The Decline of Wage Bargaining, Rising Wage Dispersion, and the Gender Wage Gap

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PRELIMINARY – PLEASE DO NOT QUOTE!

Abstract: This paper investigates the recent decline in wage bargaining, the related increase in wage inequality, and the consequences these two trends have for the development of the gender wage gap in West Germany between 2001 and 2006. Using linked employer-employee data we find that wage dispersion is rising, driven not only by wage increases at the top of the wage distribution, but also by real wage losses below the median. At the same time, coverage under collective wage bargaining plunged between 2001 and 2006 by 16.9 percentage points (pp) for male employees and by 19.7 pp for female workers. Hence, in 2006, about half of West German full-time employees is not covered by a collective bargaining agreement anymore, compared to about 30% in 2001 in industries covered in both years' data sets. Despite rising wage dispersion and sharply declining union coverage, the gender wage gap remained rather stable between 2001 and 2006, with moderate relative gains for women below the median. Analyzing the link between collective bargaining coverage and the gender wage gap we find that in 2006 women seem to benefit relative to men from being covered by sectoral bargaining regimes, while there is no such clear tendency in 2001. This suggests that the decrease in union coverage prevented a further decline of the gender wage gap. Finally, separating composition from price effects in a quantile regression framework we find that characteristics play an increasing role in explaining the gender wage gap while the scope of price discrimination decreased.

Keywords: Wage Distribution, Gender Wage Gap, Collective Bargaining, Quantile Regression, Decomposition

JEL-Classification: J31, J51, J52, C21

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Contents

1 Introduction

Wage inequality has been increasing in most industrialized countries during the past years while at the same time coverage by collective wage bargaining has declined sharply. Moreover, the gender wage gap has declined in most of these countries over the last decades. This paper investigates the link between those trends for West Germany. We seek to answer the question, what the decline in union coverage and the related change in the wage structure imply for the development of the gender wage gap.

Firstly, wage inequality has been rising in Germany during recent years (Antonczyk et al., 2008; Dustmann et al., 2007; Kohn, 2006; Gernandt and Pfeiffer, 2006) both at the bottom and the top of the wage distribution. Compared to the strong increases in wage inequality in the US and the UK since the early 1980s, the increase in wage inequality in Germany was restricted to the top of the wage distribution in the 1980s and wage inequality at the bottom of the wage distribution only started to grow in the mid 1990s (Dustmann et al., 2007; Kohn, 2006; Fitzenberger, 1999; Gernandt and Pfeiffer, 2006). It is likely that until the mid 1990s growing wage inequality at the bottom of the wage distribution was prevented by labor market institutions such as unions and implicit minimum wages implied by the welfare state (Fitzenberger, 1999; Fitzenberger et al., 2008; Dustmann et al., 2007).

Secondly, coverage under union wage contracts as reported in the German Structure of Earnings Survey plummeted between 2001 and 2006 by 16.9 percentage points (pp) for male workers and by 19.7 pp for female workers in West Germany (see section 5.3). Since collective bargaining is associated with wage compression (Fitzenberger et al., 2008; Burda et al., 2008), this strong and unprecedented decline of the wage bargaining institutions in Germany is likely to have contributed to the increase in wage inequality.

Finally, the gender wage gap in Germany has been falling over time (Fitzenberger and Wunderlich, 2002; Black and Spitz-Oener, 2007; Sohr and Stephan, 2005) but women still earn about 20 % less than men at the median. Notwithstanding, Antonczyk (2007) and Black and Spitz-Oener (2007) analyze the development of the gender wage gap in West Germany until 2004, resp. 2001, and find that after some decades of an increase in relative female wages, the gender wage gap stagnated in recent years.

Putting these trends together, this paper investigates as to whether and to what extent the recent increase in wage inequality between 2001 and 2006 and the decline in wage bargaining is related to the development of the gender wage gap. Even though unions have been demanding greater gender equality in the labor market, there is very little empirical evidence regarding the relationship between union wage bargaining and the gender wage gap (Gartner and Stephan, 2009; Heinze and Wolf, 2006; Meng and Meurs, 2004; Edin and Richardson, 2002) and to our knowledge only one which considers the

entire wage distribution (Felgueroso et al., 2008). Since unions generally tend to reduce wage dispersion and women are typically concentrated at the lower end of the wage distribution, one may expect that collective wage bargaining reduces the gender wage gap and hence the drop in coverage may result in an increase of gender wage differences (Gartner and Stephan, 2009, p.13). However, since union membership of male workers is higher than of female workers (Fitzenberger et al., 2006), one may expect that unions represent more strongly the interests of males compared to females. Therefore, it is empirically an open question how the decline in wage bargaining institutions affects the gender wage gap.

Our main contribution is thus to relate the trends in union coverage and wage inequality to the development of the gender wage gap. In addition, this is the first study to use the latest available cross-section of the German Structure of Earnings Survey for 2006 and to compare it to the cross-section for 2001. As major labor market reforms took place in Germany during this time period, it is of highest interest to see how the wage structure changed between these two years. By employing a quantile regression framework, we analyze the gender wage gap over the entire wage distribution, and not only at the mean. Finally, in order to separate the gender wage differences into those parts stemming from characteristics and from price effects, we employ the decomposition techniques proposed by Machado and Mata (2005) and Melly (2006) within each bargaining regime.

Traditionally in Germany, most employment conditions – among them most prominently wages – are negotiated in collective bargaining between unions and employers' associations. Bargaining can take place at the industry level ("Flächentarifvertrag" or sectoral collective contract) or at the firm or plant level ("Firmentarifvertrag" or "Betriebsvereinbarung"). As it is forbidden by law to discriminate against non-union-members, all employees and not only union members benefit from the collective agreements. For this reason coverage rates are much higher than membership rates. In addition, even those agreements which are not reached by general collective bargaining often adapt parts of the general agreement, thereby increasing the scope of collective bargaining even further.

Our results show that wage dispersion is rising, driven not only by wage increases at the top, but even more so by real wage losses below the median. Regarding union coverage, we find that the share of employees under an industry-wide collective contract dropped sharply, as well as the share of individuals covered by a firm-level contract. In our data set in 2006, about half of West German employees is not covered by a collective bargaining agreement, compared to about 30% in 2001 which constitutes a sharp decline in collective wage bargaining coverage. Despite rising wage inequality and sharply declining collective bargaining coverage, the gender wage gap remained rather stable between 2001 and 2006 in West Germany, with moderate relative gains for women below the median. In particular, the gender wage gap widened for high-skilled women, while it declined

for low-skilled women and for those medium-skilled women at the bottom of the wage distribution. We also find that below the median women gained relative to men under sectoral agreements and without collective agreements, but above the median only women in sectoral agreements were able to gain relative to men. As a result, in 2006 the gender wage gap is smaller for those employees covered by sectoral wage bargaining, while there is no such clear tendency in 2001. We conclude that the falling rate of (sectoral) bargaining coverage might have prevented a further decline of the gender wage gap. Finally, as the decomposition results show, the importance of discriminating price effects declined over time.

This paper proceeds as follows: The next section reviews the existing literature. Section 3 describes the decomposition technique based on quantile regression. In section 4 the data are briefly described before presenting the empirical results in section 5. Finally, section 6 provides some concluding remarks.

2 Literature

There is a vast literature concerning all three of the mentioned trends separately. Kohn (2006) considering the entire time period from 1975 to 2001 detects rising inequality in the 1980s only at the top of the wage distribution, whereas since the 1990s higher wage dispersion is observed in all parts of the distribution (see also Dustmann et al., 2007; Fitzenberger, 1999; Gernandt and Pfeiffer, 2006). These long-term trends seem to lag the US development about one decade behind and appear to be caused to a considerable extent by skill-biased technological change (Black and Spitz-Oener, 2007; Dustmann et al., 2007). Antonczyk et al. (2008) however, using data covering the years 1999 and 2006, show that the very recent increase of wage dispersion among German male workers cannot be explained by skill-biased technical change and point out the importance to consider the impact of institutional changes, such as deunionization (see also Dustmann et al., 2007).

Hence, one of the main reasons for the increase in wage inequality is the recent decline in collective wage bargaining. After decades of relative stability, collective bargaining coverage in Germany, i.e. the share of employment contracts which follow collective agreements, is in decline since the mid 1990s, so that in 2003 70% of West German employees and 45% of firms are covered by a collective agreement (Schnabel, 2005). It should be noted that union membership of male employees has also dropped sharply in the past decades in Germany, whereas that of female employees has been more or less stable albeit at a much lower level (ibid, p.185, also Kohn and Lembcke, 2007; Card et al., 2003). This weakening of union power has likely contributed to the increase in wage inequality

as several papers show.[1] In the US context about 20% of the increase in wage inequality can be attributed to deunionization (Card, 2001; Addison et al., 2007) while for Germany Dustmann et al. (2007) argue that about 28% of the increase in lower tail inequality is due to deunionization and only 11% at the top of the distribution. Moreover, for the US, Card (2001) shows that characteristics, as well as the returns to those characteristics are compressed under collective bargaining, but the latter effect is more modest for women compared to men.

The gender wage gap has been falling in most industrialized countries over the past decades (Blau and Kahn, 1996; Arulampalam et al., 2005) and also in Germany (Black and Spitz-Oener, 2007; Antonczyk, 2007; Sohr and Stephan, 2005; Fitzenberger and Wunderlich, 2002; Lauer, 2000). Notwithstanding, Black and Spitz-Oener (2007) and Antonczyk (2007) observe a stagnation in Germany in recent years. Blau and Kahn (1997) and Black and Spitz-Oener (2007) come to the conclusion that skill-biased technological change has worked in favor of women, contributing to the decline of the gender wage gap. Most recent studies look at the entire distribution of the gender wage gap and find that it increases over the distribution (the so-called "glass-ceiling", see Arulampalam et al., 2005; de la Rica et al., 2008; Albrecht et al., 2003). However, the opposite trend of an enlarged gender wage gap at the lower end of the wage distribution has also been detected (Arulampalam et al., 2005), in particular for low-skilled women (sometimes labeled "glass floor", see de la Rica et al., 2008 or "sticky floor", see Drolet and Mumford, 2009).

Despite the large magnitude and relevance of those trends, there has been very little literature which combines them. For the US, Blau and Kahn (1997) note that deunionization has affected men more strongly than women thereby contributing to the closing of the gender wage gap. Edin and Richardson (2002) view unions as effective in reducing within-industry wage differences, accepting in turn higher between-industry differences. They conclude that the resulting increase in the interindustry wage differential, has partly counteracted the closing of the gender wage gap in Sweden. Meng and Meurs (2004) also use the decomposition approach from Juhn et al. (1993), taking France and Australia as examples for countries with a more and a less centralized wage bargaining regime, respectively. They find that in both countries firms use their scope in wage setting (which is higher in a less centralized system like Australia) to reduce the gender wage differential (ibid, p.197). For Germany, Heinze and Wolf (2006) find the the gender wage gap is lower within firms compared to the overall wage differential suggesting some homogeneity of workers within a firm. Moreover, they find a lower gender wage gap for firms applying formalized co-determination (works council) or collective wage agreements. The

[1]For an international perspective see Card (2001); Card et al. (2003); Addison et al. (2007); de la Rica et al. (2008), and for Germany: Fitzenberger (1999); Gerlach and Stephan (2005b); Fitzenberger and Kohn (2006); Kohn and Lembcke (2007).

same result is found by Gartner and Stephan (2009) who try to resolve the problem of self-selection of firms into collective bargaining by using a matching approach. Their decomposition results show that the observation of a lower wage differential is driven by reduced productivity differences or less wage discrimination in the unionized wage bargaining setting, as well as a stronger residual wage compression. Finally, Felgueroso et al. (2008) take account of the entire distribution of the gender wage gap in the different Spanish wage bargaining regimes. In centralized collective wage bargaining they find an increasing gender wage gap over its distribution which they explain by the Median Voter Theorem. According to this, unions care mostly about employees at the bottom of the wage distribution trying to enforce a minimum wage. In this scenario, however, unions have less control about additional wage components and therefore firms are able to pay higher (potentially discriminatory) bonuses. In contrast, when collective wage bargaining takes place on the firm level, unions have a stronger control that actual wages are close to agreed wages and therefore the resulting wage gap is more stable over the entire distribution. Hence, the relation between the wage structure, collective bargaining and the gender wage gap is manifold and will therefore be investigated in the following.

3 Methodology

To analyze the effect of unionization on the *entire wage distribution*, the empirical investigation will focus on using a set of quantile regression estimates. This allows describing wage compression due to collective bargaining and its impact on the difference between the wage distributions by gender.

Specify the function of log hourly wages w conditional on the set of covariates X at the τth quantile as

$$(1) \quad q_w(\tau|X) = X'\beta(\tau) \, .$$

We estimate such quantile regressions separately for each year, for each wage bargaining regime, and for male and female workers.

Quantile regression as introduced by Koenker and Bassett (1978) allows estimation of the coefficients $\beta(\tau)$ at the considered quantile τ. Thus, quantile regressions take the entire distribution into account, whereas least squares regressions take only the wage level at the mean into account. We analyze differences across the conditional wage distribution by means of quantile regressions.

Analogously to OLS regressions, sampling weights are employed and inference has to account for clustering. Standard errors of the quantile regression coefficients therefore

need to be adjusted appropriately.[2] We account for the sampling weights when bootstrapping by resampling in a pairwise bootstrap (design-matrix bootstrap) the weights in addition to the vector of the dependent variable and the covariates. We estimate clustered standard errors by applying a block bootstrap procedure where we resample all observations within an establishment to account for correlation within establishments.[3]

3.1 Decomposition of unconditional quantile functions

We decompose the gender wage gap, defined as the difference of log wages between male and female employees, over the entire wage distribution. Compared to the decomposition technique proposed by Oaxaca (1973) and Blinder (1973) this has the advantage, that the entire distribution is taken into account and not only the mean of log wages.

