender gap in standard employment, with Sweden, Denmark and Norway showing some positive gains for women. The findings for part-time permanent employment, which despite its permanent status is typically associated with inferior conditions, are mixed. There is considerable cross-national variation in part-time rates. Some countries, the Netherlands most notably, have an extremely high part-time employment rate while in other countries part-time employment rates are low (e.g. the Central and Eastern European countries, Portugal and Finland). In those countries, where part-time work is wide-spread, the gender gap in part-time work tends to be very large. Most crucially for our analyses there are considerable differences in trends overtime. The UK, Norway and Germany have very high and stable part-time rates, while others show rising rates of female part-time employment (Austria, Belgium the Netherlands, and to some extent Italy) and in some countries part-time employment is declining (Denmark and Sweden). It would appear vital to learn if institutional change is behind these trends and to understand the mechanisms behind the generation/or suppression of a part-time employment sector. Temporary employment and marginal employment while consisting of smaller shares of total employment again are disproportionately populated by women. Labour market 'inactivity' is again clearly gendered. In some countries, however, the gender gap is quite small (in the Nordic and the CEE countries) and there is also clear evidence that it is declining as a labour market category in many countries. The review of these gender differences in labour market status overtime confirms the relevance of a research strategy which seeks to establish the mechanisms behind the observed changes. Which macro-economic structures, if any, support women's integration to the standard employment contract?

[Figure 1 about here]

#### Institutional change and its effect: Macro-Level Regressions

The purpose of our step-2 analyses is to test whether institutional changes have affected the observed trends and thereby to understand the institutional mechanisms which serve to integrate or segregate women's labour market experience. As noted before, our step-2 regressions (though independently estimated) relate to each other, because the predicted employment outcomes that serve as the dependent variables sum up to 1 (or a hundred percent). Moving across the columns of Table 1, the regression coefficients therefore sum up to zero. This affords us with a detailed understanding of labour market dynamics. It allows us to observe what a development in one outcome is actually driven by: if we find, for example, that rising collective bargaining coverage (CBC) leads to a reduction in female inactivity, we can determine whether this is accompanied by an increase in permanent full-time or part-time employment or by an increase in marginal or fixed-term employment. Such an analytical perspective allows us to engage directly with research that has sought to examine the quality of the labour market experience (covering issues of female labour market segregation) rather than a simple assessment of participation rates. Before discussing our substantive results, it is worth briefly noting that the country fixed effects were highly significant in all models, while the time effects were insignificant. The significance of country effects on employment outcomes is not surprising given the amount of cross-national variation shown in Figure 1. Their inclusion in the models ensures that all differences between countries that are time-constant (such as stable institutional differences) are controlled for, so that any remaining effects pertain to change over time. The non-significance of our time-dummies indicate that during the time period under observation there were no economic (or other) shocks common to all countries studied. The coefficients of our control variables are not presented here, but are available upon request.

### *Employment protection legislation*

In our sample of countries declines in the strictness of EPL were more common than increases. Spain, where the EPL indicator has changed from 3.9 to 2.5 throughout our observation period (see Table A1 in the appendix), exhibits the greatest declines in EPL. Also note that we observe substantive reductions only in countries with high levels of EPL (cf. Table A1). Our findings are hence driven by countries which reduced the strictness of EPL from a high starting point.

Our results shown in Table 1 indicate that increasing levels of employment protection would have had a positive effect on male employment outcomes: a one-unit increase in our EPL variable (measured on a scale from 0-6, with 6 denoting strict protection of employment on regular contracts) would raise men's probability of permanent full-time employment by about 3.6 percentage points, while reducing the rate of temporary and self-employment by around 1.9 and 2.3 percentage points, respectively. At the same time, men's risk of unemployment would increase by 1 percentage point, but this effect is only marginally significant. Male self-employment also plays a central role in the employment dynamics we observe. In line with the literature, we observe that an increase in the strictness of EPL would curb self-employment (e.g. Robson, 2003). That enhancing the strictness of EPL would reduce the rate of self-employment may be seen as a positive effect in light of recent work that distinguishes between two types of self-employment: 'independent self-employment' (freely chosen) and 'dependent self-employment' (an enforced re-classification of former employees as self-employed contractors). Román et al. (2011) suggest that stricter EPL tends to suppress the precarious forms of quasi self-employment predominantly used by employers to reduce non-wage labour costs. While we are not able to distinguish between dependent (or quasi) self-employment, the literature suggests that a substantial share of reported self-employment is dependent self-employment that is considered precarious with high flows from and to unemployment (Taylor, 2011). Against this backdrop, we consider permanent full-time employment to be preferable to self-employment. Another central finding was that increasing the strictness of EPL would significantly decrease temporary employment. The literature consistently reveals the inferior worth of temporary employment relative to regular employment (e.g. Mertens and McGinnity, 2004; Giesecke and Groß, 2003). In sum then the trend of deregulation of EPL that has taken place in some of the countries we observe appears to be detrimental for men's labour market outcomes.

