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# Labor Market Institutions, the Insider/Outsider Divide and Social Inequality in Employment in Affluent Countries

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# Labor Market Institutions, the Insider/Outsider Divide, and Social Inequalities in Employment in Affluent Countries


## Abstract

This article investigates the role of labor market institutions for social inequalities in employment. To distinguish institutional impacts for men and women, age groups, and educational levels the analysis draws on data from 21 countries using the European Union Labour Force Survey and the Current Population Survey 1992-2012. The analysis demonstrates that there is significant heterogeneity in the relationship between institutions and employment across social groups. In line with the literature on dualization, institutions that arguably protect labor market insiders, i.e. employment protection, unionization, and unemployment benefits, are frequently associated with greater inequality between typically disadvantaged groups and their insider peers. By contrast, institutions that discriminate less between insiders and outsiders, i.e. active labor market policies, minimum income benefits, and centralized wage bargaining at times boost social equality on the labor market. The insider/outsider argument provides a valuable heuristic for assessing heterogeneity in institutional impacts, yet in several instances the results deviate from the expectations.



*SER Keywords*: employment, inequality, labor market institutions

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Being jobless is a major cause of economic and social deprivation, as employment is a source of economic security as well as an integral factor in facilitating social inclusion and well-being (Gallie et al., 2003; Jahoda et al., 1975). At the societal level, joblessness undermines social cohesion and requires public resources to support jobless individuals. These issues become even more salient when joblessness is distributed unequally across social groups. Women, labor market entrants, and individuals with low education are at a particular risk of experiencing disadvantages on the labor market. For instance, in 2007 27% of 15 to 29 year olds who had already left education were without a job in the United States compared to 19% among the 30 to 54 year olds. In the same year, Spain had an already high jobless rate of above 30% among all working aged, but women were disadvantaged with almost 42% joblessness. Sweden, despite being one of the best performing countries with only around 16% joblessness, nevertheless carried a jobless rate of 29% among the low-educated.[1]

To explain the large cross-national variation in joblessness, researchers have devoted considerable attention to the combined impact of institutions that regulate the labor market, such as employment protection legislation (EPL), unionization, and wage bargaining centralization, as well as welfare state policies, such as benefits for the jobless and active labor market policies (ALMPs). The labor markets in the United States and Europe in the 1980s and 1990s led many to see institutions as sources of labor market rigidity (Layard et al., 2005; Nickell, 1997; Siebert, 1997). According to this view, institutions obstruct the efficiency of the labor market by inducing friction into an otherwise well-oiled machine. By contrast, at the end of the 1990s, the success of the comparatively regulated Scandinavian

[1] All figures are based on calculations made by the author using the European Union Labour Force Survey (EULFS) and the Current Population Survey (CPS). The sample consists of the entire working age population (15-64) but excludes those who are both under 30 and still in education (see data section below).

countries led to a literature highlighting the potential benefits of institutions (e.g. Estevez-Abe et al., 2001; Iversen, 2005). Scholars argue that the social investment state increases skill levels via ALMPs and produces better job matches via generous benefits (Gangl, 2004, 2006; Nelson and Stephens, 2012). Altogether, however, the empirical evidence for the hypothesis that institutions strongly affect overall employment levels – be it positive or negative – is decidedly mixed (Avdagic and Salardi, 2013; Baccaro and Rei, 2007; Baker et al., 2005). That does not mean that institutional contexts are inconsequential for labor markets. One important thread to follow in disentangling institutional impact is how institutions shape the social distribution of jobs. There is broad support for institutions affecting the labor market performance of specific social groups (Esping-Andersen and Regini, 2000). Typically, studies focus on one particular disadvantaged social group and analyze the effect of a specific institutional arrangement on the labor market performance of that group. For instance, strict EPL has consistently been associated with high joblessness among labor market entrants (e.g. Barbieri, 2009; Breen, 2005; Gebel and Giesecke, 2016).

This study tends to a need to examine the heterogeneity in institutional impacts across social groups (e.g. Brady et al., 2010; DiPrete et al., 2006; DiPrete et al., 2001). Its major aim is to investigate whether there is a more general pattern connecting labor market institutions and employment inequality. Traditionally, neither the literature portraying institutions as labor market rigidities nor the literature emphasizing beneficial institutional effects have paid a lot of attention to heterogeneity in the effects of institutions on employment. Instead, this study draws on a growing body of literature on the rising dualization between labor market insiders and outsiders (Emmenegger et al., 2012; King and Rueda, 2008; Palier and Thelen, 2010). The main argument is that institutions such as EPL, corporatist wage bargaining, or selective welfare benefits disproportionally benefit so-called insiders, i.e. individuals that spend their careers consistently at the core of the labor market. This inadvertently

marginalizes outsiders, i.e. individuals who are more vulnerable to atypical work and unemployment, which increases the inequality in chances to enter secure employment (Biegert, 2014; Fervers and Schwander, 2015). The insider/outsider divide determines the degree of social inequality in employment because women, labor market entrants, and the low educated are considered typical outsiders. To combat the growing divide between insiders and outsiders, the dualization literature recommends social investment strategies, which entail ALMPs and generous universal benefits such as minimum income benefits.

The article's main contribution to the literature is to test these considerations empirically by analyzing social heterogeneity in the impacts of labor market regulation and welfare state policies. In addition, it advances the literature analytically and adds to recent research that approaches the questions of institutions, insiders and outsiders, and the employment of disadvantaged social groups with more analytical rigor (Biegert, 2014; Fervers and Schwander, 2015; Giesselmann, 2014; Schwander and Häusermann, 2013). I use individual level data from 20 European countries in the European Union Labour Force Survey (EULFS) and data on the United States from the Current Population Survey (CPS) (Flood et al., 2015) for the time period 1992 to 2012 and combine them with country-level time series indicators for institutional arrangements. In contrast to many existing studies on institutions and employment, the data enables me to leave the macro-level, model the proposed macro-micro relationships, and assess heterogeneity in institutional impacts (Adriaenssens and Hendrickx, 2015). I use the longitudinal macro-micro data structure in two-way fixed effects models with fixed effects on the level of country-specific social groups. This enables me to account for omitted variable bias stemming from time-constant unobserved heterogeneity on the meso-level of social groups, which is frequently an issue in cross-sectional multilevel models.

## Theoretical Background

The study investigates whether there is a general pattern connecting the institutional context of labor markets and the distribution of employment across social groups. This section will discuss in a first step the arguments of the literature on labor market insiders and outsiders. I will then relate the concepts of insiders and outsiders to socio-demographic groups, pointing to the typical outsider position of women, labor market entrants, and low educated individuals. Finally, I will discuss how institutions shape the insider/outsider divide. This will include institutional arrangements at the base of dualization processes, i.e. EPL, unionization, wage bargaining centralization, and unemployment benefits. Additionally, I will discuss how social investment policies, i.e. ALMPs and minimum income benefits, might help decrease the insider/outsider divide.[2]

### *Insiders, Outsiders, and Labor Market Dualization*

With the rising social inequality throughout the industrialized world, there has been a renewed interest in the notion of labor market insiders and outsiders. Most prominently, scholars describe a process of labor market dualization (Emmenegger et al., 2012; Palier and Thelen, 2010; Rueda, 2005, 2014). Their arguments take up and extend insights from segmented labor market theory and especially insider/outsider theory (Doeringer and Piore, 1971; Lindbeck and Snower, 1988). The insider/outsider theory explains economic inequality and unemployment based on the assumption that insiders are in a powerful bargaining position because the replacement of workers implies transaction costs for employers. Insiders

[2] The study does not include institutional arrangements that are specifically related to the labor market performance of single social groups. Most visible examples for such relationships perhaps are family policies and childcare provision regarding the employment of women (Gornick et al., 1997) and the role of the educational system for transitions into employment of labor market entrants and those with lower education (Shavit and Müller, 1998). The empirical analysis accounts for these potential confounders, but the focus of the article is whether inequality is contingent on the base setup of the labor market.

can use the resulting asymmetry to raise their wages. Existing unemployment therefore does not push wages downward and outsiders remain without a job (Lindbeck and Snower, 1988).

The dualization literature argues that insiders use this bargaining position to influence politics and to entrench their positions. They may do so in a variety of ways, for instance through cross-class coalitions with employers, union representation, or social democratic parties (Davidsson and Emmenegger, 2013; Rueda, 2005, 2014). One prime example for insider driven dualization processes is the deregulation of EPL at the margins of the labor market while jobs at the core of the labor market remain as protected as ever, for instance in countries such as Germany or France (Eichhorst and Marx, 2011; Marx, 2012; Palier and Thelen, 2010). The entrenchment of insiders is detrimental to labor market inclusion because it increases the inequality in terms of economic gains and security and at the same time raises the barrier to entering insider positions (Biegert, 2014; Fervers and Schwander, 2015). The insider/outsider divide thus increases inequality and stabilizes it, which in conjunction with political influence of insiders might result in institutional feedback loops.

*Insiders, Outsiders, and Socio-demographic Groups*

The insider/outsider divide is highly relevant for questions of social inequality because social groups differ in their likelihood to be insiders or outsiders. There are various definitions of insiders and outsiders in the literature. Early iterations of insider/outsider theory use a snapshot perspective of the labor market to define who is an insider and who is an outsider. Individuals in employment are considered insiders and individuals without employment are considered outsiders (Lindbeck and Snower, 1988). Expanding beyond the snapshot definition, several contributions to the dualization literature take a life-course perspective (Schwander and Häusermann, 2013). Outsiders are understood as individuals who over their career are more likely to find themselves without employment and in precarious work situations. Following the logic of insider/outsider theory, the present labor

market position of individuals is central to subsequent trajectories.[3] Because some social groups are more likely to find themselves in outsider positions at certain stages in their lives, they are more likely to suffer the disadvantages suggested by the insider/outsider logic. Although this study focuses on the distribution of employment at a given point, it is sensible to follow the life-course approach and to understand cross-sections as the outcome of longitudinal labor market processes that differ across social groups.