One can decompose the difference of the unconditional sample quantile functions for the τ^{th} quantile between male and female employees (denoted by $\hat{q}_{male}(\tau)$ and $\hat{q}_{female}(\tau)$) as follows:

$$(2) \quad \hat{q}_{male}(\tau) - \hat{q}_{female}(\tau) = \left[\hat{q}_{male}(\tau) - \hat{q}_{\beta_f, x_m}(\tau)\right] + \left[\hat{q}_{\beta_f, x_m}(\tau) - \hat{q}_{female}(\tau)\right]$$

where $\hat{q}_{\beta_f, x_m}(\tau)$ is the estimated counterfactual quantile function, i.e. the quantile function of wages that would be generated for female workers had they male characteristics (x_m: male characteristics) but were still paid according to female coefficients (β_f: female coefficients, i.e. female conditional wage distributions for given characteristics). Analogously, at the same time the counterfactual term $\hat{q}_{\beta_f, x_m}(\tau)$ represents the quantile of the hypothetical wage distribution of male workers (x_m) were they paid like female employees (β_f).[4] We decide to use this counterfactual as we argue that this is the more policy relevant one (as compared to using the counterfactual with female characteristics and male coefficients): The characteristics of the female population may be influenced over time (e.g. through additional education), while the coefficients, which reflect prices, are more difficult to be influenced in a market economy.

The first term on the right hand side of equation (2) denotes the coefficient effect. The second term captures the effect of the workers' characteristics. This method is an extension of the decomposition of average effects introduced by Blinder (1973) and Oaxaca (1973). For quantile treatment effects the method usually employed is derived by Machado and

[2]Fitzenberger et al. (2008) show how to estimate the covariance matrix $\widehat{VAR}(\hat{\beta}(\tau))$ accounting for weights and cluster effects.

[3]Full results for inference will be provided in the next version of this paper.

[4]In this early version of the paper we decompose the gender wage gap into a total characteristic effect and coefficient effect only. In the following version we seek to extend the decomposition in order to separate firm from individual-specific effects, exploiting thus fully the rich information of the linked employer-employee data-set used.

Mata (2005). In our analysis, we use the alternative approach proposed by Melly (2006) for greater ease in computation. We are planning to bootstrap the Melly estimates in the next version of this paper.

The quantile functions (1) are estimated separately for male and female workers and for each year. Since the coefficients $\beta^z(\tau)$ differ by the z subsamples with individual coverage, industry-level bargaining, and firm-level bargaining (except for the coefficient of the constant), computations of counterfactual quantile functions and hence quantile treatment effects have to take account of this heterogeneity.[5] We estimate unconditional quantile functions for covered (separately for coverage at the industry and at the firm level) and uncovered employees using their sample counterparts, which leaves the counterfactual distribution to be estimated. Following Melly (2006), we estimate the counterfactual quantile function as

$$(3) \quad \hat{q}_{\beta_f, x_m}(\tau) = \inf\left(q : \frac{1}{N_{male}} \sum_{j:male} \hat{F}_{female}(q|X_j) \geq \tau\right),$$

where N_{male} is the number of male employees in the sample $\{j : male\}$ and $\hat{F}_{female}(q|X_j)$ is the conditional distribution function of wages in the sample of females evaluated at the characteristics X_j of the male worker j. A natural estimate for the counterfactual conditional distribution function $F_s(q|X_j)$ would be given by

$$(4) \quad \hat{F}_{female}(q|X_j) = \sum_{m=1}^{M} (\tau_m - \tau_{m-1}) \mathbb{1}(X_j' \hat{\beta}_{female}(\tau_m) \leq q).$$

where $\mathbb{1}$ is an indicator function and $\hat{\beta}_{female}(\tau_m)$ is the sequence of $m = 1, ..., M$ piece-wise constant quantile regression coefficient estimates. However, this would be very computationally intensive iterative procedure, because in a large scale application as ours M, the number of piece-wise constant regressions is very large. Instead we resort to a practical approximation following the literature (Machado and Mata, 2005; Melly, 2006). Hence, we simply arrange the predicted values for a large number of equispaced quantiles and all individuals and then take the τth sample quantile of this augmented sample. This assumes that the conditional distribution $F_{female}(q|X_j)$ can be approximated by a discrete uniform distribution on the set of equispaced quantiles. Concretely, we estimate 49 equispaced quantile regressions starting at the 2%–quantile.[6] We use this technique to decompose the gender wage gap for each of the bargaining regimes separately, as well as for the total

[5] Variation of the coefficient on the constant is already captured by $\beta^m(\tau)$ and $\beta^f(\tau)$.

[6] Instead of treating τ as a uniformly distributed random variable on $[0, 1]$, τ is treated as uniformly distributed on the 49 even percentiles. This way, we avoid estimation for all M possible cases, where M can be very large in applications like ours.

wage distribution. In the next version of this paper we try to extend our decomposition to separate personal from firm characteristics. Therefore, in order to assign an employee in 2006 job characteristics from 2001, we will apply a matching procedure. Finally, in order to separate the effect of deunionization we seek to simulate a counterfactual wage distribution as if the composition of firms with respect to the wage bargaining regime had remained constant.

4 Data

We use the German Structure of Earnings Survey (GSES; "Gehalts- und Lohnstrukturerhebung") from 2001 and 2006, which is a large mandatory repeated cross sectional linked employer-employee data set. This study is the first to use the cross-section from 2006. Thanks to the linkage of employer-specific with employee data and to its large size, this data allows for detailed analysis of the wage structure by controlling for some unobservable institutional heterogeneity (Drolet and Mumford, 2009). Moreover, even though the sampling design asks firms to provide data only on a fraction of their workforce, many firms in 2006 prefer to supply data on all employees, thereby increasing the data quality. The data is based on a random sample of all German firms with at least ten employees in all sectors of the economy but focusing on the private sector. Sampling weights are provided to be able to make the sample representative for all employees in the included industries.

Thus, the advantages of using the GSES data are its size and reliability. Furthermore, it provides precise information on whether an employee is covered by a bargaining regime, and if so, under which type (general or firm-specific collective bargaining agreement).[7,8] It is also of great advantage that in contrast to the IAB linked employer-employee data set (LIAB), wages are neither truncated nor censored so that the entire wage distribution can be taken into account (Kohn and Lembcke, 2007). Finally, contrary to the LIAB, information is provided on the individual and not exclusively on the firm-level. Due to these advantages this data set has also been used by Stephan and Gerlach (2005); Gerlach and Stephan (2005a,b) and Fitzenberger and Reize (2002) to analyze the German wage

[7]Following Burda et al. (2008) we define a covered employee as anybody working in a covered establishment, i.e. an establishment that pays at least some employees a collectively bargained wage (taking 10% coverage within the firm as a lower bound). The reason is that most of those employees working in such an establishment and not being covered in an administrative sense still profit directly from the presence of unions, as they are paid more than the other (covered) employees in that establishment ("übertarifliche Bezahlung" as opposed to "außertarifliche Bezahlung", cf. Fitzenberger et al., 2008). The negotiated wages in the collective agreements thus act as a minimum wage from which also the non-covered individuals benefit. Another nice feature of this definition is that it makes our study better comparable to Anglo-Saxon countries.

[8]In the following empirical analysis the firm bargaining regime is defined to comprise plant-specific contracts as there are only very few of the latter.

structure and more specifically by Heinbach and Spindler (2007) and Fitzenberger et al. (2008) who focus on the union wage premium.

The focus in this study is on the prime aged work force in West Germany, we drop employees who are currently in vocational training or do an internship as well as all employees younger than 25 or older than 55 years of age.[9] Given the regional heterogeneity found by Kohn and Lembcke (2007), we focus on West Germany rather than Germany. In addition, we limit the sample to full-time workers, i.e. those who get paid at least 30 hours including overtime in October 2001 or 2006.[10] Finally, we are forced to drop the education and health sector in 2006, as they were not included in the 2001 cross-section.[11] The final sample involves 420,000 employees in some 17,000 firms in 2001 and 830,000 employees in 22,600 establishments in 2006. We consider two groups in our analysis: full-time working males and females in West Germany.

The wage is defined as October earnings including overtime pay, but excluding bonuses for Sunday or shift work, divided by hours paid in October including overtime hours. For plausibility, we limit the hourly wage to values between 4 and 70 euro per hour (both correspond to less than 1% of the wage distribution). We deflate the 2006 wages to the price level in 2001 by using the CPI of the federal statistical office in order to consider only real wages. As outcome variable we use the log gross real hourly wage.

Further descriptive statistics on the variables used for our decomposition analysis can be found in the appendix in tables 8 and 9. From there it can be seen that employees working in establishments without collective contracts are the youngest group and have on average the lowest tenure. Moreover, employees under firm-specific bargaining, and in particular men, very often worked extra shifts involving additional bonuses. Finally, mainly small firms drop out of the sectoral wage bargaining regime.

5 Empirical results

5.1 Wages

From 2001 to 2006 there have been some notable changes in the wage distribution (cf. table 1): Below the median, for both, males and females, real hourly wages dropped, whereas they remained constant at the median and increased for the quantiles above the median, leading to an overall increase in wage dispersion. Considering the interquartile

[9] Note that the participation rate is high among this group, we thus arguably avoid at least some of the problems stemming from self-selection effects.

[10] Sohr and Stephan (2005) also use 30 contractual working hours per week as a minimum requirement to be declared full-time worker and thus included in the analysis. However, they further add a requirement of 100 working hours per month.

[11] As a result of this, along with the fact that small firms with less than 10 employees are not included in the GSES, our study is not representative for all workers in West Germany.

Table 1: Real log wage distribution by quantiles

	2001		2006		Δ 2006-2001		GWG		Δ GWG
τ	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**2001**	**2006**	
10%	2.44	2.19	2.35	2.12	-0.09	-0.07	0.25	0.23	-0.02
25%	2.61	2.40	2.56	2.36	-0.05	-0.04	0.21	0.20	-0.01
50%	2.82	2.62	2.82	2.61	0.0	0.0	0.20	0.21	0.01
75%	3.08	2.86	3.11	2.88	0.03	0.03	0.22	0.22	0.00
90%	3.35	3.09	3.38	3.13	0.03	0.04	0.26	0.25	-0.01

range of log-wages as a measure for wage dispersion, males in West Germany experienced an increase in wage dispersion of 8 percentage points (pp), while female employees experienced an increase in wage dispersion of 6 pp. Considering the 90-10 difference in log-wages as a measure for wage dispersion, the increase between the two considered periods gets even larger (12 pp for males, 11 pp for women). Table 1 further shows that the increases in wage dispersion are driven mainly by real wage losses in the lower part of the wage distribution and to a lesser extent by wage increases in the upper part.

5.2 Gender Wage Gap

Considering the (unconditional) gender wage gap, it amounts to about 25% at the upper and lower end of the distribution for West Germany and 20% at the median (cf. table 1 and figures 1 and 2). In the lower part of the wage distribution women were able to gain most relative to men. Overall it can be seen from the graph that female relative earnings have increased from 2001 to 2006 in Germany – except between the 45^{th} and 83^{rd} percentile. Finally an overall U-shape pattern of the gender wage gap is observed, which is prima face evidence not only of the well-known "glass-ceiling" effect, but also of a so-called "glass floor" effect for low wage female employees.

5.2.1 Gender Wage Gap by education

When considering the gender wage gap by educational level, first note that it increases with higher levels of education (cf. table 2). For employees with low education, the gender wage gap displays an inverted U-shape. Over time, the gender wage gap for this group decreases at all observed quantiles. In contrast, for medium educated employees the gender wage gap exhibits a U-shape in 2001, but after a worsening in the middle of the distribution it flattens somewhat in 2006. Still, there remains strong indication for a "glass floor" which is also observable in the group of highly educated employees. For this group, the gender wage gap, which does not follow a clear pattern, increases over time at and below the median. Hence, over time, relative wages rose most strongly for

Table 2: Gender Wage Gap by education

	2001			2006			Δ 2006-2001		
τ	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**
10%	0.19	0.22	0.26	0.16	0.21	0.28	-0.03	-0.01	0.02
25%	0.21	0.19	0.23	0.20	0.17	0.25	-0.01	-0.02	0.02
50%	0.20	0.17	0.24	0.17	0.19	0.25	-0.03	0.02	0.01
75%	0.18	0.17	0.22	0.18	0.18	0.22	0.00	0.01	0.00
90%	0.16	0.20	0.20	0.15	0.19	0.19	-0.01	-0.01	-0.01

Table 3: Individual coverage rates

	2001		2006		Δ2006-2001	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
No Coll. Barg.	29.0	33.2	45.9	52.9	16.9	19.7
Industry-wide Barg.	62.8	59.2	46.2	40.4	-16.6	-18.8
Firm-level Barg.	8.2	7.6	7.9	6.7	-0.3	-0.9

low-educated women, whereas medium and high educated employees experienced relative gains as well as losses at different parts of the distribution.

5.3 Coverage

In line with well-known international trends (Card et al., 2003), collective bargaining coverage fell in Germany between 2001 and 2006, as table 3 shows. Distinguishing between industry-wide and firm-specific collective bargaining the decreases have been larger in the former compared to the latter bargaining regime (in absolute as well as in relative terms). While industry-wide collective bargaining covered about 60% of the workforce in 2001, this share plummeted to 46.2% for males and to 40.4% for females in 2006. At the same time, coverage rates under a firm agreement decreased from 8 to 7%, and the decline is stronger for females than for males. As a result, in 2006 about half of the workforce considered in our data set is not covered by collective agreements, anymore, and the decline is stronger for women compared to men. Table 4 confirms that men are overrepresented in the two types of collective bargaining regimes. However, nothing can be said about the employee- and firm-specific dynamics of the different bargaining regimes, as the data from 2001 and 2006 cannot be joined to form a panel. It is possible that firm-specific bargaining constitutes an intermediate step for some employers, as it allows more flexibility than an industry-wide agreement, but still less than individual contracts. It is possible that in the quest for more flexibility some employers switch from collective to firm-specific bargaining while others switch from firm-specific to no collective bargaining.

Table 4: Shares of males and females in different bargaining regimes

	2001		2006	
	Male	**Female**	**Male**	**Female**
No Coll. Barg.	72.4	27.6	72.2	27.8
Industry-wide Barg.	76.1	23.9	77.4	22.6
Firm-level Barg.	76.5	23.5	78.0	22.0
Total	75.0	25.0	75.0	25.0

5.4 Wages in the different bargaining regimes

There are notable differences in wage levels and wage trends by bargaining regime and gender (cf. table 5 and figures 4, 7 and 10).

