HOHENHEIMER
DISKUSSIONSBEITRÄGE

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by

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Nr. 294/2007

Institut für Volkswirtschaftslehre (520)
Universität Hohenheim, 70593 Stuttgart

ISSN 0930-8334

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Decomposition of Bargained Wage Differences Using Counterfactual Distributions[†]

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December 2007

Abstract

Collective bargaining agreements still play an important role in the German wage setting system. Both existing theoretical and empirical studies find that collective bargaining leads to higher wages compared to individually agreed ones. However, the impact of collective bargaining on the wage level may be very different along the wage distribution. As unions aim at compressing the wage distribution, one might expect that for covered workers' wages in the lower part of the distribution workers' individual characteristics may be less important than the coverage by a collective contract. In contrast, the relative importance of workers' individual characteristics may rise in the upper part of the wage distribution, whereas the overall wage difference might decline. Using the newly available German Structure of Earnings Survey (GSES) 1995 and 2001, a cross-sectional linked employer-employee-dataset from German official statistics, this study analyses the difference between collectively and individually agreed wages using a Machado/Mata (2005) decomposition type technique.

Keywords: collective bargaining, wage structure, wage decomposition, quantile regression

JEL Code: J31, J51, C13

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Zusammenfassung

Kollektive Tarifverträge spielen immer noch eine wichtige Rolle im deutschen Lohnfindungssystem. Sowohl theoretische als auch empirische Studien kommen zu dem Ergebnis, dass kollektive Tarifverhandlungen zu vergleichsweise höheren Löhnen führen als individuelle Lohnverhandlungen. Jedoch kann der Einfluss von kollektiven Tarifverhandlungen auf das Lohnniveau innerhalb von Lohnverteilungen stark variieren. Da Gewerkschaften das Ziel verfolgen, die Streuung innerhalb der Lohnverteilung möglichst gering zu halten, ist anzunehmen, dass die Löhne von tarifvertraglich gebundenen Arbeitnehmern im unteren Teil der Verteilung weniger stark von deren Leistungsmerkmalen abhängig sind. Vielmehr macht sich hier der kollektivvertragliche Einfluss auf die Löhne bemerkbar. Dagegen sollte die relative Bedeutung der individuellen Leistungsmerkmale der Arbeitnehmer im oberen Teil der Lohnverteilung zunehmen, wohingegen die absolute Lohndifferenz in diesem Bereich fällt. Mit Hilfe der erst seit kurzem verfügbaren Gehalts- und Lohnstrukturerhebung (GLS, Wellen 1995 und 2001) wird in der vorliegenden Analyse der Unterschied zwischen kollektiv verhandelten und indivduell vereinbarten Löhnen unter Verwendung einer Machado/Mata (2005)-Zerlegungstechnik beleuchtet.

1 Introduction

This paper deals with the question why wages in firms covered by a collective bargaining agreement are higher than those in non-covered firms. In the Anglo-Saxon literature this phenomenon is called union wage gap describing the empirical fact that unions increase workers' wages (cf. e.g. Blanchflower/Bryson 2004, Card et al. 2004, Freeman 1982, Freeman/Medoff 1984, Lewis 1986). But the institutional background in Germany differs from that in the United States and Britain. Differences in wages can be observed between firms covered and not covered by a collective bargaining agreement (cf. e.g. Fitzenberger et al. 2007, Gürtzgen 2006, Heinbach 2007, Stephan/Gerlach 2005). Individual firms' bargaining coverage is more a decision of the employer to join an employers association than that of workers to join a union. Thus, the explanation of the wage gap has to take the different institutional settings into account.

Until today there is lack of theoretical models of Germany's wage-setting system to explain these wage premia. Motivated by Anglo-Saxon literature, some authors suggest that workers are split up into covered and non-covered firms (cf. Fitzenberger et al. 2007, Gürtzgen 2006). The present study adds empirical evidence to these findings. For the first time newly emerged decomposition techniques for quantile regression and newly available linked-employer-employee data from German official statistics are used to explain the covered- non-covered wage gap. We observe the wage premium to be primarily a result of workers' characteristics. The additional collective bargaining premium is higher in the lower quantiles and diminishes in the higher quantiles.

Our paper is organised as follows. Section 2 first gives a short review of the German bargaining system and second presents the theoretical background containing considerations about the link between firms' coverage decision and workers' wages as well as firms' coverage and workers' skills. We outline the econometric strategy as well as the basis of our empirical investigation - data, variables and model specifications - in section 3. Section 4 presents the empirical results and finally section 5 concludes.