An argument can be made that some of the consequential divides in the labor market are along the lines of sex, age, and education. Accordingly, the dualization literature identifies women, labor market entrants, and the low-educated as typical outsiders (Biegert, 2014; Emmenegger et al., 2012; Fervers and Schwander, 2015; Schwander and Häusermann, 2013)[4]. Most important to the insider/outsider argument is that these groups find themselves more frequently in outsider positions from where they face a barrier to the inside. Women experience more labor market transitions because of motherhood, other care responsibilities, and – at least in older cohorts - lower attachment to the labor market (e.g. Buchholz et al., 2009; Drbonič et al., 1999). Labor market entrants start from an outsider position. In competing with prime-aged and older workers their little work experience adds another disadvantage (e.g. Breen, 2005; Gebel and Giesecke, 2016). Individuals with low education typically work in low wage sectors and positions with insecure prospects. These segments show career paths that are often disrupted by joblessness (e.g. Abrassart, 2015). Altogether,

[3] Current positions could even be considered to rival productivity in terms of importance for future career trajectories. For instance, older workers, which are often regarded to be less productive due to deprecating human capital, are not seen as typical outsiders, simply because they usually are in an established position.

[4] This does not save individuals in other groups from potential outsider status. For instance, there is an increasing number of high-skilled individuals with high levels of labor market vulnerability (Häusermann et al., 2015). Still, within these broad categories, women, labor market entrants, and the low-educated should bear the highest risks.

women, labor market entrants, and the low educated should be most disadvantaged by a strong insider/outsider divide.

*Labor Market Institutions and the Insider/Outsider Divide*

The bargaining position of insiders is advantageous in every economy. However, the literature discusses several institutional arrangements that raise insider bargaining power, secure their positions, and thus might worsen labor market inequality (Lindbeck and Snower, 1989). More specifically, the insider/outsider divide could be entrenched by labor market regulation (EPL, unionization, and wage bargaining centralization) and welfare state provisions (unemployment benefits) (Emmenegger et al., 2012; Esping-Andersen and Regini, 2000; Palier and Thelen, 2010; Thelen, 2014).

EPL affects the flow in and out of the labor market by determining the difficulty of hiring and firing employees. Strict EPL thus stabilizes the positions of insiders (Barbieri, 2009; Breen, 2005; Gebel and Giesecke, 2016). Without additional job growth, outsiders will face lower chances of employment. Furthermore, when strict EPL impedes shedding labor in economic downturns, employers might generally hesitate to offer insider positions to outsiders. They might prefer employing them on temporary contracts which might lead back into joblessness (Barbieri and Cutuli, 2016; Bentolila et al., 2012).

Corporatist wage bargaining might lead to improved outcomes for insiders and a larger insider/outsider divide through two channels. First, a large membership gives unions more bargaining power, which results in better working conditions and higher wages (Freeman and Medoff, 1984; Rueda and Pontusson, 2000). But, because their membership mostly consists of employed people unions are often portrayed as representing insider interests (Bertola et al., 2007; Davidsson and Emmenegger, 2013; Lindbeck and Snower, 1989). In addition, higher wages and secure positions for the employed might leave employers more selective in the hiring process. If so, strong unions will be associated with a

larger insider/outsider divide. Second, wage bargaining systems differ in the degree to which the bargaining process is centralized. Centralization encompasses the level at which bargaining takes place and the degree to which unions are able to coordinate their goals (Calmfors and Driffill, 1988; Iversen, 1999). Centralized bargaining might help unions reach better outcomes for their members, which, again, could come at the detriment of outsiders (Palier and Thelen, 2010; Rueda, 2005).

In addition to labor market regulation, the welfare state might entrench the insider/outsider divide, specifically through generous unemployment insurance (Häusermann and Schwander, 2012; Seeleib-Kaiser et al., 2012). Eligibility for unemployment insurance usually has to be earned with social security contributions. Insiders are more likely to be eligible for unemployment benefits due to their consistent labor market participation. They can use the added economic security in bargaining and increase their wages, which widens the insider/outsider divide. Furthermore, in case of job-loss generous unemployment insurance provides a comfortable position to wait for good job matches, leading back to insider positions (Gangl, 2004, 2006). According to this view, we would expect better employment outcomes for those eligible for unemployment benefits. This is in stark contrast to orthodox economics. In the orthodox view generous unemployment benefits should disincentivize insiders against working, resulting in a more narrow employment gap between insiders and outsiders (Layard et al., 2005; Siebert, 1997).

So far, the main thrust of the argument is that institutions that raise the bargaining power of the core workforce increase the insider/outsider divide. This increases inequality in employment between outsiders such as women, labor market entrants, and the low educated and their insider counterparts. Deregulation and welfare state retrenchment seem to be the implied panacea - surprisingly close to orthodox economics and earlier formulations of the insider/outsider theory (e.g. Layard et al., 2005; Lindbeck and Snower, 1989; Siebert, 1997).

However, the dualization literature does not consider institutions problematic in principle, but only to the extent that they create structural inequality. There might be ways to regulate the labor market and provide economic security that do not entrench insider positions and even decrease the insider/outsider divide. Most importantly, corporatist wage bargaining might create a more inclusive labor market (Thelen, 2014). The comparative labor market literature has often endorsed the notion that centralized wage bargaining leads to wage moderation (Western, 1998; Kenworthy, 2002; Ebbinghaus and Kittel, 2005). Unions are willing to constrain their demands in a centralized system. Because they cannot externalize detrimental effects of high wages on the economy, they opt for employment friendly wage agreements, which raise outsiders' chances to find a job (Calmfors and Driffill, 1988; Western, 1998). Within the dualization literature these arguments have been used to explain the relatively narrow insider/outsider divide in Scandinavian countries (Häusermann and Schwander, 2012; Schwander and Häusermann, 2013; Thelen, 2014). Additionally, recent research argues that strong unions might follow an inclusive approach and represent outsiders under certain circumstances (Benassi and Vlandas, 2016). If so, they might mediate the insider/outsider divide instead of widening it (Fervers and Schwander, 2015).

Furthermore, scholars recommend social investment policies to contain dualization rather than deregulation (Emmenegger et al., 2012; Morel et al., 2012). Social investment policies promote the employability of jobseekers. They usually take the form of ALMPs and generous benefits that allow the accumulation of human capital and improve job search outcomes. As argued above, generous unemployment benefits might increase the insider/outsider divide because they are available to only a restricted part of the population (Seeleib-Kaiser et al., 2012). However, the welfare state can provide benefits to the jobless without directly affecting the relative bargaining positions of insider and outsiders. Most importantly, minimum income benefits are usually provided independent of previous

contributions and thus in principal available to anyone. Like unemployment benefits, however, generous minimum income benefits should relieve the pressure to take bad jobs and enable participation in training programs (Gangl, 2004, 2006). Hence, they might lead to better outcomes for jobseekers independent from their employment history. By contrast, orthodox economics would expect negative employment effects for outsiders because disincentives should affect those with lower wage expectations the most (Layard et al., 2005; Siebert, 1997). ALMPs ease transitions and boost the employability of jobless individuals by increasing their human capital, assisting the search process, and subsidizing labor costs (Bonoli, 2010). These policies are frequently tailored to help women, labor market entrants, and the low educated into the labor market (Armingeon and Bonoli, 2006). If effective, spending on ALMPs should reduce employment inequality between typical insiders and outsiders.

**Data & Variables**

The study uses cross-sectional individual level data from the EULFS and the CPS. Pooling national labor force surveys of all EU members and further European countries since 1983 the EULFS stands out as the only data source that offers rich information on individuals and their working life from a large number of European countries and for a long period of time. The IPUMS-CPS provides comparable data from the CPS starting from 1962 (Flood et al., 2015). Because I use only very basic socio-demographic information, the US data is a comparable to the European dataset (for other work combing the two datasets see Hipp and Leuze, 2015)[5]. Using data from 1992 to 2012 from 20 European countries and the US, the international comparison offers widespread institutional variation in addition to variation over

[5] To assess whether the inclusion of the US data biases the results I ran robustness checks excluding the US. The robustness checks did not reveal substantively different results (see Table OS2 and Figures OS5 to OS7 in the Online Supplement).

the observed period.[6] Due to missing information in some cases, the dataset spans a total of 351 country-years.[7] The analysis includes all individuals of working age (15-64) except those below 30 who are still in education. Due to country size and different modes of data delivery, the sample sizes in the original dataset differ widely. For instance, the data for Denmark in 2004 encompass 8,900 observations whereas the German sample in 1997 consists of 290,000 observations. To give equal weight to every observed institutional constellation I draw random samples of 8,500 individuals from each country-year. This also reduces the sample to a manageable size for computing. The balanced dataset includes 2,983,500 individuals.

*Dependent Variable*

The dependent variable is *EMPLOYMENT* (coded employed (1) and jobless (0)). Both the EULFS and the CPS follow the ILO definition, meaning everyone who worked at least one hour in the week before the interview is considered employed. Analyzing employment means including the entire working age population, i.e. the employed, the unemployed, and the inactive. Inactivity is defined as not having a job and – in contrast to unemployment – not having actively searched for one in the past four weeks. There are several reasons for analyzing employment and including the inactive instead of analyzing the more frequently used unemployment, especially when the goal is to assess the social inclusiveness of labor

[6] There are six Eastern European countries in the sample. They might differ systematically from the Western countries. Table OS3 and Figures OS8 to OS10 in the Online Supplement show robustness checks run without the Eastern European countries. They show slight differences but generally confirm the patterns found in the main models.