Women's employment outcomes are also affected by EPL, albeit less markedly. We find that an increase in the strictness of EPL would have reduced their risk of holding a temporary contract (by 1.5 percentage points) and would have also reduced their employment in permanent part-time jobs (though this effect is only marginally significant). Thus, while we find some evidence that an increase in the strictness of EPL would have reduced female employment, the results do not suggest a substantial negative effect as the neo-classical perspective predicts. Most importantly, we find no evidence that stricter EPL would impact the rate of regular employment for women. However, we also do not find statistical evidence of the beneficial employment effects of stricter EPL for women as predicted by our counter-hypothesis.

In sum, the trend of EPL deregulation captured by our data may indeed help to alleviate gender inequality in outcome. This effect, however is driven by the negative implications for male permanent employment rather than by substantially improving employment outcomes for women.

[Table 1 about here]

### *Deregulation of temporary work*

Temporary work has been deregulated over the observation period in the majority of the countries under investigation (see Table A1). As one would expect this trend has occurred somewhat more frequently in countries where standard contracts are highly protected. Nevertheless, deregulation of temporary work also played a central role in countries with low levels of EPL. Italy, for example, is a country with low levels of EPL, but has experienced the most severe deregulation of temporary work in our whole sample: from 5.4 to 1.9 (see Table A1).

Our evidence from the country panel regressions suggests that such deregulation has similar implications for male labour market outcomes in high and low EPL contexts: the deregulation of temporary work reduces men's probability of employment on a full-time permanent contract, while increasing their risk of unemployment and especially self-employment. Regarding women, our results establish a strong interaction effect between the deregulation of temporary work and the degree to which regular permanent employment is protected. In institutional contexts where regular contracts are highly protected, the deregulation of temporary work leads to a substantial decline in female inactivity rates, while permanent part-time work (marginally significant), marginal part-time work and self-employment increase. In low EPL contexts, by contrast, the effects are unequivocally negative: women's probability of full-time permanent employment is substantially decreased (with a shift to marginal part-time work and self-employment).

In sum, we find little evidence for the assertion that it is mainly women who are (adversely) affected by the deregulation of temporary contracts. To the contrary, in contexts of strict EPL, the deregulation of temporary work appears to boost employment levels (permanent part-time work, marginal part-time work and self-employment). For men, by contrast, deregulation of temporary work has unequivocally negative implications irrespective of EPL environment. Moreover, our results reveal that – at least for our sample of mid-aged individuals – the partial deregulation hypothesis in general receives little support: there is no evidence that the deregulation of temporary work is more consequential when the regulation of permanent contracts is rigid. Furthermore, and relatedly, it is striking that the deregulation of temporary work has no implications for the volume of temporary work in mid-life. Note, though, that existent work concerned with young workers aged below 30 years has provided evidence in favour of the partial deregulation hypothesis (e.g. Dieckhoff and Steiber, 2012).

#### *Collective bargaining coverage*

We observe a mixed time trend in collective bargaining coverage. Five of the countries under observation experienced a major change in collective bargaining coverage amounting to at least ten percentage points, of these four experienced a decline. Notably, three out of these four dramatic declines occurred in countries which already had low levels of collective bargaining coverage at the beginning of our observation window. The one dramatic increase occurred in Denmark which already had high levels of collective bargaining coverage at the outset. A substantial change of at least five (but less than 10) percentage points was experienced by four countries in our sample, out of these three experienced an increase. All of these changes took place in countries with already high levels of collective bargaining at the outset.

Our results on the impact of collective bargaining coverage (CBC) contradict the neo-classical expectation that influential trade unions have negative employment effects for women. Instead, we find that an increase in CBC leads to positive employment effects for *both* men and women. Its effect depends very much on the level of coordination, however.