2 Theoretical Considerations

> *There is still disagreement over the extent to which differences in the structure of wages between union and nonunion workers represent an effect of trade unions, rather than a consequence of the non-random selection of unionised workers (Card 1996, p. 957)*

There exist a vast number of studies reporting especially for Britain and the U.S. unionised wages being higher than those of non-unionised workers. By contrast, in Germany wages are generally not paid according to the union status of the workforce but the collective contract status of the employer.[1] However, empirical studies concerning collective bargaining report a wage premium for workers covered by a collective contract compared to those with individually agreed wages (cf. e.g. Stephan/Gerlach 2005, Fitzenberger et al. 2007, Gürtzgen 2006, Heinbach 2007). A positive wage effect of about 9% in 1995 and even 12% in 2001 is reported by Stephan/Gerlach (2005) applying a multi-level analysis to German Structure of Earning Survey Data (GSES) from the German federal state of Lower Saxony. In the quantile regression approach by Fitzenberger et al. (2007) individual coverage and the share of covered workers within each firm is accounted by using the same data for Germany. They point out that the share of workers subject to a collective contract has a positive impact on the average wage level, but decreases in higher quantiles. In the study of Gürtzgen (2006) the IAB Linked-Employer-Employee Panel (LIAB) is used to analyse the wage difference between covered and non-covered workers. Controlling for individual unobserved effects and firm-specific unobserved heterogeneity the covered- non-covered wage gap is explained by a low coverage effect and a high selection bias.

Until now, only a few authors already consider the covered wage premia in the German bargaining system from a more theoretical point of view. Büttner/Fitzenberger (1998) find collective contracts affecting especially the lower part of the wage distribution, whereas Sanner (2006) proposes the degree of centralisation as a driving force for the covered- non-covered wage gap. The theoretical explanation of empirical findings mainly focus on the Anglo-Saxon theory explaining the union- non-union wage gap (cf. e.g. Freeman/Medoff 1984). In contrast, this study centres the covered- non-covered wage gap of collective bargaining. In the following, we give a short review of the German bargaining system and present some theoretical considerations adapting the related Anglo-Saxon literature.

[1] If an employer is member of an employers association, he is obliged to apply collective bargaining agreements to at least unionised workers (cf. section 2.1).

2.1 Institutional Background: The German Bargaining System

The German bargaining system distinguishes between firms with individual agreements on wages and working conditions and those being covered by a collective contract. Covered firms either bargain at the firm level or at the industry level, whereas firm level contracts adopt mainly contents of the respective industry-level contracts.[2] Legally, the bargained wage is binding for all union members working in a firm that is covered by a bargaining agreement, i.e. the firm has agreed directly or indirectly via the respective employers association upon the collective contract. In case a firm has not, even a unionised worker is not entitled to draw the collectively bargained wage. Often, covered firms apply collectively bargained wages even to non-union members. Consequently, unions favour firms to be covered under a collective contract. But in contrast, bargaining coverage has substantially declined in recent years (cf. Fitzenberger et al. 2007) as firms turned increasingly away from employers associations in order to bargain wages individually with each of their employees.

2.2 The Link between Firms' Coverage Decision and Workers' Wages

As Card (1996, p. 957) noticed, it is not agreed upon if union wage differences result from union bargaining or from non-random selection of unionised workers. In case of Germany unions bargain higher wages but the question is if workers are non-randomly selected into covered and non-covered firms, respectively. Furthermore, the firms' decision to be covered by collective contracts matters. So the covered- non-covered wage gap may either result from union bargaining or from a non-random selection of workers into covered firms. In the following, reasons for both aspects are presented.

One important reason for firms to remunerate their employees according to a collective bargaining agreement is given by the consideration that transaction costs rise with increasing workforce if contracts have to be bargained with every single employee (cf. Freeman 1982, Freeman/Medoff 1984). So in contrast, the savings of time and negotiation costs are high if all employees are subject to the same collective contract. Another reason for applying collective contracts is due to avoiding efficiency loses that are based on social problems within a firm. This could e.g. be the case if a worker with good negotiations skills gets better paid than comparable colleagues. Altogether, the reduced bargaining costs of a firm can be distributed as wage premia to the workforce (union bargaining effect).