[7] Availability of micro-level and macro-level data determined the choice of countries and periods covered. The countries are Austria (AT, 1995-2012), Belgium (BE, 1992-2012), Switzerland (CH, 1996-2012), Czech Republic (CZ, 1998-2012), Germany (DE, 1992-2012), Denmark (DK. 1992-2012), Estonia (EE, 2005-2012), Spain (ES, 1992-2012), Finland (FI, 1995-2012), France (FR, 1993-2012), Hungary (HU, 2000-2012), Ireland (IE, 1992-1997, 1999-2009), Netherlands (NL, 1996-2012), Norway (NO, 1996-2012), Poland (PL, 2001-2011), Portugal (PT, 1997-2012), Sweden (SE, 1995-2012), Slovenia (SI, 2005-2012), Slovakia (1999-2012), United Kingdom (UK, 1992-1997, 1999-2012), and the United States (US, 1992-2012).

markets. First, research has shown that omitting the inactive population means missing a significant proportion of transitions and dynamics on and off the labor market (Murphy and Topel, 1997). Second, there is evidence that some institutional changes have a bigger impact on inactivity than on unemployment (Amable et al., 2010). Finally, as the focus of the analysis is the impact of institutional arrangements on the employment of typical outsider groups compared to insiders, there might be selection bias when focusing on the labor force. Typical outsiders are more prone to spending periods out the labor force (e.g. due to household responsibilities or education). By contrast, the labor force is a socially selective group generally closely attached to the labor market. As this selection process might be related to the institutional setting of the labor market, the institutional impact on social differences in employment might be underestimated when focusing on unemployment.[8]

*Independent Variables*

The analysis focuses on social differences on three dimensions: sex, age, and education. *SEX* is a dummy variable, coded (0) for men and (1) for women. Three dummy variables distinguish *AGE GROUPS* of labor market entrants (15-29), the prime-aged (30-54) and older individuals (55-64). *EDUCATION* follows the 1997 version of the International Standard Classification of Education (ISCED) distinguishing three different levels: ISCED0-2 includes lower secondary education or less, ISCED3-4 upper secondary and post-secondary

[8] Because the focus of this article is on the inclusiveness of the labor market it analyzes the whole working age population. Yet, there are individuals among the inactive who are not available for work regardless of the institutional setting. Therefore, I also run sensitivity analysis using a sample that excludes the inactive (see Appendix). Results differ in several instances from the models on the whole working population. Frequently, differences between social groups are smaller or insignificant, which indicates that the omission of the inactive leads to an underestimation of the impact of institutions on social inequality. Yet, there are instances in which the differences are even larger. These findings warrant further investigation.

education, and ISCED5-6 tertiary education. I introduce them as dummy variables labeled low education, medium education, and high education.[9]

Several other individual level variables could confound the relationships of interest, such as household background, occupation, or class. Information on household composition has many gaps and is not available for some countries. Therefore, I use three categories of *MARITAL STATUS* (single, married, and widowed/divorced/separated) as a proxy to adjust for household background. Information on occupation and other work-related variables is only available for those currently holding a job, which is why they cannot be included. Characteristics such as occupation and class are usually considered rather stable so the fixed effects should absorb them at least partly (see Methods). Nevertheless, it cannot be excluded that omitted time-varying variables bias the estimates.

I model institutional arrangements with indicators that vary by country and year. The OECD's *EPL* index quantifies the costs and procedures involved in individual or collective dismissal on a range from 0 to 6 (Venn, 2009). *UNIONIZATION*, also provided by the OECD, indicates the organizational power of unions as the percentage of salary and wage earners who are union members. To measure wage bargaining *CENTRALIZATION* I use an indicator developed by Iversen (1999) and extended by Visser (2013). The indicator measures the degree of coordination and centralization, combining level of bargaining and union concentration at the respective levels (range 0 to 1).

I measure *UNEMPLOYMENT BENEFIT* generosity with net replacement rates. They represent the percentage of the former income an average production worker receives from unemployment insurance after taxes and social security contributions. Van Vliet and Caminada (2012) provide an indicator that focuses on the replacement rate in the initial phase

[9] Migration background is another interesting individual level variable, especially because migrants are often considered typical outsiders, too. However, information on migration background shows many missings in the dataset, which prohibits the analysis of this variable.

of unemployment, averaging net replacement rates for singles and one-earner families with two children. Nelson (2010) collects absolute amounts of *MINIMUM INCOME BENEFITS*. The main component is social assistance payments. Housing supplements, child support, and other benefits are added as long as they are not deducted from social assistance. I us the absolute numbers to construct a ratio that compares payments to the average wage in the respective year and country. The extent to which a country invests in *ALMPs* is measured by expenditures relative to the GDP (Source: OECD). To approximate the amounts spent on unemployed individuals, I divide figures for spending on ALMPs by the unemployment rate. Table 1 provides an overview of the institutional indicators' mean and standard deviation by country. The total standard deviation is used to calculate standardized coefficients.

*<Insert Table 1 here>*

Based on previous findings, the analysis includes a number of macro-level control variables. Labor taxes (income tax and social security contributions) elevate labor costs and lower net earnings by driving a wedge between what employers pay and what employees receive. The OECD calculates the *LABOR TAX WEDGE* for a single-earner couple with two children and an average income. *CHILDCARE* policies affect labor market opportunities of women in particular. The amount to which a state provides public childcare opportunities is measured by the total public expenditure on childcare as a percentage of the GDP (Source: OECD). An important dimension of the wage bargaining process is how many workers its outcome actually covers. I use Visser's (2013) adjusted *COVERAGE* indicator to model the percentage of workers covered by wage bargaining agreements.[10] Additionally, the dataset contains the OECD's *OUTPUT GAP*. It measures the distance between the predicted GDP

[10] There are gaps in the time series for coverage. In order not to lose observations, I interpolate the data. Dropping coverage from the analysis does not substantively change the results.

trend based on previous years and the actual outcome and thus indicates a de-trended change in a country's economic performance.

**Methods**

The focus of the analysis is the heterogeneity in institutional impacts on the employment of social groups. Research on institutional impacts frequently pools time series of country-level institutional indicators and correlates them with the aggregate (un-)employment rate (e.g. Layard et al., 2005; Siebert, 1997). The time series allow for the use of country fixed effects, which accounts for time-constant unobserved heterogeneity (Allison, 2009). Pooled time series models are usually estimated at the macro-level and cannot address effect heterogeneity within countries. I use the multilevel data structure provided by the EULFS and CPS and the institutional indicators on the country-level for a pooled times series approach with two-way fixed effects on the level of country-specific social groups. This technique enables the assessment of heterogeneous effects while at the same time keeping the advantages of the fixed effects approach.

Employment is measured as a binary variable. I use linear probability models (see Wooldridge, 2002; Angrist and Pischke, 2008) expressed in the following functional form:[11]

$$\mathrm{Y}_{ijt} = C_0 + \beta_I I_{ij} + \beta_J J_{jt} + \beta_I I_{ij} * \beta_J J_{jt} + \beta_T T_t$$

$$+\beta_M M_{jt} + \beta_I I_{ij} * \beta_M M_{jt} + \varepsilon_{ijt}$$

[11] I use linear probability models instead of logistic regression for three reasons: First, in contrast to logistic regression, in which coefficients have to be transformed because of non-linearity, the interpretation of the coefficients from linear probability models is far more straightforward. Second, the main goal of the analysis is to compare the impact of institutions across different socio-demographic groups. The comparison of coefficients in logistic regression models across groups is problematic as the results might be biased by systematic differences in the residuals (Allison, 1999). Third, I want to test whether the differences in institutional impacts between groups are statistically significant. In logistic regression, neither statistical significance level of interaction terms nor their general direction can be taken for face value (Ai and Norton, 2003). Figure OS1 in the Online Supplement compares the results of the linear probability model to average marginal effects from the logistic regression of the baseline model. There are no substantive differences between the two specifications.

where the left hand side of the equation expresses the linear probability that individual *i* in country *j* and year *t* is employed. On the right hand side, $C_0$ is the intercept. $\beta_I I_{ij}$ represents the individual level characteristics (sex, age group, educational level, as well as marital status). $\beta_J J_{jt}$ signifies the country dummies. The repeated cross-sectional data of the EULFS and CPS allow me to introduce fixed effects on the aggregate level of social groups. Specifically, I compose groups according to their resident country, sex, age, and educational level. Imagine, for instance, a group consisting of all French women between 30 and 54 with high education. Introducing dummy variables for each of these groups fixes their mean value and thus eliminates all group-specific time-constant heterogeneity (Allison, 2009). The 378 dummies (21 countries * 2 sexes * 3 age groups * 3 education levels) are represented by $\beta_I I_{ij} * \beta_J J_{jt}$. The models adjust for all (relatively) time-constant factors on the level of these sex-, education-, and age groups within countries, among them such factors as occupational composition or class as well as country-level confounders such as educational systems. Wave dummies $\beta_T T_t$ adjust for period effects such as world economic downturns. Thus, these are two-way fixed effects models with fixed effects for the country-specific sex, age, and education groups.

The macro-level indicators are included via $\beta_M M_{jt}$ (EPL, unionization, wage bargaining centralization, unemployment benefits, minimum income benefits, ALMPs as well as labor taxes, childcare expenditure, bargaining coverage, and the economic output gap) [12]. To account for the argument that institutional change needs time to show effects and to deal

[12] To assess whether the results might be biased by multicollinearity I used post-estimation tools on the baseline macro-level model (using the aggregated employment rate as dependent variable) to calculate the variance inflation factor (VIF). Multicollinearity should not be an issue as there is no VIF higher than 5.

with potential reverse causality I introduce all institutional indicators as one year lagged variables.[13]

The baseline model includes all the aforementioned covariates. The central focus of the subsequent models is the interaction between the institutional variables and the socio-demographic groups. This interaction is expressed by $\beta_I I_{ij} * \beta_M M_{jt}$ where $M_{jt}$ specifies the institution and $I_{ij}$ the socio-demographic characteristic - sex, age, or education. I run three models including all interactions between institutions and the respective individual level variable of interest.