For men, we observe positive employment outcomes as a consequence of increased CBC for both medium and high coordination contexts. At medium coordination levels (e.g. found in Denmark, Portugal, Spain and Sweden) a one unit increase in CBC (which pertains to a 10 percentage point increase in CBC) would boost men's probability of full-time permanent employment by almost 5 percentage points, while reducing their unemployment risk by almost 2 percentage points (though this latter effect is only marginally significant). At high levels of coordination, increased CBC also leads to a notable growth of the standard employment contract (by about 4 percentage points) and does so while reducing self-employment by a similar extent. In low coordination contexts increased CBC raises men's unemployment probability, however.

For women, positive effects are most clearly observed for medium levels of coordination. In such a context a 10 percentage point increase in CBC would augment women's probability of full-time permanent employment by 7.1 percentage points at the expense of unemployment, permanent part-time work, and marginal part-time employment (these are reduced by 2.8, 5.5, and



1.3 percentage points, respectively). Our models would hence predict negative trends in female employment outcome for a country like Portugal which has medium levels of coordination and experienced a reduction in its CBC by 10 percentage points (see Table A1 in the appendix for overview). In low and high coordination contexts increased CBC levels reduce inactivity. In high coordination contexts, our coefficient also suggests a positive effect of CBC on full-time permanent employment for women, but the effect is notably smaller compared to medium coordination contexts and fails to reach statistical significance.

In sum, our findings provide no evidence in support of the neo-classical perspective. Increased union power, measured here as growth in CBC, does not appear to price women out of (permanent) employment. Instead, increases in union strength are shown to have beneficial effects on men's and women's likelihood of being employed on a permanent and full-time employment contract. Notably, there is no indication that the employment outcomes of increased CBC are more positive in high coordination contexts than in medium coordination contexts. We hence find no clear support for the political economy perspective regarding the role of coordination, or for the 'hump-shape' hypothesis. What is important to note, though, is that irrespective of the coordination context CBC growth has no negative employment outcomes for women.

#### *Public Spending on Families*

Most countries under investigation have increased the level of public spending on families in the period under observation (see Table A1 in the appendix for overview) both in terms of in kind services and cash benefits. In some countries the change is quite remarkable. The UK, the Netherlands and Belgium have made quite dramatic changes in expenditure in services *in kind*. Our analysis reveals a significant impact of public expenditure *in kind*, covering childcare services predominantly, on women's labour market status. We observe clear positive employment effects. Increased public spending on *in kind* family support raises women's permanent part-time employment whilst reducing unemployment and marginal part-time work. This is in line with our prediction that state support to families *in kind* should have positive effects on female employment outcomes. Turning to public spending in the form of cash benefits (income support or benefits paid directly to families), we find women to be negatively affected. We observe an increase in their unemployment risk while their temporary employment is reduced. These results provide support to the argument that cash benefits can have detrimental outcomes for women, while in kind expenditure on families is conducive to positive employment outcomes. Since men's labour supply is comparatively unaffected by care responsibilities, we would expect fewer effects of state support to families on their employment outcomes. Our results confirm this expectation in terms of *in kind* support to families. They also suggest, however, that increasing levels of cash support to families reduce men's likelihood of being self-employed or in temporary work. The latter effects are rather small and may be spurious, i.e. being driven by other dimensions of institutional change that correlate with rising levels of cash support to families.

#### Conclusion and Outlook

The aim of this paper has been to empirically test the impact of labour market institutions on gender inequality in labour market outcome. We examined whether employment regulation and protection, union strength, and wage-setting coordination drive inequality dynamics amongst the mid-aged and medium educated male and female workforce (focusing on women and men aged 40-44 years). These labour market institutions are generally theorised to shape gendered inequality in labour market outcome through their effect on labour demand rationales. Accounting also for institutions that affect labour supply, we furthermore considered the implications of family policies. We have run country-panel regressions based on data from 18 European countries spanning the period from 1992-2007 and provide important insights into the labour market dynamics of institutional change. Our use of time-series data and fixed-effects modelling brings us closer to making causal claims

regarding institutional effects than most of the existing work in this area. The institutional effects we establish are averages, however. We have to be aware that there may be differences in 'gender relations' and 'gender regimes' between societies, and that, therefore, institutions and institutional change will not always operate in comparable ways across countries (see Rubery, 2011: p. 1107). Nevertheless, we believe that our analytical strategy has afforded us with important insights into the labour market dynamics of institutional change and their implications for gendered outcome.