For *West German males*, highest wages are paid over the entire distribution in the firm- or plant-specific bargaining regime in 2001 as well as in 2006. The difference to the wage distribution of the industry-wide collective bargaining regime is more pronounced in the upper part. The later regime clearly first-order stochastically dominates the wage distribution of uncovered employees, i.e. at all quantiles wages are higher for those paid under sectoral agreements (Burda et al., 2008). Male employees in the sectoral bargaining regime and in the regime with no collective contract experience real wage losses below the median (-7% at the 10^{th} percentile), while employees at and above the median in each bargaining regime display real wage gains between 2 and 4%. Moreover, employees covered by a firm-specific contract experienced the largest gain with up to 13% and only small real wage losses at the very bottom of the wage distribution.

In contrast, the real wage distribution for *West German females* without collective bargaining shifted upwards by 0 to 2% at the bottom of the wage distribution and 3 to 4% at the median and above. For female employees under industry-wide collective bargaining, real wage losses are experienced by those at the very bottom of the wage distribution, however, increases above the 10% quantile are more pronounced for females compared to their male counterparts in this bargaining regime. Strikingly, there have been large losses at the lower end of the wage distribution for women under firm-specific contracts (-16% at the first decile and -7% at the lower quartile), which are nevertheless accompanied by wage increases on the order of 12% at the upper end and still of 7% at the median. However, as firm-specific bargaining only applies to about 7% of West German females in 2006, the contribution of this development to the overall increase in wage dispersion is small.

Furthermore, as can be inferred from table 5, in 2001 the wage dispersion was largest in the regime without collective bargaining, both as measured by the difference between the 90% and the 10% quantile as well as by the interquartile range. This holds for women as well as for men. To the contrary, in 2006 the picture is less clear. It still holds that

Table 5: Wages in the different bargaining regimes

τ	2001		2006		Δ2006-2001	
	No Collective Bargaining					
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
10%	2.30	2.08	2.27	2.08	-0.03	0.00
25%	2.48	2.26	2.47	2.28	-0.01	0.02
50%	2.69	2.49	2.71	2.51	0.02	0.02
75%	2.97	2.77	3.01	2.80	0.04	0.03
90%	3.29	3.04	3.33	3.08	0.04	0.04
	Sectoral Bargaining					
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
10%	2.51	2.29	2.44	2.23	-0.07	-0.06
25%	2.67	2.46	2.65	2.47	-0.02	0.01
50%	2.86	2.66	2.89	2.70	0.03	0.04
75%	3.11	2.89	3.14	2.94	0.03	0.05
90%	3.36	3.10	3.39	3.15	0.03	0.05
	Firm Bargaining					
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
10%	2.52	2.31	2.51	2.15	-0.01	-0.16
25%	2.67	2.49	2.71	2.42	0.04	-0.07
50%	2.88	2.66	3.01	2.73	0.13	0.07
75%	3.15	2.91	3.28	3.03	0.13	0.12
90%	3.43	3.16	3.51	3.27	0.08	0.11

wage dispersion is always larger for those employees working in a regime without collective bargaining compared to those covered by sectoral agreements, but the interquartile range is now even larger for those working under a firm-specific agreement.

Overall we conclude that large differences persist within and between the different bargaining regimes as well as between males and females. The main feature which all of these groups share is the move towards more flexible wage arrangements implying higher wage dispersion for all groups of employees.

5.5 Gender wage gaps in the different bargaining regimes

We have seen that the unconditional gender wage gap only shrank to a minor degree in the lower part of the wage distribution, whereas it remained almost constant in the region above the median. This is partly due to the composition effect with respect to the different bargaining regimes, i.e. the decline in collective bargaining coverage. Therefore the gender wage gap in the different bargaining regimes in West Germany is now considered. In 2001 the gender wage gap was highest for employees who were paid under a firm-specific agreement for the upper part of the wage distribution, while in the lower part the wage differential is somewhat higher in the two other bargaining regimes (cf. table 6 and figure 3). The gender wage gap decreased between 2001 and 2006 for the sectoral agreement (cf. figure 9), and for the lower part of the distribution without col-

Table 6: Gender wage gaps distribution in different bargaining regimes

	2001			2006			Δ 2006-2001		
τ	No Coll. Barg.	Sectoral Barg.	Firm Barg.	No Coll. Barg.	Sectoral Barg.	Firm Barg.	No Coll. Barg.	Sectoral Barg.	Firm Barg.
10%	0.22	0.22	0.21	0.19	0.21	0.36	-0.03	-0.01	0.15
25%	0.22	0.21	0.18	0.19	0.18	0.29	-0.03	-0.03	0.11
50%	0.20	0.20	0.22	0.20	0.19	0.28	0.00	-0.01	0.06
75%	0.20	0.22	0.24	0.21	0.20	0.25	0.01	-0.02	0.01
90%	0.25	0.26	0.27	0.25	0.24	0.24	0.00	-0.02	-0.03

lectively negotiated contracts (cf. figure 6), while it remained constant in the upper part. It increased dramatically in the lower half of the wage distribution under firm-specific agreement (cf. figure 12). Due to those particular changes, in 2006 the largest gender wage gap can be observed for employees working under a firm-specific agreement. It is remarkable that the gender wage gap is also higher for employees who are not paid under a collective contract compared to those paid under a sectoral agreement at almost every point of the wage distribution, as can be also infered from figure 3. Note that all these are purely descriptive results and we do not claim causality, as we do not control for selection into the different bargaining regimes.[12]

Next we look in more detail at the gender wage gap distribution for individuals in different bargaining regimes and its decomposition into a part explained by characteristics and a part explained by coefficients (usually called "unexplained part" or "price effect"; cf. figures 6, 9, and 12 and tables 10 to 15 in the appendix).[13]

For individuals not covered by a collective agreement the gender wage gap in 2001 is rather stable up to the upper quartile, but increasing notably above that point. From 2001 to 2006 there is a remarkable decrease in the gender wage gap in the lower half of this wage-distribution. Recalling the large dynamics of firms and individuals moving from industry-wide to individual coverage implies that this decrease of the gender wage gap could be partly due to firms which move between the regimes, but continue to stick to non-discrimination as implied (formerly) by industry-wide bargaining agreements. Strikingly, as can be inferred from figure 6, the better relative positions of women in the lower part are explained by an improvement in coefficients, which are often interpreted as prices, whereas the rising contribution of the characteristics counteracted the decrease of the gender wage gap in this part. Above the median, the overall gender wage gap as well as the part explained by the coefficients and the characteristics remained surprisingly stable.

For individuals covered by industry-wide agreements the gender wage gap is exhibiting

[12]Nor do we control for occupational choice. The selection into bargaining regimes is a difficult issue, we leave this point open for further research. As we control for both personal and firm effects, though, we take care of some of the endogeneity problem stemming from the selection process.

[13]Due to computing constraints, some of the bootstrapped clustered standard errors for the decomposition are still missing, which will be provided in the next version of our paper.

a U-shaped pattern in both years, but rather flat within the inter-quartile range, supporting the "glass-ceiling" hypthesis (de la Rica et al., 2008). Over time, the gender wage gap is decreasing over the entire wage distribution by between 1 and 3 percentage points. The following decomposition results are very similar to the development for employees without collective bargaining coverage seen above: While in 2001 the part of the gender wage gap explained by coefficients is greater than the part explained by characteristics over the entire distribution, this relation is inverted for the lower part of the distribution in 2006, while staying rather stable for the part above the median (cf. figure 9). That means that in the lower part differences in the coefficients, i.e. price discrimination, developed favorably for women whereas the differences in characteristics explain a larger share of the gender wage gap. The decrease of the gender wage gap in the lower part of the distribution is driven by real wage losses over time, which are more pronounced for male compared to female employees. Note that during this period, a strong movement of firms and individuals out of industry-wide bargaining towards non-coverage took place, so that there are obviously strong composition effects at play changing the composition of the groups of covered and uncovered employees and firms.

Looking closer at employees who work under a *firm-specific contract* we observe that considerable changes took place between 2001 and 2006, as can be seen in figures 10 to 12. For this group, the gender wage gap almost doubled at the lower end, whereas women in the upper quartile experienced considerable relative gains. As can be inferred from the decomposition, the drop in female relative earnings is driven by a large increase in the importance of characteristics. In particular, the composition of industries has seen some important changes, which could explain this result: The telecommunication sector gained a lot of importance for females and less so for males. In 2006, one out of four women who work under a firm-specific contract does so in the telecommunication sector, while only 13% of male employees do so. The relative importance of the car manufacturing sector rose strongly for males up to 31% in 2006, while for women this sector is less important. Other sectors in which unequal shifts for male and female employees took place include e.g. the manufacturing of machinery and equipment. This might help to explain why there have been unequal developments between the male and female wage structure for those covered by firm-specific contracts. We will further investigate these changes in order to better understand what drives the dramatic changes in the wage structure of those employees. Finally we also observe that fewer female employees are covered by a firm-specific contract in 2006 compared to 2001, whereby especially women working in rather large establishments seem to be affected of this decline. It is often observed that larger establishments pay higher wages. If this is the case, the non-uniform drop of firm contracts over the distribution of firm size may be another explanation for the movements that we observe in the wage distribution for individuals covered by these agreements.

However, one has to keep in mind that the development within this bargaining regime is only relevant for very few employees.

In conclusion, the two largest groups, namely sectoral and no collective bargaining, display improvements in the lower part of the gender wage gap distribution, which are attributed to a reduced price discrimination (i.e. reduced importance of coefficients) but partly offset by an increasing importance of characteristics. The decrease in the gender wage gap over time in the industry-bargaining regime and the parallel worsening in parts of the gender wage gap distribution for individuals without collective bargaining coverage can have two potential explanations: First, unions are working towards a reduction of the gender wage gap and therefore the trend towards lower coverage has prevented the gender wage gap from declining even further. Second, the changes in the relative earnings of females in the different bargaining regimes could be due to a composition effect: if strongly discriminating firms drop out of collective wage bargaining and less discriminating firms remain in it, then the gender wage gap drops in the collective bargaining regime due to this change in composition. However, a priori we do not have reason to believe that the decision of a firm of changing from being covered to being uncovered is systematically correlated to the size of the gender wage gap within that firm. Therefore we tend towards the first interpretation.

6 Conclusions

This paper investigates as to whether and to what extent the recent increase in wage inequality between 2001 and 2006 can be related to the decline in wage bargaining. In particular, we focus on changes of the gender wage gap. This is the first study to use the latest available cross-section of the German Structure of Earnings Survey for 2006 and to compare it to the cross-section for 2001. By applying a quantile regression framework, we analyze the gender wage differences over the entire wage distribution and not only at the mean. In order to apportion the gender wage gap into those effects stemming from characteristics and from price effects, we employ the decomposition techniques proposed by Machado and Mata (2005) and Melly (2006) within each bargaining regime.

Confirming the expectation we find that wage dispersion is rising, driven not only by wage increases at the top of the wage distribution, but also by real wage losses below the median. We find an increase in wage dispersion both for the entire samples of males and females, and by bargaining regime. Regarding union coverage, we find that not only the share of employees under an industry-wide collective contract but also the share of individuals covered by a firm-level contract declined sharply. As a result, in 2006 only little more than half of West German employees are still covered by a collective bargaining agreement. Despite those large changes, the gender wage gap remained nearly unchanged

between 2001 and 2006 in the upper part of the West German wage distribution, whereas below the median women were able to gain relative to men to some extent. Furthermore we find that the gender wage gap widened for highly educated women, while it declined for low-skilled women and for those medium-skilled women at the bottom of the wage distribution. Moreover, in 2006 women seem to benefit relative to men from being covered by collective bargaining, as for those women the gender wage gap is smallest compared to the gender wage gap for women not covered at all. In 2001 however, the picture is less clear. The decline in coverage thus seems to have counteracted a further decline of the gender wage gap. The decomposition results reveal that the gains in the lower part stem in parts from a favorable development of the coefficients for women, which we interpret as prices, i.e. we observe a reduction in price discrimination. At the same time, an increased importance of characteristics partly counteracted the improvement in women's relative earnings.

Our results highlight the importance of using linked employer-employee data in order to control for worker as well as firm characteristics when analyzing wage differences. Moreover, it proves very important to take the entire distribution of wages and of the wage differential into account, as we do by applying a quantile regression framework. Unfortunately, our estimations and decompositions cannot take account of the apparent endogeneity of collective bargaining coverage, and so the results should not be interpreted as causal effects. However, the endogeneity problem is reduced by controlling for both individual and firm characteristics.

In the next version of this paper we are planning to decompose the gender wage gap not only into a coefficients and a characteristics part, but further differentiate between personal and firm characteristics which will require the use of a matching procedure. Finally, we seek to simulate a counterfactual wage by variation of the wage bargaining regime in order to extract the effect of deunionization. This should help to better understand the development of relative female earnings over time and to partly capture the endogeneity with respect to the choice of bargaining regime. We hope that this brings us closer to the hypothesized causal impact of unions on the gender wage gap.