Finally, $\varepsilon_{ijt}$ is the idiosyncratic error term. Models cluster data in country-years to calculate robust standard errors that are corrected for within-group correlation, which also addresses the inherent heteroscedasticity issue in linear probability models (Angrist and Pischke, 2008).[14] Because countries are observed multiple times, there might be serial correlation. To deal with this, pooled time series models often include a lagged dependent variable. The data at hand does not offer this possibility because there is no panel information for the dependent variable. The models include the lagged aggregated employment rate to approximate this approach. This way I also avoid bias that can arise from combining fixed effects with the actual lagged dependent variable (Nickell, 1981).

**Results**

I present the results in two steps. First, I report results from the baseline model that estimates the associations of institutions with overall employment. Second, sections on men

[13] A robustness check using contemporaneous variables did not yield substantively different results; see Table OS1 and Figures OS2 to OS4 in the Online Supplement.

[14] Country-years are nested in countries. Individuals in one country but different years are likely to be more similar to each other than individuals in different countries. Using clustered standard errors for countries, however, is problematic because the number of cases (21) does not fulfill the asymptotical requirements for the calculation of robust standard errors (Kezdi, 2004). The fixed effect approach ensures that at least the time constant part of the issue of non-independent observations beyond the level of country-years is taken care of.

and women, age groups, and educational levels present the findings from the models that interact institutions with the socio-demographic groups.

*Institutions and Overall Employment*

Model 1 in Table 2 displays the baseline model for institutional impact on the total working age population. Due to the fixed effects approach the coefficients represent differences in individual employment probability within groups associated with changes in the institutional arrangements. The institutional indicators are standardized, thus a marginal change means increasing the variable by one standard deviation (see Table 1 for standard deviations). According to the model, a standard deviation increase in centralization is associated with a 1.9% decrease in employment. The coefficient of unionization (-2.1% per standard deviation) is significant on the 10%-level. Yet, most coefficients are not statistically significant. Thus, the models are in line with previous research that contests the impact of institutions on overall employment (Avdagic and Salardi, 2013; Baccaro and Rei, 2007; Baker et al., 2005). There is weak evidence at best for a homogeneous institutional impact on overall employment as proposed by the literature portraying institutions as labor market rigidities and the literature emphasizing beneficial institutional effects. However, as we will see in the following sections, non-significant effects on the aggregate level do not preclude institutional impacts on social inequality in employment.

*<Insert Table 2 here>*

*Institutions and Employment Differences between Men and Women*

Because the number of interaction terms in the models prohibits straightforward interpretation of the coefficients, I present the results for heterogeneous institutional impacts in graphical form. Figures 1 to 3 display the predicted coefficients and confidence intervals of EPL, unionization, wage bargaining centralization, unemployment benefits, minimum income

benefits, and ALMP for men and women (Figure 1), 15-29, 30-54, and 55-64 year olds (Figure 2), and low-, medium-, and high-educated individuals (Figure 3). Each figure, thus, summarizes the findings from one model (Table 2 shows the main coefficients and interaction terms from these three models). The group estimates are significantly different from each other if the confidence intervals of one group do not overlap with the point estimate of the group of comparison (Elwert and Christakis, 2006; see also the levels of statistical significance for the interaction terms in Table 2). The figures depict 95% confidence intervals. In Table 2 and the text I also point out coefficients significant on the 10%-level.

Figure 1 reveals that several institutional arrangements have a significantly different association with the employment of men and women. The association of EPL with the employment of men is positive (significant on the 10%-level). There is a significant negative difference between men and women (ref.: men, difference: -.029, $p<.01$). As a result, the association of EPL with the employment of women is negative (-1.2% per standard deviation, $p<.05$). Unionization shows a comparatively strong association, indicating a decrease in female employment by 4.8% for every standard deviation increase. There is no significant association with male employment as a result of a large significant interaction term (difference: -.055, $p<.001$). There is a significant difference between men and women for wage bargaining centralization (difference: .044, $p<.01$) showing in the opposite direction. In this case, the association is not significant for women but there is a significant negative association between centralization and the employment of men (-4.2% per standard deviation).

*<Insert Figure 1 here>*

Disaggregating the impact of labor market policies, we find differences between men and women as well. On the 10%-level unemployment benefits are associated with higher

employment of men while there is no correlation with the employment of women (the interaction term is negative and significant on the 10%-level). Minimum income benefits are negatively associated with the employment of men (1.3% per standard deviation). Yet, women's employment is positively associated with minimum income benefits on the 10%-level (difference: .020, p<.001). Finally, ALMPs are the only institutional arrangement where there is neither an association with the employment of men nor women nor a significant difference between them.

The overall pattern fits the theoretical expectations. EPL, unionization, and unemployment benefits arguably protect insiders and show significantly heterogeneous associations to the disadvantage of women. The findings for centralization show in the opposite direction and deliver evidence for arguments of wage moderation and outsider inclusion. Similarly, the results for minimum income benefits can be interpreted as confirming considerations about positive job search outcomes for outsiders. In both cases, however, greater equality seems to come at the cost of insider employment.

*Institutions and Employment Differences between Age Groups*

Figure 2 displays the results for the comparison of the three age groups. Surprisingly, there are no significant overall associations or interaction effects for EPL with any of the three age groups.[15] Unionization, however, shows a strong negative association with older workers. There is a 10.4% decrease in their employment associated with a one standard deviation increase in unionization. The difference to the prime-aged is large and statistically significant (difference: -.105, p<.001). Both the prime-aged and labor market entrants show no significant coefficient for unionization. Prime-aged men show a negative significant association with centralized wage bargaining processes (-2.4% per standard deviation). Labor

[15] The sensitivity analysis focusing on the labor force (see Appendix), however, confirms that EPL is associated with higher unemployment among labor market entrants, as reported by many other studies (e.g. Breen 2005, Gebel and Giesecke 2016).

market entrants and older workers show no significant association. The differences between the three groups are not significant either.

*<Insert Figure 2 here>*

Unemployment benefits show no significant associations with labor market entrants and the prime-aged but a positive significant association with older workers' employment. There is a significant positive difference between the prime-aged and older workers (-.014, $p<.01$). 55-64 year olds experience advantages in a context with higher unemployment benefits. There is no significant association between minimum income benefits and the three age groups. There is a small negative difference between prime-aged men and older workers (significant on the 10%-level). Finally, ALMPs are negatively associated with employment of the 55-64 year olds on the 10%-level (1.0% per standard deviation) marking a significant difference to the prime aged (-.014, $p<.01$). Still, there is no significant association of ALMPs with the prime-aged or labor market entrants.

In comparison to the results for men and women, the findings for the age groups deliver mixed support for the theoretical expectations. Similar to sex differences, centralization shows a negative association with the employment of insiders, i.e. the prime-aged, thus creating higher equality in employment at the population level. Similarly, ALMPs are not associated with higher employment of outsiders but with lower employment of typical insiders (in this case older workers) if anything. In general, the employment of older workers seems most strongly affected by institutional shifts. The standout finding here is the large negative association between unionization and older workers' employment, which contradicts expectations of the dualization literature. A potential explanation might be that strong unions are able to negotiate good conditions for early retirement (Ebbinghaus, 2006).

*Institutions and Employment Differences by Education*

Figure 3 shows the associations between institutions and the employment of individuals with different educational levels. EPL is not associated with the employment of the low- and the medium-educated yet shows a significant positive association with the employment of the high-educated (1.5% per standard deviation, $p<.05$). This association is also significantly different from the other groups (ref. medium-educated, difference .019, $p<.001$). Unionization shows a negative association with the medium-educated (-4.8% per standard deviation). There are large significant differences to the low- and the high-educated (.071, $p<001$ and .056, $p<.001$, respectively), resulting in a positive association between unionization and the low-educated (on the 10%-level) but no significant association with the high-educated. Reversely, the low- and the high-educated show significant negative associations with wage bargaining centralization (-2.3% per standard deviation, $p<.1$ and -2.6%, $p<.01$, respectively), whereas the medium-educated show no significant association. The difference between medium-educated and high-educated is significant (-.014, $p<.05$).

*<Insert Figure 3 here>*

Neither unemployment benefits nor minimum income benefits show a significant association with any of the educational levels. There are also no significant differences between them. Finally, ALMPs display a positive coefficient for the low educated (.7% per standard deviation, significant on the 10%-level), no significant association with the medium-educated, and a negative significant association with the employment of the high-educated (-0.8% per standard deviation, $p<.01$). The difference of 0.4% between the medium-educated and the low-educated is significant on the 10%-level. The difference between the high-educated and the medium-educated is significant as well (-.011, $p<.001$).

The findings for heterogeneous institutional effects on different educational levels only partly align with the expectations of the dualization literature - at least when we consider

only the low-educated typical outsiders. The positive association between EPL and employment of the high-educated as well as the differences found for ALMPs fit the theoretical considerations outlined above. Yet, wage bargaining institutions show the strongest associations with the employment of individuals with medium education levels instead of those with low education.

**Discussion**

This study explored the impact of labor market institutions on the social distribution of employment. In light of mixed evidence for institutional effects on overall employment levels, I drew on research observing a growing dualization in labor markets to investigate whether institutions that are argued to mostly benefit labor market insiders are associated with greater social inequality in employment. Reversing the logic of the argument, the study also looked at institutions that regulate the labor market without distinguishing between groups and that promote the employment of outsiders. The empirical analysis used data from 20 European countries and the US for 1992 to 2012 in two-way fixed effects models with fixed effects on the levels of country-specific socio-demographic groups. Breaking down institutional impact for men and women, youth, prime-aged and older workers, and low-, medium-, and high-educated individuals provided important insights.

First, the findings did not suggest strong relationships between institutions and overall employment – be it negative and positive. These results tie in with the mixed evidence delivered by previous studies on overall institutional impact (Baker et al., 2005; Baccaro and Rei, 2007; Avdagic and Salardi, 2013). By contrast, substantive and significant associations between institutions and the employment of single social groups indicated that institutions affect the social distribution of employment.