Our findings provide little support for the neo-classical claim that labour market deregulation will increase gender equality in employment chances. The closest we came to confirming such claims was the result that men benefitted more clearly from stricter employment protection than women. For women, no positive effects of tightening employment protection were found, but neither could any strong negative effects be discerned (in terms of reduced permanent employment or increased inactivity or unemployment). So, we do find some evidence that a deregulation of EPL could mitigate gender inequality in access to regular employment. However, the potential of EPL-deregulation to reduce gender inequality is driven predominantly by the negative effects for men, but crucially not by mechanisms that increase women's access to the standard employment contract.

Regarding the deregulation of temporary contracts we found no indication that women would be more adversely affected than men. To the contrary, our results for women suggest that the detrimental effect in terms of reduced employment on permanent full-time contracts is limited to national contexts where regular employment protection is low. Men experience unequivocally negative employment effects of deregulation independent of how strongly regular employment is protected. Our findings hence provided no support for the hypothesis that women – as labour market outsiders – would be disproportionately affected by the deregulation of temporary work.

The finding of this study which most strongly challenged neo-classical theoretical accounts pertained to the effect of unionisation. We found no indication that increases in union strength would crowd women out of employment. Instead our results indicate that women can benefit substantially from increased collective bargaining coverage. Specifically, in contexts with medium levels of coordination increased collective bargaining coverage boosts women's employment on standard contracts while decreasing their risk of unemployment and marginal employment. Increases in union strength also proved to exert positive employment outcomes for men. There was no indication, however, that they benefitted more than their female counterparts. Our results hence provide no support for the hypothesis that unions protect male workers' interests at the expense of women.

Finally, we found that family policies have strong implications for gender inequalities in employment outcome. Increased state support to families in kind (i.e. childcare infrastructure) significantly increases women's permanent part-time employment rate while *simultaneously reducing their risk of unemployment and marginal employment*. To put it another way, in countries with decreasing rates of expenditure in childcare women who would have been in permanent part-time employment would find themselves moving into unemployment or marginal employment. In order for in kind policies to narrow the existing gender inequalities in employment, they would also need to facilitate women's full-time employment, however. An interesting avenue for future research would be to establish under which conditions and in which institutional contexts increased spending on childcare positively affects women's ability to enter full-time employment.

In sum, our analyses have shown that gender inequality in employment outcome is substantially affected by institutional change. We found no support for the neo-classical theory, that deregulation could increase gender equality in employment outcomes. Rather, we found that stronger unions can help raise women's chances of employment on the standard employment contract. Finally, while our main attention was on 'classical' labour market outcomes, we observed that self-employment (especially for men) and marginal work (especially for women) played a relevant role in the employment dynamics triggered by institutional change. Given that these types of labour market outcome have central implications for labour market inequality this again

underscores the value of our research strategy that accounts for the full range of possible outcomes to understand the employment dynamics of institutional change. Our research strategy of examining such a comprehensive set of outcomes has meant, however, that we were not able to examine how the effects of institutional change on female employment outcomes vary for low-and high-skilled women. This would be an interesting avenue for future work in this field.

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**Figure 1: Step-1 estimates of predicted probabilities for seven labour market outcomes**





Figure 1 (continued)



*Notes:* The figures show predicted probabilities of 7 different labour market outcomes separately for women and men. The sum of the predicted probabilities across all outcomes sum up to 100% in each of the countries and survey waves 1992-2007.

**Table 1: Institutional Change and Labour Market Outcomes, Fixed-Effects Estimates (EDV), women and men aged 40-44 years**