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Appendix

Figure 1: Overall gender wage gap

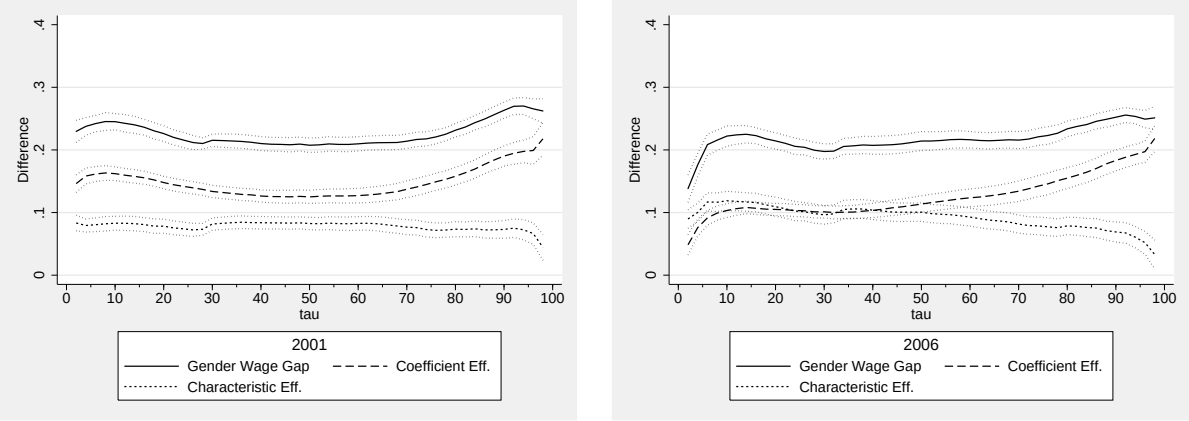

Figure 2: Log-wages of males and females and development of gender wage gap: 2006 - 2001

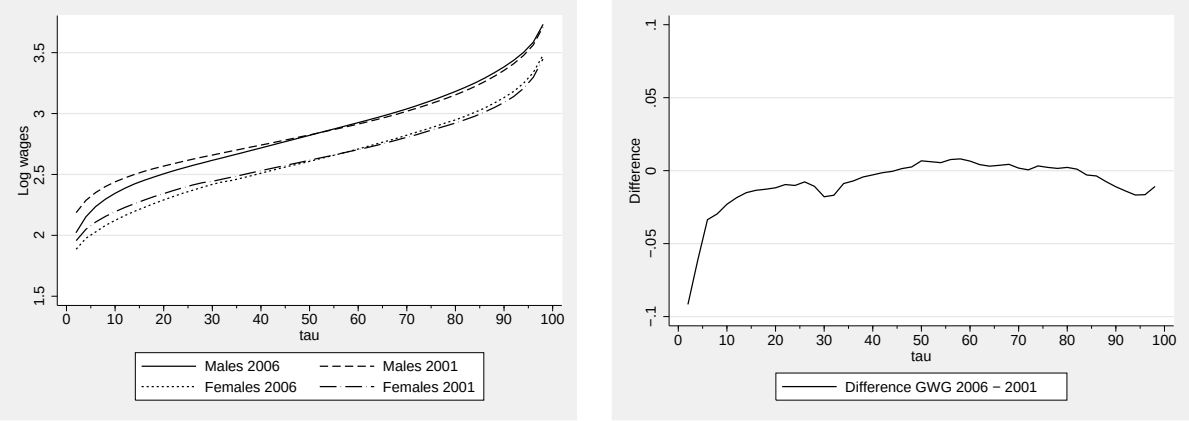

Figure 3: Gender wage gap in different bargaining regimes

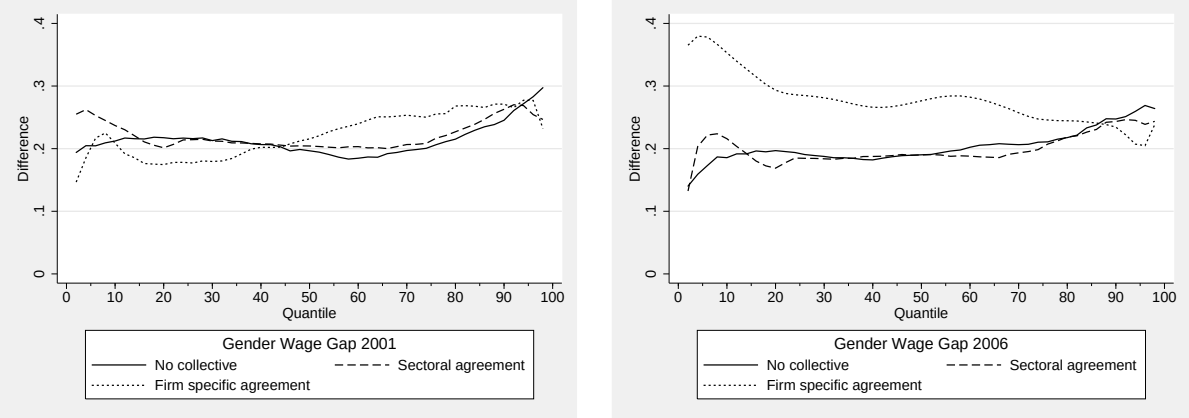

Figure 4: Unconditional log-wages and gender wage gap: Without collective bargaining

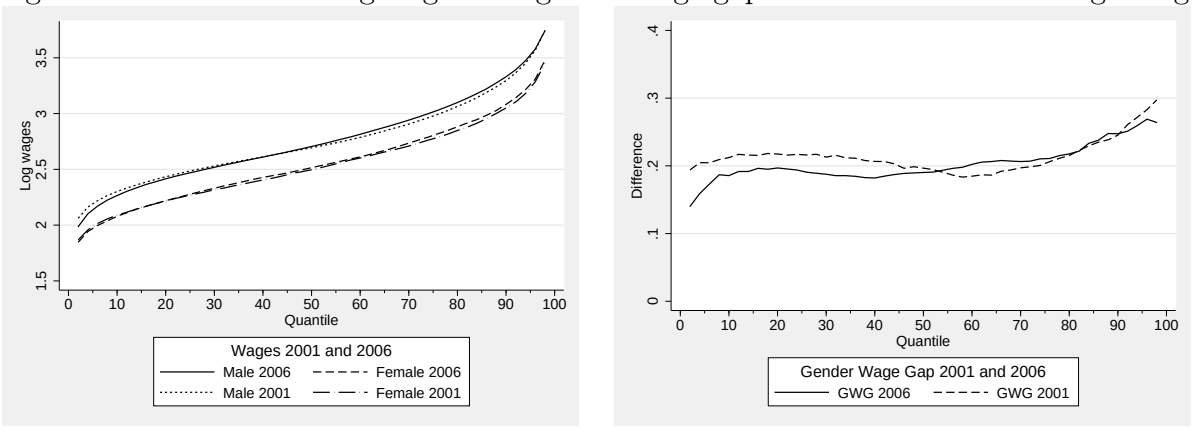

Figure 5: Male, female, and counterfactual log-wages: Without collective bargaining