Second, the patterns revealed in the comparison of men and women, age groups, and educational levels partly corroborated the expectations of the dualization literature. In several

instances, institutions that arguably increase the insider/outsider divide were associated with greater social inequality, in particular EPL, unionization, and unemployment benefits. They were frequently associated with relatively lower employment among women, labor market entrants, and the low-educated. The findings for wage bargaining centralization tend in the opposite direction, underlining arguments about wage moderation in centralized systems. Minimum income benefits and ALMPs, both institutions that can be understood as social investment policies, were at times associated with greater equality as well when seen from a baseline of higher employment among men, the prime-aged, and the high educated. However, in several instances the evidence for the dualization arguments was only weak or even contradictory. The dualization argument worked well for differences between men and women, but less so for different age groups. For example, higher unionization was strongly associated with lower employment among the 55-64 year olds, possibly due to more generous early retirement schemes in such contexts. The findings also raised the question whether only the low-educated suffer from strong insider protection as wage bargaining institutions showed stronger associations with the employment of the medium-educated. In sum, the findings indicate that the insider/outsider argument provides a valuable heuristic when assessing the impact of institutions on the employment of typically disadvantaged groups and their peers in the core workforce. Yet, the dualization approach cannot fully explain heterogeneity in institutional impacts.

Besides alternative mechanisms, some limitations of this study may also help explain inconsistencies in the findings. First, the analysis neglected job quality. In the recent dualization literature, job-type is an important determinant of insider/outsider status. Individuals in atypical jobs are considered outsiders as well (e.g. Emmenegger et al., 2012; Rueda, 2005, 2014). Moreover, this study used rather broad categories of social groups and cross-sectional data that precludes looking at insider/outsider status from a life-course

perspective (Schwander and Häusermann, 2013). Thus, the data used to test the claims of the dualization literature could not fully model some of its arguments. Taking the present study as a starting point, further analyses using longitudinal data should explore how processes of inequality generation translate into differences in job quality. Existing research indicates that a strong insider/outsider divide results in larger proportions of disadvantaged groups in atypical employment (Biegert, 2014; Fervers and Schwander, 2015). Finally, the intention of the article was to investigate broad patterns connecting institutions and social inequality in employment using a straightforward theoretical argument about insiders and outsiders. Such broad analysis necessarily comes at the cost of neglecting details. For instance, ALMPs encompass several policy measures. Differences in the impact of spending on training, job search assistance, and job creation should be investigated more closely in future studies[16]. This as well as several results that did not fit the insider/outsider logic call for a stronger connection between research that analyses dualization processes in policy reforms and research that investigates the impacts of macro-level conditions on specific micro-level processes (e.g. Breen, 2005; Gebel and Giesecke, 2016).

Bearing these potentially fruitful extensions in mind, the analysis delivers evidence that in order to achieve a more socially inclusive labor market, reform efforts need to close the insider/outsider divide created by institutions that so far only benefit traditional insider groups. This does not necessarily imply deregulation and welfare state retrenchment. There are ways to salvage the benefits of classical institutions of coordination while at the same time making them accessible to wider parts of the population. For instance, unions increasingly represent the interests of outsiders (Benassi and Vlandas, 2016; Fervers and Schwander, 2015). Furthermore, in line with social investment arguments, the results show

[16] In robustness checks available upon request I divided public expenditure on ALMPs according to different types of measures. The findings indicate that training tends to help outsiders – in line with social investment arguments – while direct job creation rather worsens inequality.

that some institutions do not affect or even decrease inequality by affecting the whole labor market without discrimination and by promoting better integration of targeted groups.

The present study adds a crucial dimension to existing research on the importance of the institutional context for the outcomes of micro-level labor market processes (e.g. DiPrete et al., 2001; DiPrete et al., 2006; Brady et al., 2010). It shows that even as institutions are not strongly related to overall employment, they shape labor market inequality between men and women, age groups, and educational levels. As some groups face challenges at the micro-level already, the institutional context is central in boosting social equality in employment. To build a socially inclusive labor market we need to understand social heterogeneity in institutional impacts. Instead of focusing on the institutional impact on overall employment, consequences for social inclusion and cohesion need to be of central concern.

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**Appendix: Institutions and Employment in the Labor Force**

Reducing the analyzed population to the labor force, i.e. using a dependent variable coded (1) for employment and (0) for unemployment and excluding the economically inactive from the analysis (N=2,319,325), yields patterns that partly corroborate the findings for the total working age population but also show notable differences in several instances. Figures A1 to A3 mirror the models displayed in Figures 1 to 3 with the reduced sample (Table A1 mirrors Table 2). Figure A1 shows the same differences in institutional impacts on the employment of men and women as the analysis for the working age. However, these differences are smaller and not significant in some cases. For instance, EPL is associated with higher unemployment of women whereas there is no significant association with the employment of men. Yet, the difference between men and women is not significant. Unionization, centralization, unemployment benefits, and minimum income benefits are associated with the unemployment of men and women along the same lines as they are associated with joblessness. Here, the differences are significant. Overall, like in the analysis of the working age population, the model for men and women supports the theoretical considerations on insider/outsider effects of institutions. That the differences tend to be smaller indicates that men and women are more similar in the labor force.

*<Insert Figure A1 here>*

The differences between the two samples are larger in the analysis of institutional impacts on age groups. In the labor force, we find evidence for a negative association between EPL and the employment of labor market entrants. The negative association of unionization with employment is not restricted to older workers but is also found for the prime-aged. Furthermore, there is a positive association with the employment of labor market entrants (significant on the 10%-level). Similarly, centralization is negatively associated with the prime-aged (on the 10% significance level) and older workers. Unemployment among

labor market entrants is significantly higher when there are more generous benefits. In the case of unemployment benefits, this could be interpreted along the lines of insider/outsider bargaining power effects. Yet, this does not explain the negative association with minimum income benefits. Finally, ALMPs' positive association with the employment of labor market entrants is larger in the labor force.

*<Insert Figure A2 here>*

Comparing the findings for educational levels there are again some notable differences between the working age population and the labor force. For instance, the medium-educated display a negative association with EPL in addition to the negative association with unionization. Furthermore, the low-educated show negative associations with both benefit schemes. There is also a negative association of unemployment benefits with the employment of the medium-educated. The results for unemployment benefits are in line with the insider/outsider argument. Yet, like in the case of age groups, finding a negative association for the low-educated and minimum income benefits rather points to disincentive effects as advocated by orthodox economics. Finally, ALMPs show a strong positive association with the low-educated contrasted by a negative association with the high-educated.

*<Insert Figure A3 here>*

Whereas in the case of sex differences the two samples showed comparable patterns, the differences between analyzing the whole working age population and the labor force are more complex for age groups and educational levels. These differences warrant further investigation. This study is primarily interested in the degree of inclusiveness of labor markets. For this purpose, the employment of the whole working age population is the more appropriate indicator.

**Table 1: Institutional Indicators' Mean by Country and Within-Country Standard Deviation (in Parentheses)**

| | EPL | Unionization | Wage Barg. Centraliz. | Unempl. Benefits | Minimum Income Ben. | ALMPs | N |
|---|---|---|---|---|---|---|---|
| AT | 2.5 (.19) | .34 (.04) | .92 (.04) | .62 (.02) | .43 (.02) | .14 (.03) | 18 |
| BE | 1.9 (.06) | .53 (.02) | .46 (.00) | .61 (.01) | .34 (.01) | .10 (.02) | 21 |
| CH | 1.6 (.00) | .19 (.02) | .31 (.04) | .78 (.01) | .52 (.04) | .16 (.03) | 17 |
| CZ | 3.2 (.14) | .21 (.05) | .25 (.01) | .51 (.07) | .45 (.06) | .03 (.01) | 15 |
| DE | 2.7 (.03) | .24 (.05) | .46 (.03) | .65 (.01) | .53 (.01) | .13 (.03) | 21 |
| DK | 2.1 (.03) | .73 (.03) | .48 (.03) | .63 (.04) | .54 (.04) | .30 (.08) | 21 |
| EE | 2.4 (.45) | .08 (.01) | .35 (.01) | .52 (.04) | .26 (.03) | .01 (.00) | 8 |
| ES | 2.5 (.42) | .16 (.01) | .36 (.02) | .63 (.03) | .21 (.01) | .05 (.02) | 21 |
| FI | 2.2 (.10) | .73 (.04) | .40 (.01) | .62 (.04) | .54 (.04) | .10 (.01) | 18 |
| FR | 2.4 (.06) | .08 (.00) | .21 (.00) | .69 (.01) | .33 (.01) | .11 (.01) | 20 |
| HU | 2.0 (.00) | .18 (.01) | .24 (.01) | .48 (.06) | .25 (.05) | .06 (.02) | 13 |
| IE | 1.4 (.07) | .40 (.07) | .51 (.03) | .46 (.03) | .39 (.04) | .12 (.04) | 17 |
| NL | 2.9 (.03) | .21 (.02) | .57 (.02) | .74 (.03) | .42 (.01) | .31 (.09) | 17 |
| NO | 2.3 (.00) | .55 (.01) | .51 (.01) | .69 (.01 | .57 (.08) | .19 (.02) | 17 |
| PL | 2.2 (.00) | .16 (.02) | .21 (.02) | .29 (.04) | .29 (.01) | .04 (.02) | 10 |
| PT | 4.4 (.26) | .21 (.02) | .34 (.00) | .77 (.01) | .36 (.02) | .09 (.03) | 16 |
| SE | 2.7 (.06) | .76 (.06) | .51 (.01) | .69 (.10) | .53 (.06) | .20 (.06) | 18 |
| SI | 2.6 (.02) | .28 (.04) | .32 (.00) | .66 (.00) | .38 (.01) | .05 (.01) | 8 |
| SK | 2.3 (.19) | .23 (.06) | .50 (.00) | .59 (.03) | .41 (.10) | .02 (.00) | 14 |
| UK | 1.2 (.08) | .30 (.04) | .10 (.01) | .33 (.03) | .37 (.01) | .05 (.02) | 20 |
| US | 0.3 (.00) | .13 (.01) | .16 (.02) | .55 (.04) | .19 (.02) | .03 (.01) | 21 |
| TOTAL | 2.2 (.16) | .34 (.04) | .39 (.02) | .60 (.04) | .40 (.04) | .12 (.04) | 351 |

Note: For sources and definitions see text.