	Permanent Full-time	Permanent Part-time	Temporary	Unemployed	Inactive	Self-Employed	Marginal Part-time
<b>MEN</b>							
Protection of regular contracts (EPL) (a)	3.58**	-0.19	-1.88***	1.04+	-0.55	-2.34**	0.34***
Deregulation of temporary work (b)	High EPL	-1.97**	-0.01	0.12	0.70+	-0.26	1.27*
	Low EPL	-1.59***	0.00	-0.12	0.37*	0.24	1.17***
Collective bargaining coverage (CBC in 10%) (c)	Low COORD	-1.39	-0.20+	0.16	1.41*	-0.36	0.20
	Medium COORD	4.90**	0.31	-0.60	-1.87+	-0.72	-1.72
	High COORD	4.21*	0.08	-0.06	0.79	-0.68	-4.14**
Public spending on families (in 100 \$ p.c.)	Cash	0.59	0.26**	-0.46**	0.35	0.17	-0.84*
	In kind	0.54	-0.13	0.24	-0.01	-0.39	-0.29
<b>WOMEN</b>							
Protection of regular contracts (EPL) (a)	1.80	-2.30+	-1.51**	0.91	1.02	0.16	-0.08
Deregulation of temporary work (b)	High EPL	-0.33	1.44+	-0.40	0.21	-2.74**	0.64*
	Low EPL	-1.52**	0.25	0.23	-0.01	0.15	0.50*
Collective bargaining coverage (CBC in 10%) (c)	Low COORD	-0.09	-0.11	0.50	1.06	-2.24*	0.43
	Medium COORD	7.06**	-5.47*	0.49	-2.77**	2.20	-0.20
	High COORD	2.47	-0.86	0.68	0.04	-2.92+	0.44
Public spending on families (in 100 \$ p.c.)	Cash	0.69	0.24	-0.62*	0.74**	-0.83	0.08
	In kind	0.33	1.84*	-0.16	-0.77*	-0.43	-0.19

Notes: Summary of results from separate fixed effects (FE) regressions for 7 dependent variables (predicted labour force status, measured in % of population in permanent full-time work, permanent part-time work, temporary work, unemployment, inactivity, self-employment and marginal part-time work, refer to Figure 1 for an overview). For each of our level 2 regressions we have a sample of N=205 cases (i.e. for each of our seven outcomes we have 205 predicted probabilities that vary by country and time, for number of country-years contributed by each country see Table A1). All of the macro-variable predictors are lagged by two years (Tables A1 and A2 for detail on predictor and control variables). The level 2 regressions also control for: GDP per capita, growth in GDP per capita, skill supply, year dummies and country dummies, though these variables are not shown in the table above (Tables A1 and A2 for detail, full estimation results are available from the authors upon request). All estimates are based on FE regression models that are corrected for potential bias from estimated dependent variables (EDV) following Lewis and Linzer (2005). (a) EPL measured as a continuous variable, controlled for levels of deregulation; (b) the effects of deregulation for the high and low EPL contexts are estimated by two regressions: deregulation of temporary work once interacted with a time invariant dummy in which 1=high EPL and once interacted with the inverse of the dummy in which 1=low EPL. (c) The degree of CBC is interacted with three different sets of dummies representing the degree of wage coordination measured by three time-invariant categories (high, medium, low).