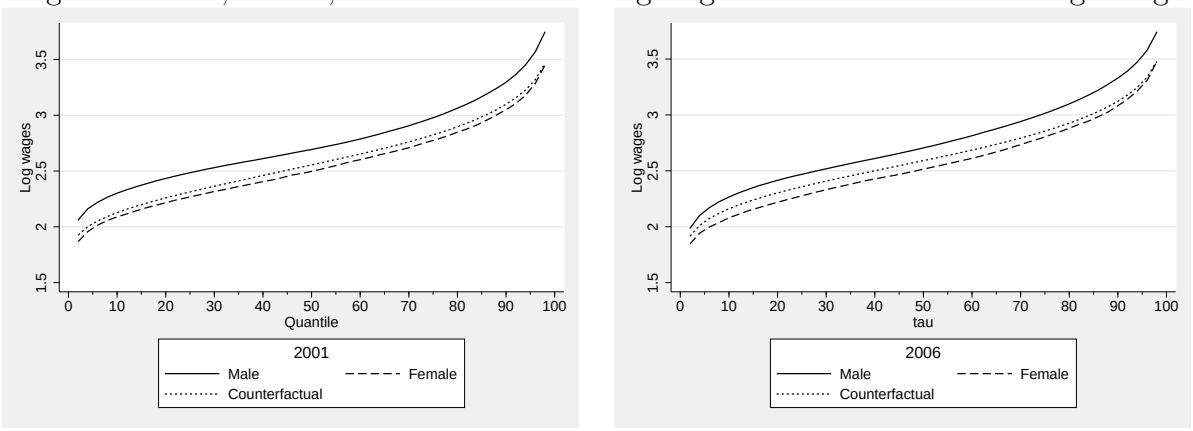

Figure 6: Gender wage gap and decomposition: Without collective bargaining

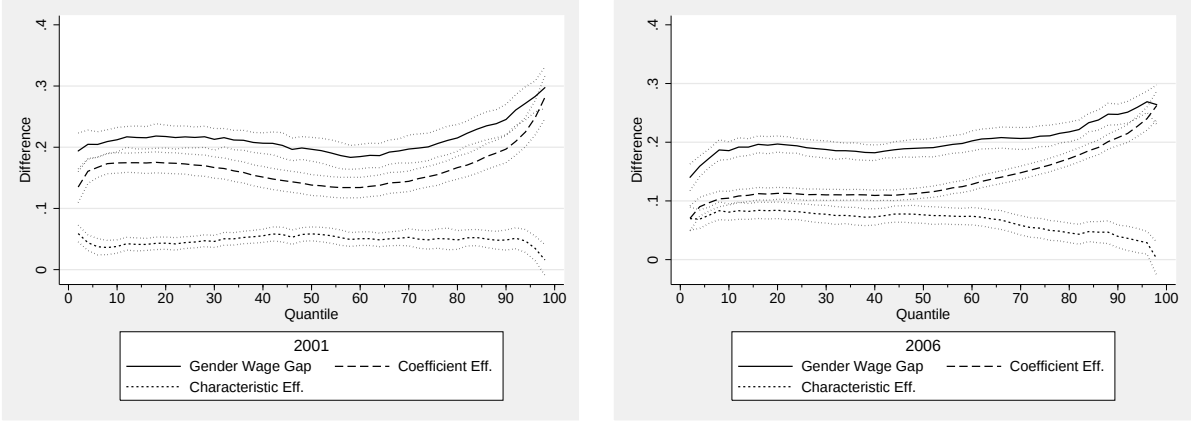

Figure 7: Unconditional log wages and gender wage gap: Sectoral agreements

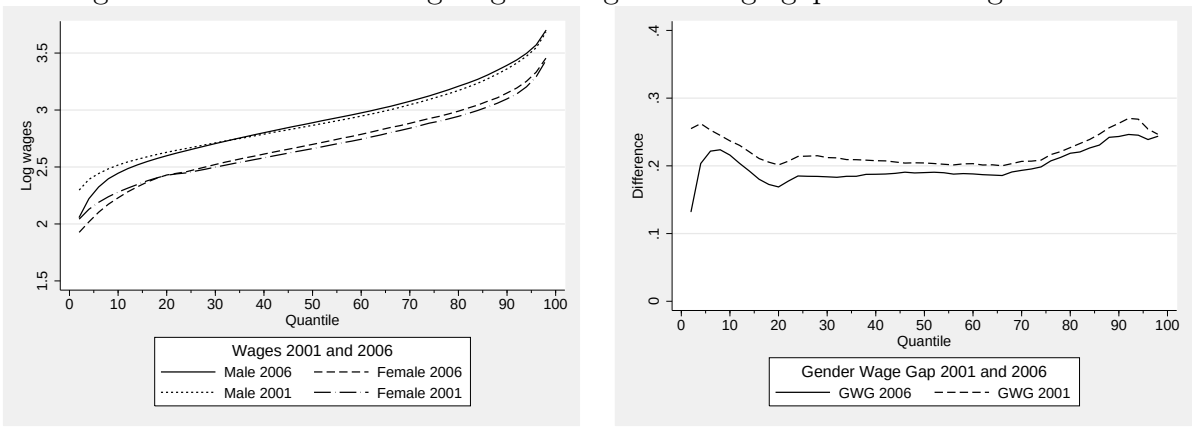

Figure 8: Male, female, and counterfactual log-wages: Sectoral agreements

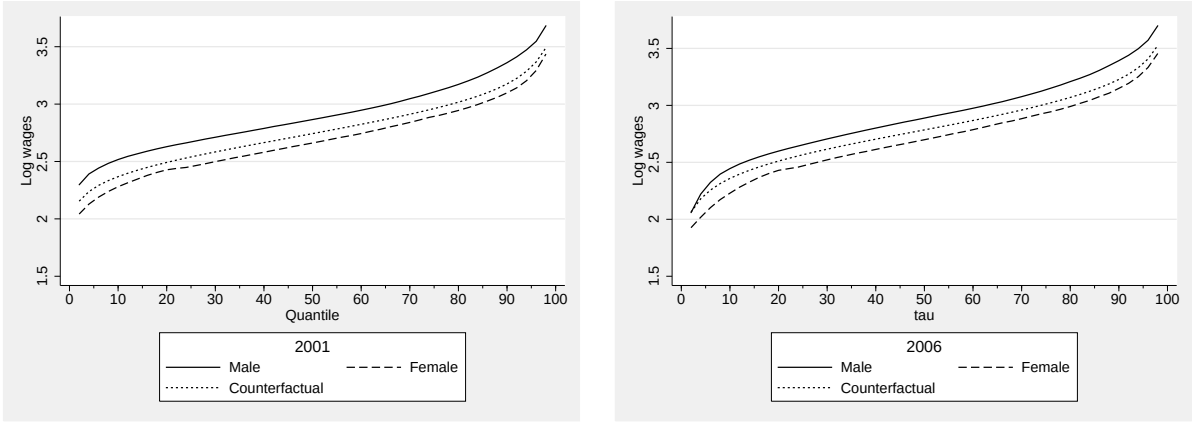

Figure 9: Gender wage gap decomposition: Sectoral agreements

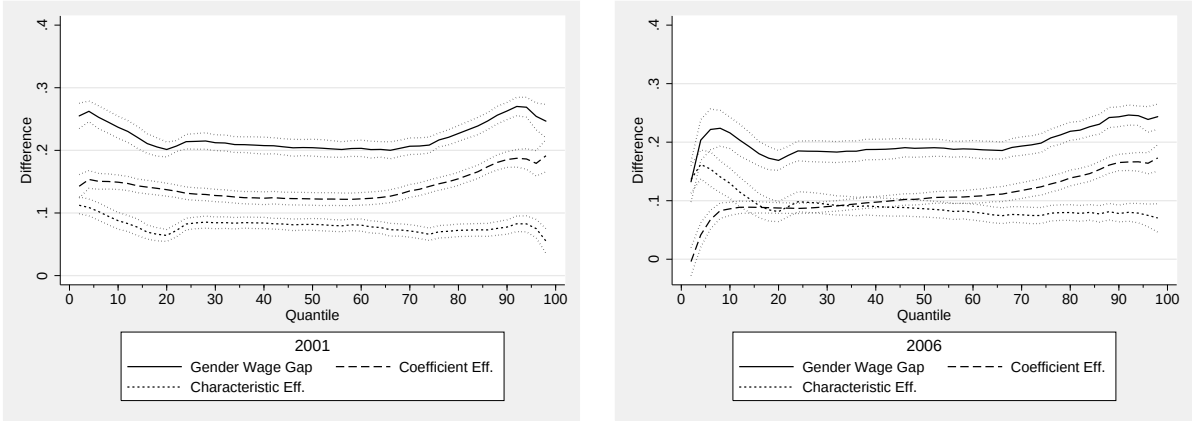

Figure 10: Unconditional log-wages and gender wage gap: Firm agreements

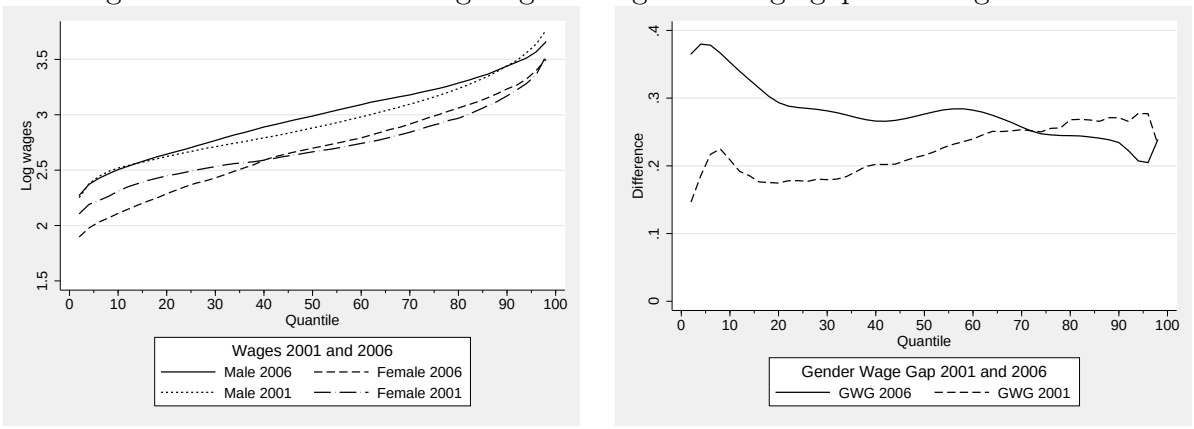

Figure 11: Male, female, and counterfactual log-wages: Firm agreements

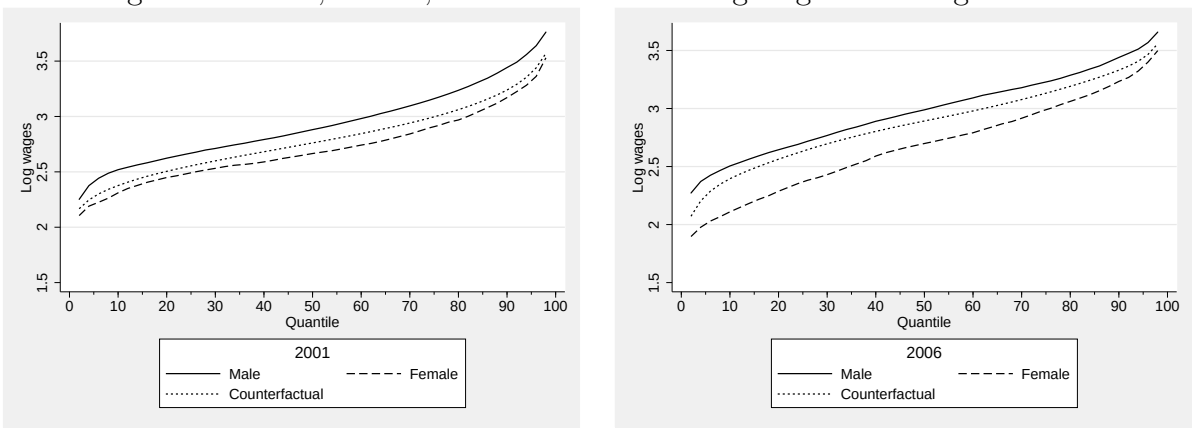

Figure 12: Gender wage gap decomposition: Firm agreements

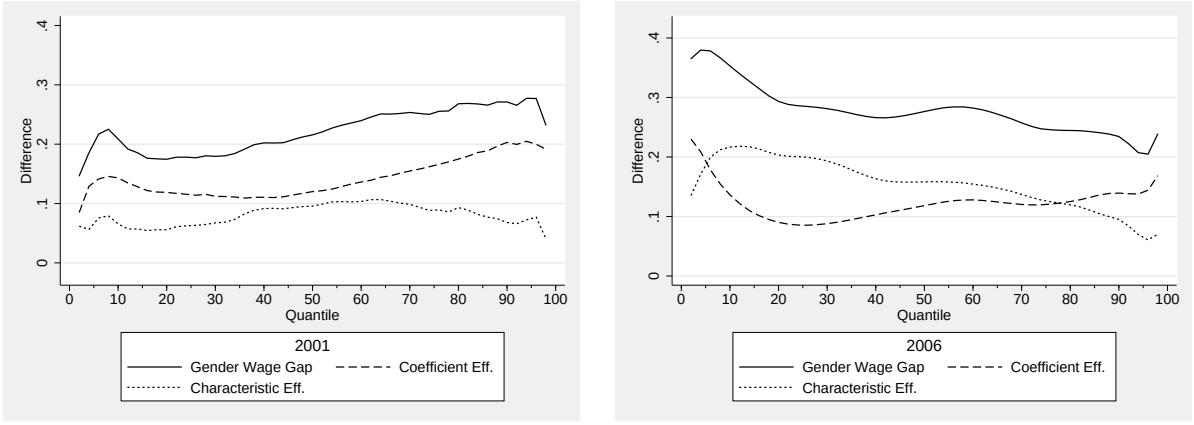

Table 7: Definition of Variables

Label	Description
Individual level	
AGE	Age in years
AGESQ	AGE squared
TENURE	Tenure in years
TENURESQ	TENURE squared
LOW_EDUC	Low level of education: no training beyond a school degree
MED_EDUC	Intermediate Level of education: vocational training
HIGH_EDUC	High level of education: university or university of applied sciences
NA_EDUC	Missing information on the education level
AGE_LOW	Indicator variable for low education interacted with age
AGE_MED	Indicator variable for medium education interacted with age
AGE_HIGH	Indicator variable for high education interacted with age
AGE_NA	Indicator variable for not available education interacted with age
EXTRA	Individual worked night shifts, overtime, on Sundays or on holidays
Firm level	
REGION1	Firm is located in Schleswig Holstein or Hamburg
REGION2	Firm is located in Lower Saxony or Bremen
REGION3	Firm is located in North Rhine-Westphalia
REGION4	Firm is located in Hesse
REGION5	Firm is located in Rhineland-Palatinate or Saarland
REGION6	Firm is located in Baden-Württemberg
REGION7	Firm is located in Bavaria
FIRMSIZE1	Firm has between 10 and 99 employees
FIRMSIZE2	Firm has between 100 and 199 employees
FIRMSIZE3	Firm has between 200 and 999 employees
FIRMSIZE4	Firm has between 1000 and 1999 employees
FIRMSIZE5	Firm has between 2000 and 9999 employees
PUBLIC	Firm is mainly public-owned (>50%)
S_FEM	Share of female employees
S_NOT_FT	Share of employees who work not full-time
SECTOR1	Mining and quarrying
SECTOR2	Manufacture of food products, beverages and tobacco
SECTOR3	Manufacture of textile and textile products, leather and leather products
SECTOR4	Manufacture of wood and wood products
SECTOR5	Publishing, printing and reproduction of recorded media
SECTOR6	Manufacture of coke, refined petroleum products and nuclear fuel; chemicals and chemical products
SECTOR7	Manufacture of rubber and plastic products
SECTOR8	Manufacture of other non-metallic mineral products
SECTOR9	Manufacture of basic metals; fabricated metal products, except from machinery and equipment
SECTOR10	Manufacture of machinery and equipment
SECTOR11	Manufacture of electrical machinery and apparatus
SECTOR12	Manufacture of electrical and optical equipment; radio, television, and communication equipment and apparatus
SECTOR13	Manufacture of medical, precision and optical instruments, watches and clocks
SECTOR14	Manufacture of transport equipment
SECTOR15	Manufacture n.e.c.
SECTOR16	Electricity, gas and water supply
SECTOR17	Construction
SECTOR18	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
SECTOR19	Wholesale trade and commission trade except of motor vehicles and motorcycles
SECTOR20	Retail trade, except from motor vehicles and motorcycles; repair of personal and household goods
SECTOR21	Hotels and restaurants
SECTOR22	Land transport; transport via pipelines; air transport
SECTOR23	Water and air transport (collapsed with SECTOR 24 in 2006)
SECTOR24	Supporting and auxiliary transport activities; activities of travel agencies
SECTOR25	Post and telecommunications
SECTOR26	Financial intermediation, except from insurance and pension funding; activities auxiliary to financial intermediation, except from insurance and pension funding
SECTOR27	Insurance and pension funding, except compulsory social security; activities auxiliary to insurance and pension funding
SECTOR28	Real estate activities; renting of machinery and equipment without operator and of personal and household goods
SECTOR29	Computer and related activities
SECTOR30	Other services
SECTOR31	Other real estate activities
SECTOR33	Research and Development
SECTOR34	Other business activities

Table 8: Descriptive statistics: males

Label	No collective agreement				Sectoral Bargaining				Firm Bargaining			
	2001		2006		2001		2006		2001		2006	
	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.
Individual level												
Age	38.75	(7.93)	39.96	(7.99)	40.00	(8.04)	41.18	(7.97)	39.92	(8.06)	41.50	(7.73)
Age squared	1564	(632.3)	1660	(640.8)	1665	(650.6)	1759	(648.3)	1658	(652.4)	1782	(632.3)
Tenure	6.60	(7.36)	8.17	(7.90)	11.52	(9.40)	12.56	(9.61)	11.92	(9.55)	14.60	(9.47)
Tenure squared	97.79	(195.4)	129.3	(225.4)	221.1	(298.1)	250.1	(313.2)	233.2	(309.6)	302.7	(322.5)
Low education	0.13	(0.34)	0.12	(0.32)	0.15	(0.35)	0.13	(0.34)	0.15	(0.35)	0.11	(0.32)
Medium education	0.62	(0.49)	0.60	(0.49)	0.70	(0.46)	0.70	(0.46)	0.71	(0.45)	0.66	(0.48)
High education	0.11	(0.32)	0.12	(0.32)	0.11	(0.32)	0.13	(0.33)	0.11	(0.32)	0.17	(0.37)
Education n/a	0.13	(0.34)	0.17	(0.37)	0.04	(0.20)	0.05	(0.21)	0.03	(0.17)	0.06	(0.24)
Extra shifts	0.16	(0.36)	0.21	(0.40)	0.31	(0.46)	0.33	(0.47)	0.45	(0.50)	0.44	(0.50)
Firm level												
REGION1	0.09	(0.28)	0.07	(0.25)	0.05	(0.21)	0.05	(0.22)	0.05	(0.21)	0.07	(0.25)
REGION2	0.10	(0.29)	0.10	(0.29)	0.11	(0.31)	0.11	(0.31)	0.27	(0.44)	0.26	(0.44)
REGION3	0.26	(0.44)	0.28	(0.45)	0.30	(0.46)	0.29	(0.45)	0.21	(0.41)	0.18	(0.38)
REGION4	0.11	(0.31)	0.11	(0.31)	0.09	(0.28)	0.09	(0.29)	0.09	(0.29)	0.11	(0.31)
REGION5	0.06	(0.24)	0.06	(0.23)	0.08	(0.27)	0.08	(0.26)	0.05	(0.22)	0.04	(0.19)
REGION6	0.22	(0.41)	0.20	(0.40)	0.19	(0.40)	0.19	(0.39)	0.13	(0.34)	0.09	(0.29)
REGION7	0.17	(0.38)	0.20	(0.40)	0.19	(0.39)	0.20	(0.40)	0.20	(0.40)	0.26	(0.44)
FIRMSIZE1	0.52	(0.50)	0.51	(0.50)	0.55	(0.50)	0.20	(0.40)	0.51	(0.50)	0.11	(0.31)
FIRMSIZE2	0.13	(0.34)	0.15	(0.36)	0.11	(0.32)	0.12	(0.33)	0.13	(0.34)	0.07	(0.25)
FIRMSIZE3	0.22	(0.42)	0.22	(0.42)	0.22	(0.41)	0.32	(0.47)	0.23	(0.42)	0.27	(0.44)
FIRMSIZE4	0.04	(0.20)	0.04	(0.19)	0.04	(0.20)	0.12	(0.33)	0.04	(0.20)	0.10	(0.30)
FIRMSIZE5	0.08	(0.28)	0.08	(0.27)	0.08	(0.27)	0.24	(0.43)	0.09	(0.29)	0.46	(0.50)
PUBLIC	0.06	(0.23)	0.01	(0.10)	0.05	(0.23)	0.06	(0.23)	0.08	(0.26)	0.13	(0.33)
S_MALE	0.66	(0.25)	0.73	(0.19)	0.65	(0.25)	0.77	(0.18)	0.64	(0.25)	0.78	(0.17)
S_NOT_FT	0.10	(0.13)	0.12	(0.14)	0.07	(0.11)	0.08	(0.11)	0.09	(0.12)	0.09	(0.19)
SECTOR1	0.01	(0.09)	0.01	(0.07)	0.02	(0.13)	0.01	(0.11)	0.01	(0.10)	0.02	(0.13)
SECTOR2	0.03	(0.18)	0.04	(0.19)	0.03	(0.17)	0.02	(0.13)	0.04	(0.20)	0.03	(0.18)
SECTOR3	0.02	(0.13)	0.01	(0.09)	0.02	(0.14)	0.01	(0.08)	0.01	(0.10)	0.01	(0.07)
SECTOR4	0.03	(0.18)	0.02	(0.14)	0.03	(0.17)	0.02	(0.13)	0.02	(0.15)	0.01	(0.10)
SECTOR5	0.04	(0.19)	0.02	(0.13)	0.03	(0.18)	0.02	(0.12)	0.04	(0.20)	0.00	(0.06)
SECTOR6	0.03	(0.16)	0.01	(0.11)	0.02	(0.15)	0.06	(0.23)	0.02	(0.15)	0.02	(0.13)
SECTOR7	0.03	(0.16)	0.03	(0.18)	0.04	(0.19)	0.02	(0.15)	0.03	(0.16)	0.02	(0.13)
SECTOR8	0.03	(0.17)	0.02	(0.13)	0.04	(0.19)	0.02	(0.12)	0.03	(0.17)	0.01	(0.08)
SECTOR9	0.06	(0.23)	0.08	(0.27)	0.05	(0.21)	0.07	(0.26)	0.03	(0.17)	0.02	(0.15)
SECTOR10	0.04	(0.19)	0.08	(0.26)	0.05	(0.22)	0.14	(0.34)	0.04	(0.20)	0.02	(0.14)
SECTOR11	0.02	(0.15)	0.03	(0.16)	0.03	(0.16)	0.04	(0.19)	0.03	(0.16)	0.02	(0.13)
SECTOR12	0.02	(0.13)	0.01	(0.12)	0.03	(0.17)	0.01	(0.11)	0.01	(0.10)	0.01	(0.08)
SECTOR13	0.02	(0.14)	0.02	(0.14)	0.02	(0.15)	0.02	(0.14)	0.01	(0.12)	0.01	(0.08)
SECTOR14	0.04	(0.20)	0.04	(0.19)	0.03	(0.16)	0.12	(0.33)	0.05	(0.12)	0.31	(0.46)
SECTOR15	0.02	(0.15)	0.02	(0.13)	0.03	(0.17)	0.01	(0.11)	0.02	(0.13)	0.01	(0.08)
SECTOR16	0.03	(0.16)	0.00	(0.07)	0.02	(0.14)	0.03	(0.17)	0.01	(0.11)	0.07	(0.25)
SECTOR17	0.09	(0.28)	0.07	(0.26)	0.08	(0.27)	0.07	(0.26)	0.10	(0.29)	0.01	(0.07)
SECTOR18	0.03	(0.17)	0.04	(0.19)	0.03	(0.16)	0.03	(0.17)	0.02	(0.19)	0.00	(0.05)
SECTOR19	0.06	(0.24)	0.12	(0.32)	0.06	(0.23)	0.05	(0.20)	0.02	(0.15)	0.03	(0.16)
SECTOR20	0.05	(0.21)	0.05	(0.21)	0.05	(0.22)	0.02	(0.15)	0.07	(0.26)	0.03	(0.17)
SECTOR21	0.03	(0.16)	0.01	(0.11)	0.03	(0.17)	0.01	(0.10)	0.09	(0.29)	0.01	(0.09)
SECTOR22	0.03	(0.18)	0.04	(0.19)	0.03	(0.16)	0.02	(0.13)	0.04	(0.19)	0.09	(0.28)
SECTOR23	0.01	(0.07)			0.01	(0.10)	0.02		0.01	(0.08)		
SECTOR24	0.05	(0.21)	0.05	(0.22)	0.05	(0.21)	0.02	(0.14)	0.04	(0.19)	0.03	(0.17)
SECTOR25	0.03	(0.16)	0.01	(0.10)	0.02	(0.15)	0.01	(0.07)	0.02	(0.15)	0.13	(0.33)
SECTOR26	0.02	(0.15)	0.01	(0.12)	0.02	(0.13)	0.06	(0.23)	0.04	(0.18)	0.01	(0.09)
SECTOR27	0.02	(0.13)	0.01	(0.09)	0.02	(0.13)	0.02	(0.13)	0.02	(0.14)	0.00	(0.05)
SECTOR28	0.01	(0.10)	0.04	(0.20)	0.01	(0.08)	0.01	(0.08)	0.01	(0.07)	0.04	(0.19)
SECTOR29	0.02	(0.12)	0.01	(0.07)	0.01	(0.09)	0.00	(0.06)	0.02	(0.13)	0.00	(0.06)
SECTOR30	0.01	(0.10)	0.01	(0.08)	0.01	(0.08)	0.01	(0.08)	0.01	(0.07)	0.01	(0.07)
SECTOR31	0.00	(0.09)	0.00	(0.07)	0.01	(0.07)	0.00	(0.02)	0.02	(0.12)	0.00	(0.03)
SECTOR33	0.01	(0.09)	0.00	(0.06)	0.01	(0.09)	0.01	(0.09)	0.01	(0.08)	0.00	(0.05)
SECTOR34	0.09	(0.28)	0.11	(0.31)	0.09	(0.29)	0.07	(0.26)	0.06	(0.24)	0.07	(0.25)