**Table 2: Linear Probability Regression Models of Employment on Labor Market Institutions and their Interactions with Sex, Age Group, and Education**

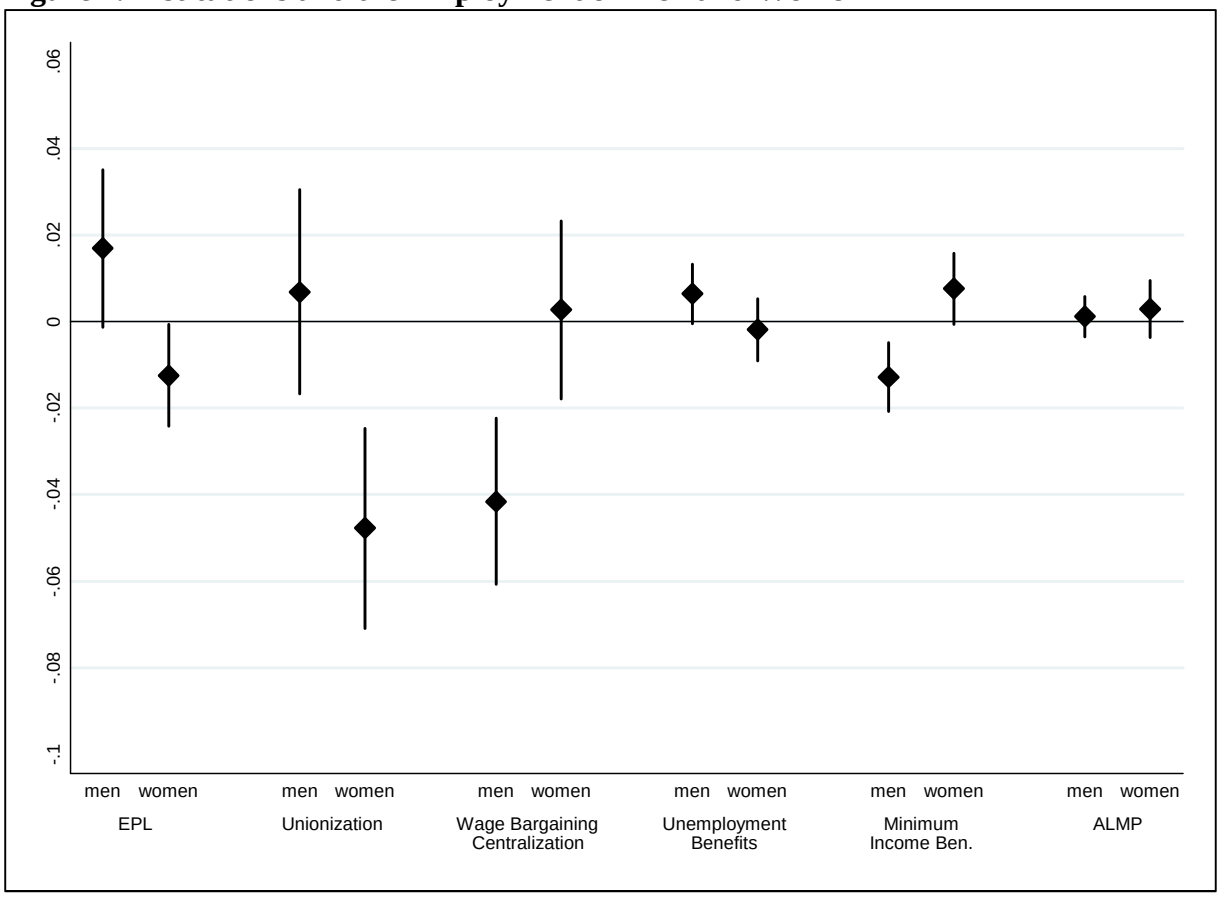
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE | B | SE |
| EPL | .002 | .006 | .017† | .009 | .006 | .005 | -.004 | .007 |
| Unionization | -.021† | .011 | .007 | .012 | .001 | .010 | -.048*** | .011 |
| Centralization | -.019* | .008 | -.042*** | .010 | -.024** | .008 | -.012 | .008 |
| Unemp. Ben. | .002 | .003 | .006† | .003 | -.002 | .003 | .001 | .003 |
| Minimum Inc. Ben. | -.003 | .003 | -.013** | .004 | .001 | .003 | .001 | .003 |
| ALMP | .002 | .003 | .001 | .002 | .004 | .003 | .003 | .002 |
| | | | | | | | | |
| sex (ref. male) | | | | | | | | |
| female | | | -.355*** | .055 | | | | |
| EPL*fem. | | | -.029** | .011 | | | | |
| Unionization*fem. | | | -.055*** | .010 | | | | |
| Centralization*fem. | | | .044** | .013 | | | | |
| Unemp. Ben. *fem. | | | -.008† | .005 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Minimum Inc. Ben. *fem. | .020*** | .005 | | | | |
| ALMP*fem. | .002 | .003 | | | | |
| | | | | | | |
| age groups (ref. 30-54) | | | | | | |
| 15-29 | | | .029 | .074 | | |
| 55-64 | | | -.287*** | .029 | | |
| EPL*15-29 | | | -.016 | .013 | | |
| EPL*55-64 | | | -.003 | .007 | | |
| Unionization*15-29 | | | -.003 | .019 | | |
| Unionization*55-64 | | | -.105*** | .013 | | |
| Centralization*15-29 | | | .028 | .021 | | |
| Centralization*55-64 | | | -.001 | .015 | | |
| Unemp. Ben. *15-29 | | | .006 | .007 | | |
| Unemp. Ben. *55-64 | | | .014** | .005 | | |
| Minimum Inc. Ben. *15-29 | | | -.008 | .009 | | |
| Minimum Inc. Ben. *55-64 | | | -.009t | .005 | | |
| ALMP*15-29 | | | .002 | .005 | | |
| ALMP*55-64 | | | -.014** | .004 | | |
| | | | | | | |
| education (ref. medium) | | | | | | |
| low | | | | | .426*** | .062 |
| high | | | | | .187*** | .018 |
| EPL*low | | | | | .007 | .008 |
| EPL* high | | | | | .019*** | .005 |
| Unionization* low | | | | | .071*** | .008 |
| Unionization* high | | | | | .056*** | .006 |

| | | |
|---|---|---|
| Centralization* low | -.011 | .010 |
| Centralization* high | -.014* | .006 |
| Unemp. Ben. * low | .001 | .004 |
| Unemp. Ben. * high | .002 | .003 |
| Minimum Inc. Ben. * low | -.006 | .004 |
| Minimum Inc. Ben. * high | -.003 | .003 |
| ALMP* low | .004† | .002 |
| ALMP*high | -.011*** | .002 |

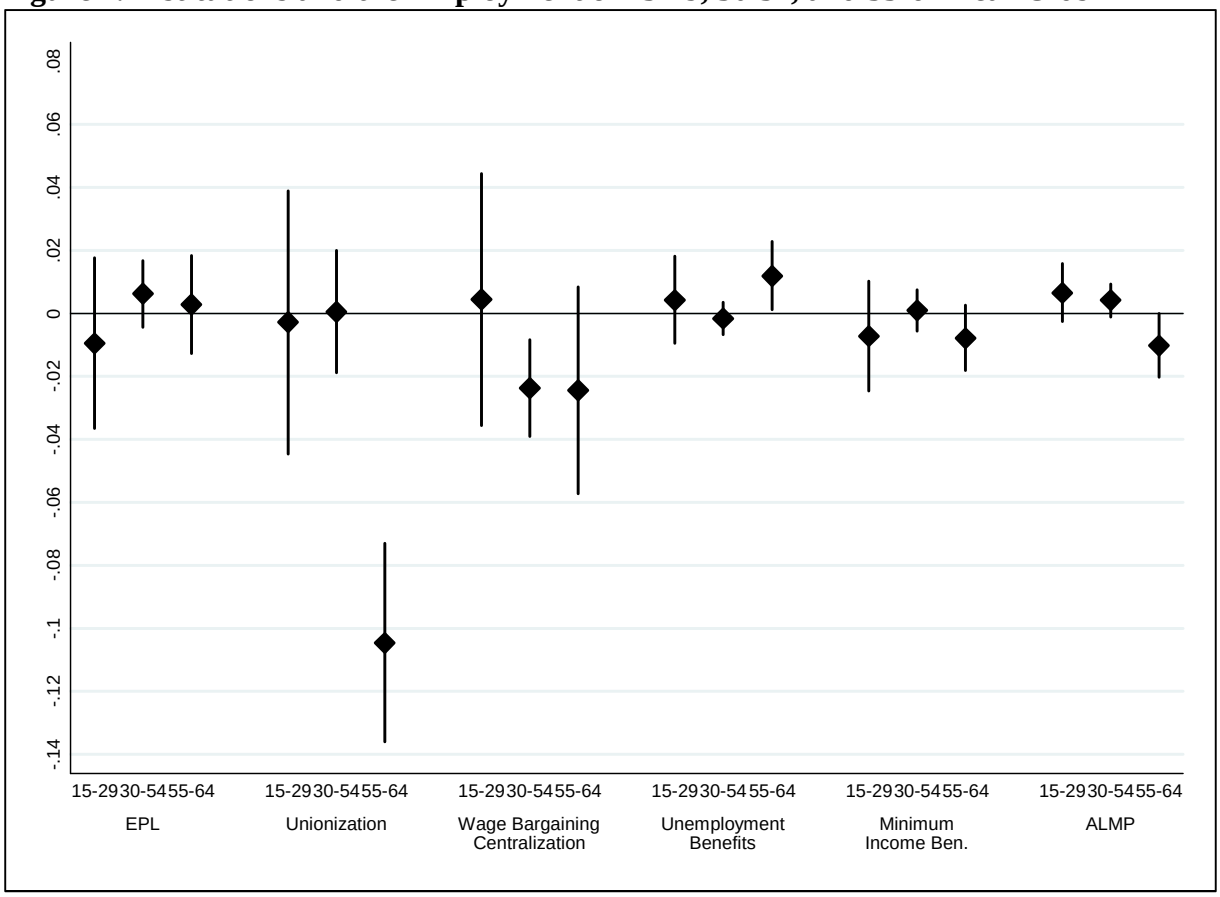
Note: N=2,983,500; standardized coefficients, all institutional indicators are lagged by one year, models control for marital status, labor taxes, childcare, bargaining coverage, output gap, lagged employment rate, models include country*sex*age group*education dummies and wave dummies, ***<.001, **<.01, *<.05, †<.1.