\*\*\* p<.001 \*\*p<.01 \*p<.05 +p<.10

**APPENDIX**

**Table A1: Overview of time-series coverage and macro-level variables, by country**

		Macros: values at start and end of country-specific observation window (b)									
Years included (a)		GDP p.c. in \$1000	GDP change in %	Skill supply in %	Public spending on families		Labour market regulation (c)		CBC in %	COORD (time invariant)	EPL (time invariant)
					in kind	in cash	EPL	TEMP			
Austria	1995-2007 (#13)	21.1-33.9	0.4-2.5	69-80	91-159	557-809	2.9-2.4	1.5-1.5	99-99	high	high
Belgium	1992-2007 (#16)	17.9-32.0	3.1-2.2	50-68	22-303	401-531	1.7-1.7	4.6-2.6	96-96	high	low
Czech Rep.	1999, 2003, 2006, 2007 (#4)	13.7-20.3	-0.7-6.3	86-91	18-115	229-237	3.3-3.3	0.5-0.9	55-44	low	high
Denmark	1992-2007 (#16)	18.6-33.5	1.6-2.4	74-76	341-614	261-519	1.7-1.6	3.1-1.4	69-82	medium	low
Finland	1995-2007 (#13)	16.2-30.4	-0.9-2.8	67-81	246-418	428-487	2.5-2.2	1.9-1.9	82-90	high	high
France	1993-2007 (#15)	18.9-30.5	1.0-1.9	56-69	187-482	263-412	2.3-2.5	3.6-3.6	93-95	low	high
Germany	1995-2007 (#13)	20.4-30.5	-0.8-0.7	81-84	162-224	262-436	2.7-3.0	3.8-1.3	70-63	high	high
Greece	1992-2000, 2005-2007 (#12)	13.0-25.4	0.0-2.9	37-60	37-99	48-177	2.3-2.3	4.8-3.1	80-85	high	high
Hungary	2003, 2005-2007 (#4)	12.9-16.9	4.1-4.0	74-79	149-208	249-321	1.9-1.9	0.6-1.1	34-35	low	low
Italy	1992-2007 (#16)	17.1-28.1	2.1-0.7	33-52	27-202	107-161	1.8-1.8	5.4-1.9	83-80	high	low
Netherlands	1996-2007 (#12)	22.1-35.0	2.9-2.0	63-73	70-351	210-222	3.1-3.1	2.4-1.2	85-82	high	high
Norway	1996-2007 (#12)	29.2-47.5	5.1-2.7	81-79	293-598	518-752	2.3-2.3	3.5-2.9	72-72	high	high
Poland	2001, 2003, 2005 (#3)	9.6-11.7	4.5-3.9	80-85	21-29	86-107	2.1-2.1	0.8-1.3	43-40	low	low
Portugal	1992, 1996, 2004-2005 (#4)	11.0-18.8	7.9- -0.8	20-27	10-151	67-129	4.8-4.3	3.4-3.0	79-69	medium	high
Slovakia	2000-2007 (#8)	10.7-16.0	4.4-6.5	84-89	8-64	207-273	2.5-2.3	1.1-0.4	48-36	high	high
Spain	1992-2007 (#16)	14.2-27.3	3.8-3.6	24-50	11-189	32-122	3.9-2.5	3.8-3.5	76-81	medium	high
Sweden	1995-2007 (#13)	18.6-32.7	-2.1-3.3	74-85	415-555	453-498	2.9-2.9	2.1-1.6	89-92	medium	high
UK	1992-2007 not 1998 (#15)	16.8-32.1	0.8-2.2	49-73	64-315	250-709	1.0-1.1	0.3-0.4	54-35	low	low
<b>TOTAL</b>	<b>205 cases</b>										

Notes: (a) The years 1997-2000 are missing for Poland as we cannot differentiate self-employment from dependent employment. For Hungary the year 1996 was excluded as it lacks information on contract type. For Ireland we lack information on collective bargaining coverage (CBC), for Slovenia we lack information of public spending, which is why we could not include these two countries in our analyses. CBC lagged by two years is furthermore missing for 12 country-years in PT, 6 country-years in CZ and HU, 4 country-years in EL and PL, and 2 country-years in SK. Finally, we lack information on public spending on families for another country-year in Hungary. Overall, this amounts to a sample size of 205 country-years in 18 countries. (b) The values for the macro-level predictors refer to the year that precedes the start and end dates of the country-specific observation windows, because we look at their effect when lagged by two years. For example, we show the values of GDP per capita for the years 1993 and 2005 for Austria. (c) The values shown here refer to the degree of regulation on a scale from 0-6 with higher values representing stronger regulation, i.e. greater regulation of regular employment in the case of EPL and more legal restrictions on temporary work in the case of TEMP. The regression models test the effect of de-regulation of TEMP, however, (i.e. the inverse of the regulation measure).

**Table A2: Overview of level-2 regressors**

*Gross domestic product per capita (GDP)*: Source: The World Economic Outlook (WEO) database, available from [www.imf.org](http://www.imf.org), Definition: gross domestic product based on purchasing-power-parity (PPP), per capita, (unit: current international dollar). (WEO Subject Code: PPPPC).

*Annual change in GDP per capita*: Source: The World Economic Outlook (WEO) database, available from [www.imf.org](http://www.imf.org), Definition: percentage change of GDP per capita on previous year, constant prize GDP (WEO Subject Code: NGDP\_RPCH).

*Skill supply*: Source: Eurostat, available from <http://epp.eurostat.ec.europa.eu> (extracted 3 January 2010), Definition: % of the population aged 25-64 having completed at least upper secondary education (Eurostat subject code *edat\_lfse\_08*).

*Public spending on families*: Source: OECD Social Expenditure Database (SOXC). Definition: Total public expenditure on social protection area 'family' (branch=5). Unit: per head, at current prices and current PPs, in 100 US dollars. This includes public expenditure which supports families (i.e. excluding one-person households). It covers expenditure on child/family allowances and credits, childcare support (including daycare), income support during leave and sole parent payments. We use separate estimates of spending in cash and in kind.