Table 9: Descriptive statistics: females

Label	No collective agreement				Sectoral Bargaining				Firm Bargaining			
	2001		2006		2001		2006		2001		2006	
	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.	Mean	Stdd.
Individual level												
Age	38.40	(8.40)	39.29	(8.64)	39.32	(8.57)	40.59	(8.27)	38.62	(8.42)	39.98	(8.74)
Age squared	1545	(663.2)	1619	(684.4)	1619	(683.4)	1716	(665.6)	1562	(666.9)	1674	(697.1)
Tenure	5.89	(6.76)	7.33	(7.10)	10.02	(8.82)	10.85	(9.10)	9.38	(8.30)	12.23	(8.53)
Tenure squared	80.46	(171.8)	104.2	(195.1)	178.1	(266.1)	222.3	(272.5)	200.4	(290.8)	222.3	(272.5)
Low education	0.15	(0.36)	0.13	(0.34)	0.20	(0.40)	0.15	(0.35)	0.18	(0.39)	0.17	(0.38)
Medium education	0.64	(0.48)	0.61	(0.49)	0.68	(0.47)	0.63	(0.48)	0.69	(0.46)	0.68	(0.47)
High education	0.07	(0.25)	0.08	(0.27)	0.06	(0.25)	0.12	(0.33)	0.06	(0.24)	0.09	(0.28)
Education n/a	0.14	(0.35)	0.18	(0.38)	0.05	(0.23)	0.09	(0.29)	0.06	(0.24)	0.06	(0.24)
Extra shifts	0.09	(0.29)	0.12	(0.32)	0.14	(0.35)	0.16	(0.37)	0.34	(0.47)	0.30	(0.46)
Firm level												
REGION1	0.09	(0.29)	0.08	(0.27)	0.06	(0.24)	0.07	(0.25)	0.04	(0.20)	0.08	(0.26)
REGION2	0.08	(0.28)	0.10	(0.29)	0.10	(0.31)	0.10	(0.30)	0.17	(0.37)	0.19	(0.39)
REGION3	0.23	(0.42)	0.27	(0.44)	0.28	(0.45)	0.27	(0.44)	0.21	(0.41)	0.19	(0.39)
REGION4	0.13	(0.33)	0.12	(0.33)	0.10	(0.30)	0.11	(0.31)	0.12	(0.32)	0.15	(0.36)
REGION5	0.05	(0.22)	0.05	(0.21)	0.07	(0.25)	0.07	(0.25)	0.07	(0.25)	0.06	(0.24)
REGION6	0.23	(0.42)	0.18	(0.39)	0.19	(0.39)	0.20	(0.40)	0.20	(0.40)	0.12	(0.33)
REGION7	0.18	(0.39)	0.21	(0.40)	0.19	(0.39)	0.19	(0.40)	0.21	(0.41)	0.21	(0.41)
FIRMSIZE1	0.53	(0.50)	0.47	(0.50)	0.55	(0.50)	0.20	(0.40)	0.54	(0.50)	0.14	(0.34)
FIRMSIZE2	0.13	(0.34)	0.15	(0.36)	0.12	(0.33)	0.14	(0.35)	0.12	(0.33)	0.08	(0.27)
FIRMSIZE3	0.22	(0.41)	0.25	(0.43)	0.21	(0.41)	0.37	(0.48)	0.21	(0.40)	0.33	(0.47)
FIRMSIZE4	0.04	(0.20)	0.04	(0.20)	0.04	(0.21)	0.12	(0.33)	0.04	(0.18)	0.17	(0.37)
FIRMSIZE5	0.08	(0.28)	0.08	(0.28)	0.08	(0.27)	0.17	(0.38)	0.10	(0.30)	0.30	(0.46)
PUBLIC	0.04	(0.21)	0.01	(0.11)	0.05	(0.22)	0.07	(0.25)	0.06	(0.24)	0.26	(0.44)
S_MALE	0.67	(0.25)	0.48	(0.24)	0.65	(0.26)	0.56	(0.22)	0.66	(0.25)	0.58	(0.21)
S_NOT_FT	0.16	(0.18)	0.20	(0.20)	0.15	(0.18)	0.16	(0.17)	0.16	(0.15)	0.14	(0.13)
SECTOR1	0.01	(0.10)	0.00	(0.03)	0.01	(0.10)	0.00	(0.04)	0.02	(0.13)	0.00	(0.06)
SECTOR2	0.03	(0.18)	0.07	(0.25)	0.03	(0.18)	0.03	(0.18)	0.04	(0.20)	0.06	(0.24)
SECTOR3	0.02	(0.14)	0.02	(0.15)	0.02	(0.15)	0.02	(0.12)	0.02	(0.15)	0.01	(0.10)
SECTOR4	0.04	(0.19)	0.01	(0.10)	0.03	(0.16)	0.01	(0.10)	0.07	(0.26)	0.01	(0.11)
SECTOR5	0.03	(0.18)	0.02	(0.15)	0.03	(0.18)	0.03	(0.16)	0.04	(0.20)	0.01	(0.08)
SECTOR6	0.04	(0.19)	0.02	(0.13)	0.02	(0.14)	0.06	(0.23)	0.03	(0.18)	0.02	(0.14)
SECTOR7	0.03	(0.17)	0.03	(0.16)	0.04	(0.19)	0.02	(0.14)	0.03	(0.16)	0.02	(0.13)
SECTOR8	0.03	(0.18)	0.01	(0.10)	0.03	(0.17)	0.01	(0.10)	0.02	(0.15)	0.01	(0.08)
SECTOR9	0.06	(0.23)	0.03	(0.17)	0.05	(0.22)	0.04	(0.20)	0.03	(0.18)	0.01	(0.09)
SECTOR10	0.04	(0.20)	0.04	(0.19)	0.05	(0.21)	0.07	(0.25)	0.05	(0.21)	0.01	(0.11)
SECTOR11	0.03	(0.16)	0.02	(0.15)	0.03	(0.16)	0.04	(0.19)	0.02	(0.14)	0.01	(0.09)
SECTOR12	0.02	(0.13)	0.02	(0.12)	0.02	(0.15)	0.01	(0.11)	0.01	(0.12)	0.01	(0.08)
SECTOR13	0.02	(0.14)	0.02	(0.15)	0.02	(0.13)	0.02	(0.15)	0.02	(0.12)	0.01	(0.07)
SECTOR14	0.05	(0.21)	0.02	(0.12)	0.02	(0.15)	0.04	(0.20)	0.01	(0.12)	0.11	(0.31)
SECTOR15	0.02	(0.15)	0.02	(0.12)	0.02	(0.15)	0.01	(0.10)	0.01	(0.11)	0.01	(0.07)
SECTOR16	0.03	(0.16)	0.00	(0.04)	0.03	(0.16)	0.02	(0.14)	0.01	(0.09)	0.03	(0.18)
SECTOR17	0.08	(0.27)	0.01	(0.11)	0.08	(0.27)	0.02	(0.12)	0.06	(0.24)	0.00	(0.05)
SECTOR18	0.04	(0.19)	0.02	(0.13)	0.03	(0.17)	0.02	(0.13)	0.04	(0.19)	0.00	(0.04)
SECTOR19	0.05	(0.23)	0.13	(0.33)	0.06	(0.23)	0.05	(0.22)	0.02	(0.15)	0.03	(0.18)
SECTOR20	0.04	(0.21)	0.14	(0.35)	0.06	(0.24)	0.10	(0.30)	0.06	(0.24)	0.05	(0.22)
SECTOR21	0.02	(0.15)	0.03	(0.18)	0.03	(0.16)	0.03	(0.18)	0.05	(0.22)	0.03	(0.18)
SECTOR22	0.02	(0.15)	0.01	(0.12)	0.03	(0.16)	0.01	(0.08)	0.03	(0.17)	0.07	(0.25)
SECTOR23	0.01	(0.08)			0.01	(0.08)			0.01	(0.09)		
SECTOR24	0.04	(0.19)	0.04	(0.19)	0.05	(0.22)	0.02	(0.14)	0.04	(0.19)	0.08	(0.27)
SECTOR25	0.02	(0.15)	0.01	(0.09)	0.02	(0.15)	0.01	(0.08)	0.03	(0.17)	0.24	(0.43)
SECTOR26	0.02	(0.14)	0.03	(0.16)	0.02	(0.15)	0.15	(0.36)	0.03	(0.18)	0.02	(0.14)
SECTOR27	0.02	(0.13)	0.02	(0.12)	0.02	(0.13)	0.05	(0.21)	0.01	(0.11)	0.01	(0.08)
SECTOR28	0.02	(0.12)	0.03	(0.17)	0.02	(0.13)	0.01	(0.08)	0.03	(0.18)	0.03	(0.18)
SECTOR29	0.02	(0.12)	0.01	(0.09)	0.01	(0.10)	0.00	(0.06)	0.01	(0.10)	0.01	(0.08)
SECTOR30	0.01	(0.10)	0.01	(0.11)	0.01	(0.10)	0.01	(0.11)	0.01	(0.07)	0.01	(0.09)
SECTOR31	0.00	(0.06)	0.01	(0.07)	0.00	(0.06)	0.00	(0.04)	0.05	(0.22)	0.00	(0.06)
SECTOR33	0.01	(0.10)	0.01	(0.08)	0.01	(0.09)	0.01	(0.10)	0.00	(0.06)	0.00	(0.05)
SECTOR34	0.09	(0.28)	0.18	(0.38)	0.10	(0.30)	0.10	(0.30)	0.08	(0.27)	0.10	(0.30)