**Figure 1. Institutions and the Employment of Men and Women**



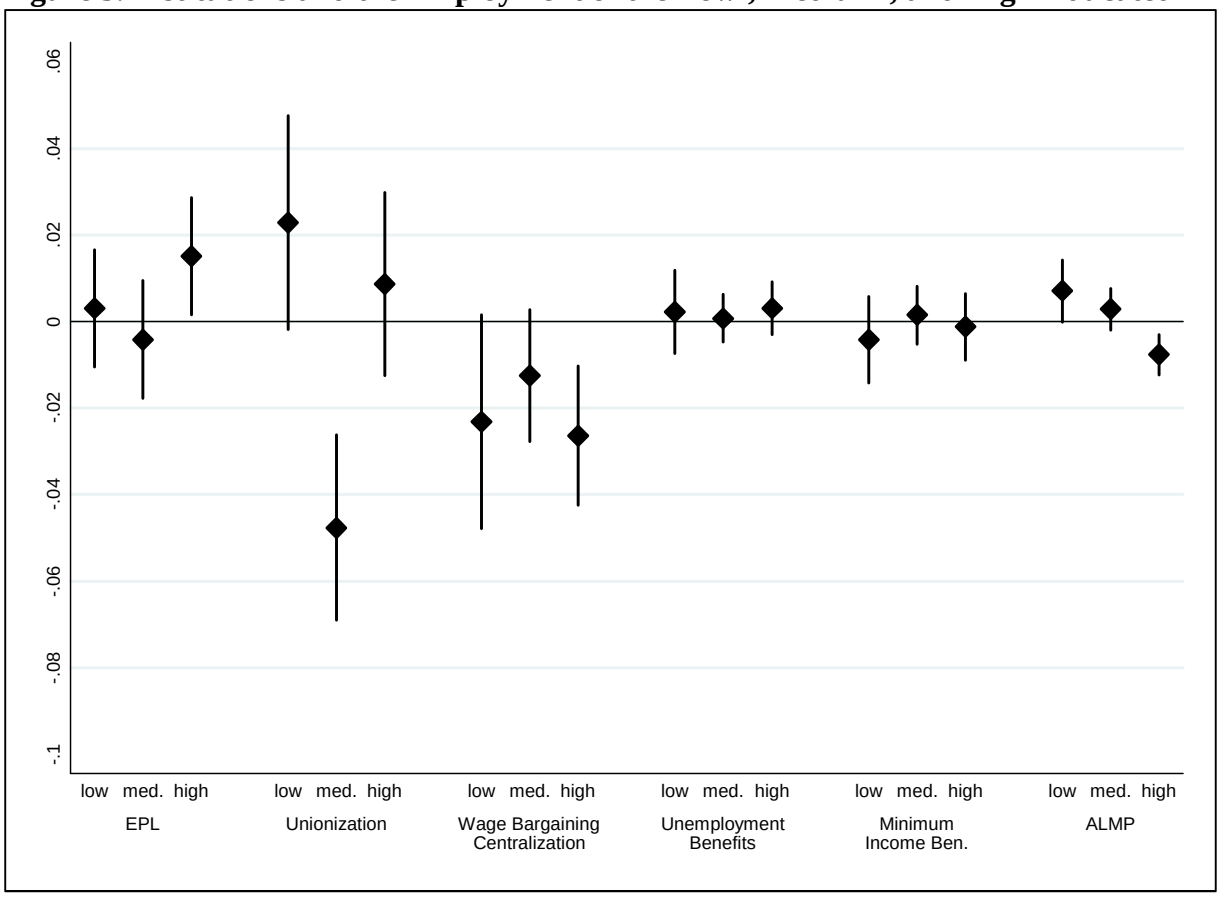

*Note*: Predicted coefficients and 95% confidence intervals based on Model 2, Table 2.

**Figure 2. Institutions and the Employment of 15-29, 30-54, and 55-64 Year Olds**




*Note*: Predicted coefficients and 95% confidence intervals based Model 3, Table 2.

**Figure 3. Institutions and the Employment of the Low-, Medium-, and High-Educated**




*Note*: Predicted coefficients and 95% confidence intervals based on Model 4, Table 2.

**Table A1: Linear Probability Regression Models of Employment on Labor Market Institutions and their Interactions with Sex, Age Group, and Education (sample: labor force)**

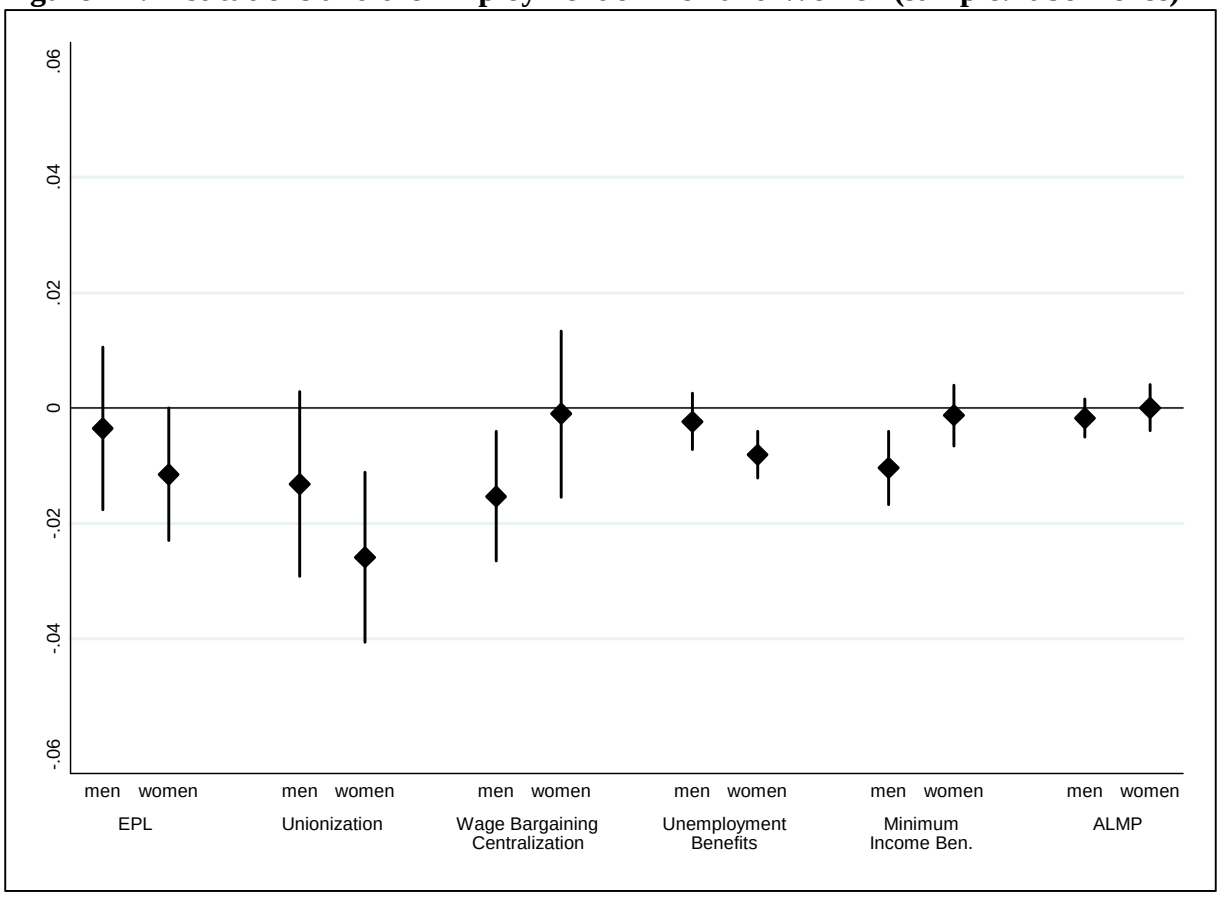
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | B | SE | B | SE | B | SE | B | SE |
| EPL | -.007 | .006 | -.004 | .007 | .001 | .006 | -.021** | .007 |
| Unionization | -.019** | .007 | -.013 | .008 | -.030*** | .007 | -.027** | .008 |
| Centralization | -.009 | .006 | -.015** | .006 | -.010† | .006 | -.009 | .006 |
| Unemp. Ben. | -.005* | .002 | -.002 | .002 | -.003† | .002 | -.006** | .002 |
| Minimum Inc. Ben. | -.006* | .003 | -.010** | .003 | .000 | .002 | -.004 | .003 |
| ALMP | -.001 | .002 | -.002 | .002 | -.003† | .002 | -.001 | .002 |
| | | | | | | | | |
| sex (ref. male) | | | | | | | | |
| female | | | .011 | .039 | | | | |
| EPL*fem. | | | -.008 | .006 | | | | |
| Unionization*fem. | | | -.013* | .006 | | | | |
| Centralization*fem. | | | .014* | .006 | | | | |
| Unemp. Ben. *fem. | | | -.006* | .002 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Minimum Inc. Ben. *fem. | .009** | .003 | | | | |
| ALMP*fem. | .002 | .001 | | | | |
| | | | | | | |
| age groups (ref. 30-54) | | | | | | |
| 15-29 | | | -.060 | .050 | | |
| 55-64 | | | -.026 | .018 | | |
| EPL*15-29 | | | -.027** | .010 | | |
| EPL*55-64 | | | .004 | .006 | | |
| Unionization*15-29 | | | .052*** | .008 | | |
| Unionization*55-64 | | | -.009 | .006 | | |
| Centralization*15-29 | | | .011 | .012 | | |
| Centralization*55-64 | | | -.014 | .009 | | |
| Unemp. Ben. *15-29 | | | -.011* | .004 | | |
| Unemp. Ben. *55-64 | | | .006† | .003 | | |
| Minimum Inc. Ben. *15-29 | | | -.030*** | .004 | | |
| Minimum Inc. Ben. *55-64 | | | -.004 | .002 | | |
| ALMP*15-29 | | | .016*** | .003 | | |
| ALMP*55-64 | | | -.005* | .002 | | |
| | | | | | | |
| education (ref. medium) | | | | | | |
| low | | | | | .041 | .051 |
| high | | | | | .074*** | .016 |
| EPL*low | | | | | .027** | .009 |
| EPL* high | | | | | .014* | .006 |
| Unionization* low | | | | | .042*** | .010 |
| Unionization* high | | | | | .017** | .005 |