*Employment protection (EPL)*: Source: OECD, subject code: *EPR\_v1*. Definition: indicator for dismissal of employees on regular contracts, quantifying the costs and procedures involved in dismissing individuals or groups of workers ('firing costs'); annual data, scale from 1-weak/no regulation to 6-strict regulation. For the analyses, the continuous variable is used to estimate the main effect of EPR. Additionally, the variable is dichotomized (high versus low EPL, the latter referring to values lower than 2.17, which is the case for 6 countries: Belgium, Denmark, Hungary, Italy, Poland, and UK). This dummy measure of EPL is time-invariant at country-level and allows for better interpretation of its interaction with the deregulation of temporary work.

*Deregulation of temporary work (TEMP)*: Source: OECD, subject code *EPT\_v1*. Definition: strictness of regulation of fixed-term contracts (i.e. valid cases for use of fixed term contracts, maximum number of successive fixed-term contracts, maximum cumulated duration of successive fixed-term contracts) and of temporary work agency employment (i.e. types of work for which agency work is legal, restrictions on number of renewals of temporary work agency contracts, maximum cumulated duration of successive temporary work agency contracts). The original scale from 1-weak regulation to 6-strict regulation is reversed to measure de-regulation. The variable is mean-centralized around its mean.

*Collective bargaining coverage (CBC)*: Source: ICTWSS database by Visser (2009). Definition: employees covered by wage bargaining agreements as a % of all wage and salary earners in employment with the right to bargaining, adjusted for the possibility that some sectors or occupations are excluded from the right to bargain (ICTWSS subject code: *AdjCov*). This indicator is measured annually. Divided by 10, values range from 0-10. Values have been imputed in cases where the database provides values for odd years, while the in-between value is missing (e.g. in Hungary we observe the same value for 2003 and 2005 but have a missing value for 2004; in Greece we observe a constant value of 80 in 1990, 1993, 1995 and 1998, while the years in-between have missing values). Based on the assumption that we observe an underlying time-invariant time-series during these periods, the missing values are replaced by the constant value. Values for eight country-years are added by this procedure (2005 for CZ, 2004 for HU, 1991, 1992, 1994, 1996, 1997, 2004 for EL).

*Coordination of wage setting (COORD)*: Source: ICTWSS database compiled by Visser (2009). Definition: The variable reflects a 5-point classification of wage-setting coordination distinguishing between 1) economy-wide bargaining, 2) mixed industry and economy-wide bargaining, 3) industry bargaining, 4) mixed industry-level and firm-level bargaining, and 5) fragmented bargaining, mostly at company level (ICTWSS subject code: *WCoord*). Among the 217 cases (country-years) covered in the model, the time-varying distribution among the 5 categories is: 8.3%, 11.5%, 19.4%, 54.4%, 6.5%. The variable is collapsed to create a 3-category variable, by collapsing categories 1&2 (high) as well as 4&5 (low). For the analysis, a time-invariant measure is created. In the majority of cases, the allocation of countries to the three categories is straightforward, as they stay within one of the tree categories in the entire observation period (high in AT, BE, DE, EL, NL, SK, low in CZ, FR, HU, PL, UK). For the remaining 7 countries, the category into which most of the yearly values fall is used (DK, SE, ES and PT are allocated to the medium category and FI, IT and NO to the high coordination category), while those yearly values that fall outside this 'time-invariant category' are set to missing (the missing category is included as a separate dummy in the analysis interacted with CBC).

**Table A3. Correlation matrix: macro-level variables**

	Protection of regular contracts	Deregulation of temporary work	Collective bargaining coverage	Spending on families-cash	Spending on families-kind	GDP	GDP change
Protection of regular contracts	1.00						
Deregulation of temporary work	-0.09	1.00					
Collective bargaining coverage	0.27	-0.51	1.00				
Spending on families-cash	-0.23	0.35	0.17	1.00			
Spending on families-kind	-0.15	0.23	0.17	0.55	1.00		
GDP	-0.09	0.13	0.28	0.66	0.66	1.00	
GDPchange	0.05	0.15	-0.15	0.03	0.02	-0.02	1.00
Skill stock	-0.07	0.59	-0.20	0.61	0.53	0.40	0.14