Table 10: Coefficients: No collective bargaining, 2001

	10th percentile		50th percentile		90th percentile	
	Men	Women	Men	Women	Men	Women
Individual level						
Intercept	1.869	2.134	1.844	2.065	1.656	1.701
Age	0.025	0.006	0.043	0.026	0.075	0.069
Age squared	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
Tenure	0.025	0.019	0.017	0.016	0.015	0.015
Tenure squared	-0.001	-0.000	-0.000	-0.000	-0.000	-0.000
Low education	-0.223	-0.306	-0.114	-0.194	0.105	0.025
High education	0.390	0.314	0.123	0.257	0.115	0.071
Education n/a	-0.023	-0.038	0.118	0.303	0.213	0.477
Extra shifts	-0.018	-0.001	-0.035	-0.042	-0.123	-0.112
AGE_LOW	0.001	0.004	-0.003	-0.002	-0.011	-0.008
AGE_HIGH	0.001	0.001	0.009	0.005	0.009	0.011
AGE_NA	-0.002	-0.002	-0.005	-0.010	-0.005	-0.012
Firm level						
SECTOR1	-0.094	-0.060	-0.110	-0.018	-0.213	-0.092
SECTOR2	-0.071	-0.062	-0.060	-0.007	-0.071	-0.062
SECTOR3	0.043	-0.017	0.029	-0.011	-0.020	-0.029
SECTOR4	0.006	-0.016	0.019	0.019	-0.038	-0.053
SECTOR5	0.003	0.024	-0.020	-0.013	-0.075	-0.127
SECTOR6	-0.003	-0.088	-0.043	-0.050	-0.148	-0.171
SECTOR7	0.018	0.004	0.031	0.024	-0.004	-0.016
SECTOR8	0.029	0.043	-0.022	0.066	-0.128	0.005
SECTOR9	-0.035	-0.035	-0.056	-0.023	-0.137	-0.051
SECTOR10	-0.003	-0.032	-0.023	-0.020	-0.122	-0.117
SECTOR11	-0.035	0.003	-0.087	-0.045	-0.189	-0.072
SECTOR12	-0.015	-0.050	-0.067	-0.044	-0.238	-0.150
SECTOR13	-0.001	0.032	-0.025	0.033	-0.087	-0.037
SECTOR14	-0.078	0.017	-0.132	-0.032	-0.259	-0.123
SECTOR15	-0.004	0.081	-0.059	0.003	-0.175	-0.106
SECTOR16	-0.005	0.032	-0.086	-0.060	-0.243	-0.096
SECTOR17	-0.015	-0.046	-0.064	-0.033	-0.174	-0.103
SECTOR18	-0.081	-0.080	-0.047	-0.002	-0.082	-0.043
SECTOR19	-0.019	-0.010	-0.047	0.018	-0.092	-0.052
SECTOR20	-0.055	-0.038	-0.076	-0.040	-0.204	-0.166
SECTOR21	0.011	0.037	-0.024	0.076	-0.121	-0.063
SECTOR22	-0.016	0.030	-0.067	-0.008	-0.199	-0.099
SECTOR23	-0.036	-0.116	-0.062	-0.090	-0.075	-0.218
SECTOR24	-0.009	0.011	-0.028	0.043	-0.032	0.001
SECTOR25	-0.009	0.017	-0.056	-0.041	-0.210	-0.128
SECTOR26	-0.032	0.006	-0.033	0.010	-0.119	-0.073
SECTOR27	-0.029	-0.032	-0.093	-0.015	-0.145	-0.057
SECTOR28	0.038	0.050	0.026	0.012	-0.057	-0.121
SECTOR30	-0.059	-0.020	-0.104	-0.020	-0.224	-0.185
SECTOR31	-0.130	-0.042	-0.050	0.010	-0.028	-0.069
SECTOR33	0.016	-0.024	-0.045	-0.050	-0.252	-0.114
SECTOR34	-0.018	-0.001	-0.038	-0.003	-0.112	-0.060
REGION1	-0.013	0.013	0.026	0.082	0.066	0.100
REGION2	-0.073	-0.139	-0.065	-0.134	-0.114	-0.144
REGION4	0.011	0.046	0.038	0.092	0.132	0.115
REGION5	-0.041	-0.142	-0.043	-0.118	-0.093	-0.097
REGION6	0.037	0.009	0.031	-0.024	-0.000	-0.043
REGION7	-0.018	-0.022	-0.013	-0.010	-0.004	0.048
FIRMSIZE1	-0.034	-0.020	-0.050	-0.044	-0.080	-0.055
FIRMSIZE2	-0.022	-0.018	-0.029	-0.023	-0.058	-0.035
FIRMSIZE3	-0.047	-0.033	-0.054	-0.049	-0.066	-0.040
FIRMSIZE4	-0.014	-0.032	-0.035	-0.038	-0.072	-0.035
S_NOT_FT	-0.284	-0.211	-0.260	-0.337	-0.268	-0.448
PUBLIC	-0.005	-0.036	0.057	0.017	0.129	0.029
S_MALE	0.014	-0.006	0.020	0.012	0.073	-0.040
Observations	69435	26251	69435	26251	69435	26251

Table 11: Coefficients: Sectoral collective bargaining, 2001

	10th percentile		50th percentile		90th percentile	
	Men	Women	Men	Women	Men	Women
Individual level						
Intercept	2.155	2.206	2.312	2.338	2.441	2.449
Age	0.018	-0.004	0.027	0.014	0.040	0.034
Age squared	-0.000	0.000	-0.000	-0.000	-0.000	-0.000
Tenure	0.025	0.031	0.015	0.017	0.005	0.018
Tenure squared	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000
Low education	-0.025	-0.037	0.020	0.063	0.130	0.055
High education	0.391	0.298	0.061	0.259	-0.059	-0.061
Education n/a	-0.257	-0.278	-0.144	-0.039	-0.221	0.012
Extra shifts	0.030	0.003	-0.041	-0.039	-0.126	-0.096
AGE_LOW	-0.002	-0.001	-0.004	-0.004	-0.007	-0.004
AGE_HIGH	0.002	0.002	0.009	0.003	0.010	0.012
AGE_NA	0.004	0.006	0.002	-0.000	0.005	-0.002
Firm level						
SECTOR1	-0.098	-0.044	-0.090	-0.094	-0.152	-0.272
SECTOR2	-0.077	-0.032	-0.070	-0.024	-0.053	-0.014
SECTOR3	-0.187	-0.000	-0.287	-0.174	-0.219	-0.284
SECTOR4	-0.149	0.153	-0.174	0.028	-0.284	-0.222
SECTOR5	-0.241	0.083	-0.224	-0.091	-0.253	-0.222
SECTOR6	-0.226	0.125	-0.233	-0.024	-0.247	-0.220
SECTOR7	-0.050	0.064	-0.125	0.011	-0.253	-0.147
SECTOR8	-0.105	-0.004	-0.173	-0.047	-0.301	-0.201
SECTOR9	-0.167	0.094	-0.250	0.006	-0.258	-0.108
SECTOR10	-0.144	0.147	-0.122	0.021	-0.195	-0.084
SECTOR11	-0.111	0.179	-0.203	-0.048	-0.333	-0.234
SECTOR12	-0.170	0.155	-0.133	0.097	-0.157	0.001
SECTOR13	-0.096	0.071	-0.083	0.180	0.089	0.317
SECTOR14	-0.203	0.146	-0.238	0.019	-0.277	-0.126
SECTOR15	-0.171	0.168	-0.043	0.049	-0.073	-0.029
SECTOR16	-0.192	0.216	-0.231	0.144	-0.265	-0.064
SECTOR17	-0.090	0.152	-0.094	0.102	-0.106	0.101
SECTOR18	-0.169	0.063	-0.207	-0.045	-0.200	-0.222
SECTOR19	-0.098	0.051	-0.074	0.022	-0.109	-0.083
SECTOR20	-0.146	0.156	-0.173	-0.001	-0.232	-0.213
SECTOR21	0.050	0.249	0.050	0.226	0.016	0.174
SECTOR22	-0.139	0.073	-0.076	-0.034	-0.050	-0.067
SECTOR23	-0.059	0.054	-0.182	0.012	-0.252	-0.081
SECTOR24	-0.178	0.174	-0.223	0.063	-0.250	0.108
SECTOR25	-0.221	0.091	-0.183	-0.016	-0.053	-0.102
SECTOR26	-0.187	0.053	-0.145	-0.001	-0.130	-0.156
SECTOR27	-0.145	0.157	-0.164	-0.063	-0.146	-0.316
SECTOR28	-0.321	0.153	-0.438	-0.040	-0.244	-0.069
SECTOR30	-0.032	0.279	-0.021	0.048	0.214	0.037
SECTOR31	-0.126	0.163	-0.085	0.038	-0.130	-0.108
SECTOR33	-0.190	0.087	-0.082	-0.049	-0.177	0.038
SECTOR34	-0.207	0.034	-0.198	-0.050	-0.206	-0.144
REGION1	0.054	0.084	0.199	0.144	0.327	0.183
REGION2	0.052	-0.025	0.097	-0.012	0.050	-0.010
REGION4	0.033	0.086	0.116	0.104	0.141	0.130
REGION5	-0.066	-0.155	-0.057	-0.109	-0.123	-0.164
REGION6	-0.041	0.019	-0.059	-0.037	-0.150	-0.051
REGION7	-0.063	-0.048	-0.063	-0.084	-0.081	-0.079
FIRMSIZE1	-0.053	-0.000	-0.037	-0.020	-0.041	-0.008
FIRMSIZE2	0.008	0.090	0.006	0.064	-0.014	0.072
FIRMSIZE3	0.008	0.065	0.048	0.075	0.058	0.092
FIRMSIZE4	-0.087	0.037	-0.047	-0.034	0.113	0.135
S_NOT_FT	-0.126	-0.029	-0.288	-0.311	-0.341	-0.512
PUBLIC	0.123	0.151	0.059	0.132	0.062	0.148
S_MALE	0.016	-0.036	0.062	-0.010	0.093	-0.068
Observations	145499	43639	145499	43639	145499	43639

Table 12: Coefficients: Firm-specific collective bargaining, 2001

	10th percentile		50th percentile		90th percentile	
	Men	Women	Men	Women	Men	Women
Individual level						
Intercept	2.179	2.383	2.223	2.411	2.223	2.140
Age	0.016	0.003	0.026	0.017	0.044	0.046
Age squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001
Tenure	0.016	0.016	0.011	0.014	0.004	0.005
Tenure squared	-0.000	-0.000	-0.000	-0.000	-0.000	0.000
Low education	-0.110	-0.201	-0.033	-0.134	0.107	-0.045
High education	0.275	0.222	0.208	0.160	0.089	0.012
Education n/a	-0.222	-0.369	-0.046	-0.129	0.042	0.090
Extra shifts	0.061	0.000	0.038	-0.023	-0.057	-0.071
AGE_LOW	-0.001	0.001	-0.003	-0.002	-0.008	-0.004
AGE_HIGH	0.005	0.003	0.007	0.007	0.007	0.011
AGE_NA	0.001	0.004	-0.002	-0.001	-0.004	-0.005
Firm level						
SECTOR1	0.040	-0.013	0.060	0.005	-0.030	0.053
SECTOR2	-0.032	-0.034	-0.031	-0.073	-0.070	-0.062
SECTOR3	-0.045	0.038	-0.017	0.009	-0.050	-0.024
SECTOR4	-0.007	-0.065	0.028	-0.045	0.026	-0.003
SECTOR5	-0.015	-0.028	0.010	-0.043	-0.021	-0.013
SECTOR6	-0.005	0.028	0.021	-0.049	-0.028	-0.068
SECTOR7	-0.014	0.002	0.043	-0.027	0.032	0.025
SECTOR8	0.003	-0.019	0.028	-0.005	-0.037	0.004
SECTOR9	-0.055	-0.045	-0.011	-0.065	-0.064	-0.052
SECTOR10	-0.019	-0.054	0.027	-0.037	-0.016	-0.033
SECTOR11	-0.034	0.014	-0.024	-0.042	-0.054	-0.043
SECTOR12	-0.020	0.026	-0.022	-0.007	-0.079	-0.011
SECTOR13	-0.012	-0.070	0.013	-0.029	-0.045	-0.017
SECTOR14	-0.001	-0.016	-0.002	-0.043	-0.067	-0.048
SECTOR15	-0.070	-0.083	-0.035	-0.091	-0.055	-0.062
SECTOR16	-0.042	-0.091	0.007	-0.074	-0.061	-0.042
SECTOR17	-0.042	-0.042	-0.015	-0.055	-0.058	-0.050
SECTOR18	-0.026	0.020	-0.016	-0.009	-0.049	-0.024
SECTOR19	-0.009	0.021	-0.001	-0.042	-0.039	-0.035
SECTOR20	-0.046	-0.083	-0.006	-0.115	-0.050	-0.086
SECTOR21	-0.019	-0.028	0.003	-0.021	-0.020	0.018
SECTOR22	-0.052	-0.041	-0.005	-0.059	-0.060	-0.045
SECTOR23	-0.097	0.005	-0.038	-0.012	-0.085	0.277
SECTOR24	-0.012	-0.011	-0.016	-0.043	-0.058	-0.033
SECTOR25	-0.039	-0.051	-0.011	-0.087	-0.070	-0.059
SECTOR26	-0.051	-0.014	-0.014	-0.067	-0.053	-0.028
SECTOR27	-0.025	0.035	-0.004	-0.029	-0.054	0.024
SECTOR28	-0.004	-0.002	0.000	-0.040	0.031	-0.044
SECTOR30	0.001	0.044	0.022	0.014	-0.062	0.004
SECTOR31	0.012	-0.140	0.029	-0.149	-0.026	-0.003
SECTOR33	-0.015	0.009	-0.013	0.007	-0.019	-0.047
SECTOR34	-0.030	-0.020	-0.000	-0.045	-0.044	-0.047
REGION1	0.002	-0.008	0.024	0.019	0.101	0.083
REGION2	-0.050	-0.083	-0.068	-0.052	-0.099	-0.044
REGION4	0.010	0.035	-0.001	0.042	0.008	0.043
REGION5	-0.023	-0.113	-0.020	-0.042	-0.060	-0.054
REGION6	0.065	0.045	0.062	0.037	0.047	0.049
REGION7	-0.015	-0.025	-0.019	0.003	-0.027	0.027
FIRMSIZE1	-0.016	-0.028	-0.010	-0.022	-0.007	0.003
FIRMSIZE2	-0.025	-0.018	-0.013	-0.015	0.006	0.010
FIRMSIZE3	-0.012	-0.017	-0.010	-0.014	-0.018	-0.014
FIRMSIZE4	-0.027	-0.003	-0.036	-0.009	-0.037	0.019
S_NOT_FT	-0.411	-0.311	-0.331	-0.451	-0.256	-0.558
PUBLIC	0.004	-0.001	-0.033	0.005	0.004	0.043
S_MALE	-0.007	-0.037	-0.024	-0.041	-0.011	-0.023
Observations	26255	8120	26255	8120	26255	8120