| | | |
|---|---|---|
| Centralization* low | -.010 | .012 |
| Centralization* high | .010† | .006 |
| Unemp. Ben. * low | -.006 | .005 |
| Unemp. Ben. * high | .005† | .003 |
| Minimum Inc. Ben. * low | -.011* | .005 |
| Minimum Inc. Ben. * high | .008** | .003 |
| ALMP* low | .011*** | .002 |
| ALMP*high | -.011*** | .001 |

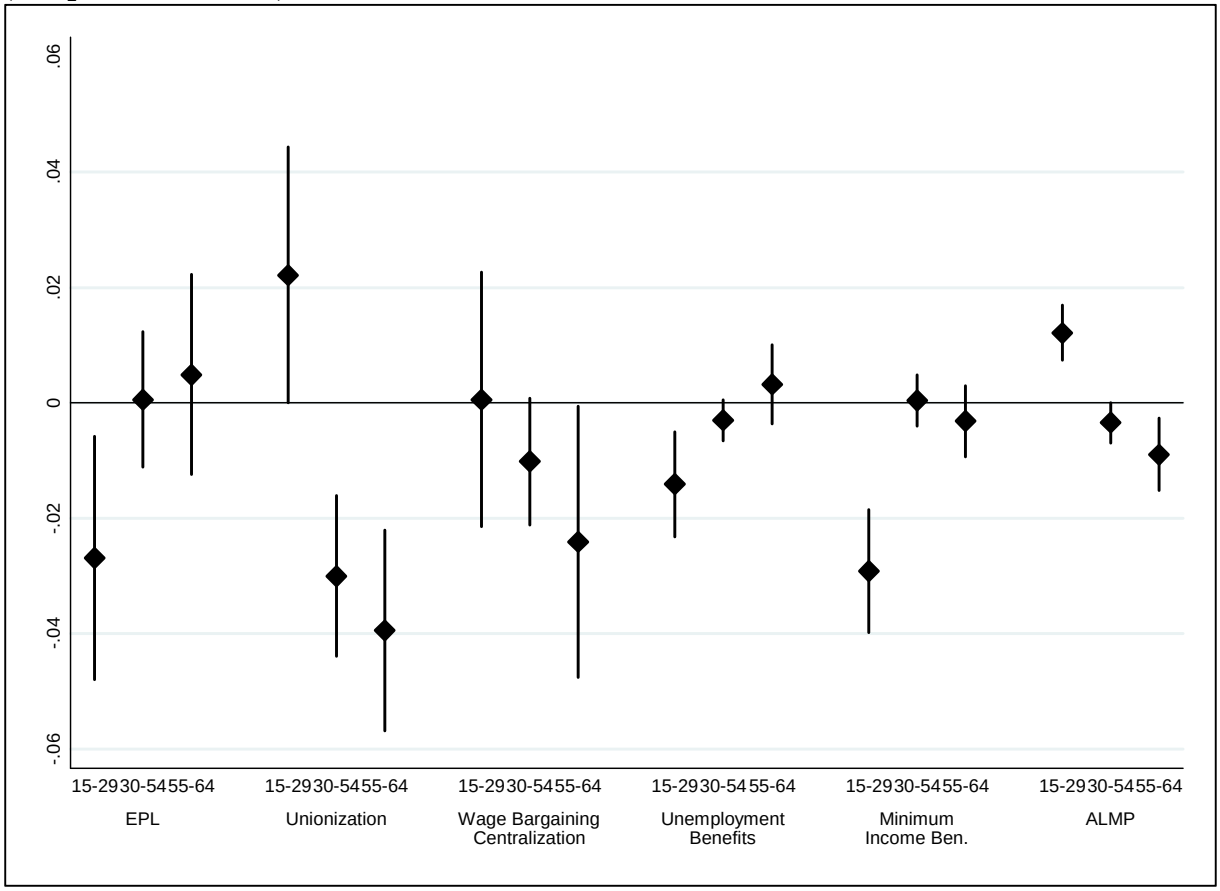
Note: N=2,319,325, standardized coefficients, all institutional indicators are lagged by one year, models control for marital status, labor taxes, childcare, bargaining coverage, output gap, lagged employment rate, models include country*sex*age group*education dummies and wave dummies, ***<.001, **<.01, *<.05, †<.1.

**Figure A1. Institutions and the Employment of Men and Women (sample: labor force)**



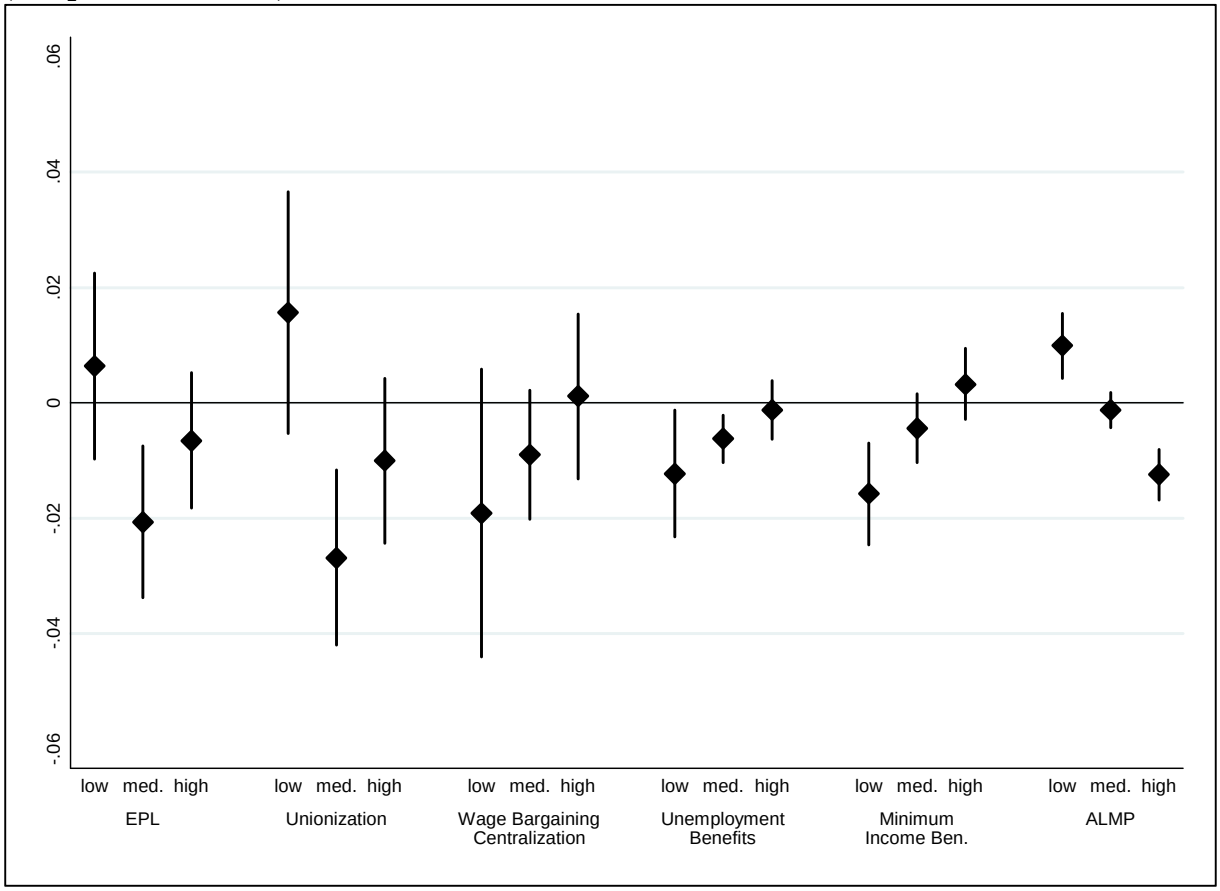

*Note*: Predicted coefficients and 95% confidence intervals based on Model 2, Table A1.

**Figure A2. Institutions and the Employment of 15-29, 30-54, and 55-64 Year Olds (sample: labor force)**




*Note*: Predicted coefficients and 95% confidence intervals based Model 3, Table A1.

**Figure A3. Institutions and the Employment of the Low-, Medium-, and High-Educated (sample: labor force)**




*Note*: Predicted coefficients and 95% confidence intervals based on Model 4, Table A1.