Table 13: Coefficients: No collective bargaining, 2006

	10th percentile		50th percentile		90th percentile	
	Men	Women	Men	Women	Men	Women
Individual level						
Intercept	1.571	1.937	1.827	1.776	1.968	1.565
Age	0.036	0.015	0.051	0.044	0.077	0.075
Age squared	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001
Tenure	0.022	0.022	0.015	0.014	0.011	0.009
Tenure squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Low education	-0.130	-0.303	-0.006	-0.114	0.188	0.089
High education	0.109	0.138	0.019	0.070	-0.059	0.106
Education n/a	-0.026	0.035	0.065	0.176	-0.039	0.138
Extra shifts	0.021	-0.004	-0.014	-0.037	-0.086	-0.067
AGE_LOW	-0.001	0.003	-0.004	-0.002	-0.009	-0.008
AGE_HIGH	0.007	0.005	0.009	0.008	0.010	0.007
AGE_NA	-0.002	-0.003	-0.003	-0.006	0.001	-0.004
Firm level						
SECTOR1	0.081	0.056	-0.044	-0.023	-0.207	-0.021
SECTOR2	0.062	-0.100	-0.119	-0.254	-0.242	-0.329
SECTOR3	0.058	-0.090	-0.112	-0.197	-0.213	-0.166
SECTOR4	0.119	-0.014	-0.059	-0.142	-0.188	-0.205
SECTOR5	0.294	0.115	0.155	0.073	0.037	0.051
SECTOR6	0.196	0.056	0.041	0.017	-0.100	-0.020
SECTOR7	0.130	-0.122	-0.049	-0.183	-0.174	-0.231
SECTOR8	0.153	-0.080	-0.036	-0.166	-0.201	-0.285
SECTOR9	0.208	0.041	0.020	-0.078	-0.134	-0.196
SECTOR10	0.229	0.097	0.043	-0.051	-0.091	-0.160
SECTOR11	0.213	-0.009	0.036	-0.097	-0.104	-0.127
SECTOR12	0.248	0.068	0.117	-0.038	-0.015	-0.082
SECTOR13	0.191	0.007	0.045	-0.081	-0.077	-0.139
SECTOR14	0.251	0.070	0.099	0.042	-0.029	-0.061
SECTOR15	0.102	-0.074	-0.094	-0.197	-0.252	-0.243
SECTOR16	0.374	0.268	0.204	0.107	-0.049	-0.036
SECTOR17	0.191	-0.050	-0.031	-0.115	-0.219	-0.211
SECTOR18	0.142	-0.004	-0.030	-0.112	-0.145	-0.113
SECTOR19	0.147	0.077	0.032	0.027	-0.008	0.068
SECTOR20	0.090	0.023	-0.101	-0.095	-0.125	-0.127
SECTOR21	-0.094	-0.130	-0.194	-0.238	-0.285	-0.229
SECTOR22	-0.040	-0.132	-0.208	-0.130	-0.317	-0.124
SECTOR24	0.017	0.001	-0.145	-0.073	-0.242	-0.120
SECTOR25	0.110	0.027	0.105	0.047	0.039	0.019
SECTOR26	0.391	0.320	0.332	0.244	0.186	0.152
SECTOR27	0.226	0.258	0.149	0.098	0.039	0.003
SECTOR28	0.321	0.155	0.240	0.112	0.155	0.106
SECTOR29	-0.060	-0.053	-0.095	-0.068	-0.113	-0.077
SECTOR30	0.232	0.126	0.100	0.113	0.042	0.062
SECTOR31	0.149	0.133	0.038	0.039	-0.004	0.012
SECTOR33	0.334	0.201	0.165	0.145	0.045	0.072
REGION1	-0.017	0.025	0.002	0.038	0.037	0.035
REGION2	-0.079	-0.069	-0.089	-0.085	-0.108	-0.112
REGION4	0.003	0.050	0.012	0.045	0.062	0.074
REGION5	-0.040	-0.058	-0.038	-0.056	-0.041	-0.048
REGION6	0.055	0.025	0.039	0.003	0.009	-0.016
REGION7	-0.017	0.032	-0.017	0.019	-0.021	0.033
FIRMSIZE1	-0.193	-0.179	-0.175	-0.155	-0.143	-0.188
FIRMSIZE2	-0.182	-0.160	-0.140	-0.146	-0.088	-0.158
FIRMSIZE3	-0.147	-0.138	-0.110	-0.114	-0.087	-0.138
FIRMSIZE4	-0.060	-0.048	-0.023	-0.020	-0.007	-0.046
S_NOT_FT	-0.247	-0.180	-0.370	-0.275	-0.606	-0.372
PUBLIC	-0.022	0.006	-0.026	-0.045	-0.049	-0.080
S_MALE	-0.012	0.096	-0.154	0.097	-0.408	0.127
Observations	253507	99461	253507	99462	253507	99462

Table 14: Coefficients: Sectoral collective bargaining, 2006

	10th percentile		50th percentile		90th percentile	
	Men	Women	Men	Women	Men	Women
Individual level						
Intercept	1.890	1.903	2.146	2.012	2.560	2.071
Age	0.020	0.016	0.031	0.034	0.042	0.048
Age squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001
Tenure	0.025	0.017	0.014	0.011	0.004	0.009
Tenure squared	-0.001	-0.000	-0.000	-0.000	-0.000	-0.000
Low education	-0.149	-0.017	-0.066	-0.002	0.144	-0.029
High education	0.315	0.132	0.173	-0.021	-0.015	-0.145
Education n/a	-0.202	-0.052	-0.342	-0.242	-0.333	-0.178
Extra shifts	-0.021	-0.087	-0.044	-0.178	-0.078	-0.104
AGE_LOW	0.001	-0.001	-0.002	-0.001	-0.007	-0.003
AGE_HIGH	0.002	0.004	0.004	0.008	0.006	0.011
AGE_NA	0.003	-0.001	0.007	0.005	0.009	0.002
Firm level						
SECTOR1	0.297	0.247	0.127	0.116	0.012	0.003
SECTOR2	0.039	-0.057	-0.095	-0.202	-0.117	-0.229
SECTOR3	-0.045	-0.115	-0.243	-0.217	-0.314	-0.225
SECTOR4	0.064	-0.038	-0.091	-0.306	-0.075	-0.429
SECTOR5	0.237	0.203	0.053	-0.016	0.013	-0.134
SECTOR6	0.180	0.065	0.150	-0.035	0.122	-0.061
SECTOR7	0.113	0.030	-0.091	-0.176	-0.206	-0.393
SECTOR8	0.016	-0.161	-0.205	-0.365	-0.274	-0.473
SECTOR9	0.375	0.184	0.097	-0.015	-0.058	0.095
SECTOR10	0.031	-0.003	-0.214	-0.322	-0.204	-0.289
SECTOR11	0.147	0.042	-0.022	-0.095	-0.067	0.013
SECTOR12	0.085	-0.034	-0.022	-0.325	-0.048	-0.218
SECTOR13	0.222	0.200	0.027	-0.016	-0.102	-0.266
SECTOR14	0.324	0.243	0.165	0.100	0.091	0.050
SECTOR15	0.046	-0.010	-0.208	-0.282	-0.361	-0.319
SECTOR16	0.394	0.335	0.241	0.101	0.141	-0.001
SECTOR17	0.133	0.105	-0.103	-0.193	-0.206	-0.392
SECTOR18	-0.102	-0.279	-0.246	-0.303	-0.165	-0.506
SECTOR19	0.013	-0.083	-0.065	-0.164	0.044	-0.029
SECTOR20	0.074	0.024	0.413	0.096	0.281	0.109
SECTOR21	-0.062	-0.116	-0.113	-0.217	-0.074	-0.189
SECTOR22	-0.015	0.011	-0.257	-0.170	-0.308	-0.188
SECTOR24	0.121	0.136	0.069	0.033	0.553	0.012
SECTOR25	-0.042	-0.307	-0.146	-0.326	-0.251	-0.288
SECTOR26	0.438	0.408	0.253	0.210	0.110	0.186
SECTOR27	0.321	0.433	0.146	0.150	0.038	-0.094
SECTOR28	0.267	0.215	0.144	0.063	0.077	-0.013
SECTOR29	-0.051	-0.087	-0.037	-0.024	-0.036	-0.198
SECTOR30	0.286	0.326	0.081	0.102	0.045	0.057
SECTOR31	0.093	-0.095	-0.090	-0.249	-0.011	0.024
SECTOR33	0.205	0.269	0.069	0.053	0.028	-0.037
REGION1	-0.060	-0.018	-0.019	0.047	-0.001	0.098
REGION2	-0.003	-0.020	-0.012	-0.031	-0.016	-0.046
REGION4	-0.042	0.021	-0.032	0.057	-0.053	0.021
REGION5	-0.056	-0.007	-0.040	-0.038	-0.053	0.002
REGION6	0.035	0.052	-0.006	0.022	-0.029	-0.001
REGION7	0.034	0.057	0.001	0.078	0.006	0.084
FIRMSIZE1	-0.093	-0.150	-0.109	0.070	-0.136	-0.009
FIRMSIZE2	-0.122	-0.125	-0.089	-0.054	-0.065	-0.023
FIRMSIZE3	-0.085	-0.091	-0.059	-0.067	-0.062	-0.001
FIRMSIZE4	-0.010	-0.045	0.011	-0.036	0.041	0.033
S_NOT_FT	0.005	-0.033	0.038	-0.039	-0.072	0.008
PUBLIC	0.042	-0.048	-0.062	-0.062	-0.173	-0.178
S_MALE	0.030	0.211	0.022	0.274	-0.201	0.191
Observations	242759	80824	242759	80824	242759	80824

Table 15: Coefficients: Firm-specific collective bargaining, 2006

	10th percentile		50th percentile		90th percentile	
	Men	Women	Men	Women	Men	Women
Individual level						
Intercept	1.484	1.694	1.645	1.650	2.068	1.701
Age	0.024	0.015	0.036	0.037	0.052	0.063
Age squared	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001
Tenure	0.014	0.015	0.010	0.010	0.004	0.003
Tenure squared	-0.000	-0.000	-0.000	-0.000	-0.000	0.000
Low education	-0.085	-0.105	-0.066	-0.105	0.063	0.016
High education	0.052	-0.030	0.049	0.051	-0.057	-0.074
Education n/a	-0.034	-0.091	-0.007	0.041	-0.018	0.167
Extra shifts	0.037	0.018	-0.002	-0.039	-0.076	-0.068
AGE_LOW	-0.001	-0.000	-0.002	-0.002	-0.006	-0.005
AGE_HIGH	0.009	0.008	0.009	0.008	0.009	0.011
AGE_NA	-0.001	-0.000	-0.002	-0.004	-0.001	-0.006
Firm level						
SECTOR1	0.215	0.357	0.198	0.197	0.034	0.008
SECTOR2	0.381	0.139	0.314	0.065	0.088	-0.100
SECTOR3	0.301	0.173	0.253	0.120	0.062	-0.044
SECTOR4	0.407	0.259	0.317	0.205	0.088	-0.042
SECTOR5	0.568	0.431	0.551	0.409	0.382	0.279
SECTOR6	0.529	0.433	0.444	0.367	0.178	0.108
SECTOR7	0.364	0.277	0.303	0.245	0.065	0.023
SECTOR8	0.360	0.208	0.275	0.158	0.070	-0.104
SECTOR9	0.461	0.367	0.393	0.291	0.152	0.071
SECTOR10	0.503	0.426	0.418	0.354	0.198	0.084
SECTOR11	0.515	0.394	0.419	0.318	0.180	0.085
SECTOR12	0.569	0.424	0.485	0.407	0.247	0.165
SECTOR13	0.544	0.403	0.440	0.334	0.164	0.087
SECTOR14	0.545	0.458	0.429	0.409	0.175	0.147
SECTOR15	0.417	0.303	0.262	0.198	-0.001	-0.070
SECTOR16	0.497	0.429	0.392	0.297	0.128	0.032
SECTOR17	0.404	0.176	0.258	0.139	-0.021	-0.037
SECTOR18	0.380	0.263	0.275	0.153	0.091	-0.064
SECTOR19	0.365	0.264	0.352	0.234	0.196	0.150
SECTOR20	0.332	0.295	0.235	0.164	0.094	0.019
SECTOR21	0.068	0.003	0.037	-0.040	-0.134	-0.222
SECTOR22	0.322	0.271	0.194	0.183	-0.033	-0.057
SECTOR24	0.300	0.274	0.234	0.182	0.074	0.021
SECTOR25	0.425	-0.018	0.291	0.213	0.117	-0.057
SECTOR26	0.564	0.468	0.529	0.356	0.264	0.134
SECTOR27	0.539	0.545	0.474	0.379	0.196	0.059
SECTOR28	0.521	0.516	0.543	0.451	0.363	0.277
SECTOR29	-0.014	-0.025	-0.003	0.025	0.063	-0.067
SECTOR30	0.475	0.409	0.373	0.356	0.189	0.117
SECTOR31	0.222	0.147	0.289	0.172	0.622	0.211
SECTOR33	0.393	0.311	0.290	0.248	0.077	0.027
REGION1	0.001	0.002	0.008	0.018	0.012	0.027
REGION2	-0.029	-0.035	-0.054	-0.040	-0.080	-0.049
REGION4	0.023	0.051	0.017	0.058	0.004	0.057
REGION5	-0.010	-0.016	-0.024	-0.026	-0.034	-0.031
REGION6	0.075	0.036	0.068	0.038	0.042	0.038
REGION7	0.012	-0.006	-0.008	0.003	-0.022	0.013
FIRMSIZE1	-0.139	-0.107	-0.136	-0.085	-0.119	-0.086
FIRMSIZE2	-0.128	-0.101	-0.111	-0.106	-0.094	-0.120
FIRMSIZE3	-0.093	-0.066	-0.070	-0.058	-0.047	-0.058
FIRMSIZE4	-0.056	-0.057	-0.034	-0.049	-0.032	-0.043
S_NOT_FT	-0.085	-0.057	-0.159	-0.195	-0.441	-0.034
PUBLIC	-0.006	-0.034	-0.017	-0.034	-0.110	-0.007
S_MALE	0.130	0.116	0.066	0.083	-0.156	0.009
Observations	59733	21867	59733	21867	59733	21867