[2] But obviously there remains enough space for firm-specific regulations.

Assuming that employers produce at minimum costs and that wages equal somewhat workers' marginal productivity, a covered firm has to pay higher bargained wages and therefore seeks for highly productive workers. Facing a wage increase or at least a higher wage level, firms have obviously to choose between two alternatives: Either to stay under collective bargaining coverage or to leave and thus to bargain individually.

Staying under bargaining coverage implies a higher wage level. Under the assumption that wages equal workers' marginal productivity, covered firms have consequently to search for highly productive workers. If they do not, they can no longer maintain the high wage level and have as a consequence to leave collective bargaining coverage. But leaving bargaining coverage implies that the overall wage level may decrease as firms have the opportunity to bargain lower individual wages especially if workers' productivity is low. Then high-skilled workers will leave the firm and apply for a job in high-wage (covered) firms if the individual wage offer is lower than the collective bargained wage.

2.3 Workers' Skills and Firms' Coverage

This section deals with the workers point of view and their decision to apply for a job in a covered or non-covered firm, respectively. In general, workers prefer firms with high wage offers. Obviously a firm's wage offer depends on the single worker's marginal productivity which is closely related to his observable skills. Assuming workers' skills being heterogenous and some being only observable to the employer and not to the researcher, workers prefer different firms to apply for. Additionally, firms' technologies are differently sensitive towards workers' ability. Consequently, ability sensitive firms attract workers with high ability (cf. Groshen 1991). In case a firm pays wages according to the less productive workers e.g. as enforcement of firms' technology more productive workers will leave. These workers apply to firms, where the weakest productive worker equals their own productivity (cf. Groshen 1991).

Following Hirsch (2004), longitudinal evidence has shown a positive selection of low-skilled workers into unions and a negative selection among high-skilled workers. In Germany firm's coverage is more important than worker's union membership, consequently the selection of different skill levels might depend on the coverage status of the firm in an analogous way.

Another reason why workers apply for a job in a covered firm is that union bargaining guarantees at least the union wage in the future (cf. Dustmann/Schönberg 2004). Although the

influence of unions on the wages in Germany differs in some extent from that of their anglo-saxon counterparts, unions aim to compress the wage distribution. Therefore especially workers with low observable skills in the lower part of the wage distribution profit from covered status.

Summing up, workers' decisions to apply for a firm depends on two things. First, individual skills are a key variable for the wage offer. Wage offers for high-skilled workers are higher than for low-skilled. This causes an additional selection of high-skilled workers into high-wage firms. Second, wage offers for low-skilled with high ability will be higher in covered firms than in non-covered firms. Consequently low-skilled workers prefer to apply for jobs in covered firms. High-skilled workers are at least indifferent towards firms' bargaining coverage.

In the following, we investigate the relationship between workers' skills, firms' coverage and wages paid. Summing up, our theoretical considerations lead to the following hypotheses:

- Workers' wages in covered firms are higher along the whole wage distribution compared to those of workers in non-covered firms, whereas the base wage is higher and the returns of human capitals are smaller as unions reducing inequality across skill groups.

- The covered- non-covered wage gap results from two parts: one is a true bargaining effect which is highest for workers in the lowest part of the distribution. The other part results from the underlying selection of workers in covered firms. Covered firms attract high-ability workers among the low skilled.

3 Empirical Investigation

3.1 Econometric Strategy

In the following the wage difference between covered and non-covered workers wages is analysed.[3] First, we apply the decomposition technique proposed by Blinder (1973) and Oaxaca (1973) to detect and explain differences of mean wages between covered and non-covered workers. In a linear model specification with $y_t = X_t'\beta_t, (t = 0, 1)$ the counterfactuals are $X_0\hat{\beta}_1$ and

[3] Appendix A presents a detailed description of the econometric methods used in the paper.

$X_1\hat{\beta}_0$, respectively. The mean difference $\bar{Y}_1 - \bar{Y}_0$ can be then written as:

$$\bar{Y}_1 - \bar{Y}_0 = \underbrace{(\bar{X}_1\hat{\beta}_1 - \bar{X}_0\hat{\beta}_1)}_{\text{characteristics}} + \underbrace{(\bar{X}_0\hat{\beta}_1 - \bar{X}_0\hat{\beta}_0)}_{\text{coefficients (bargaining)}}. \tag{1}$$

By introducing the counterfactuals it can be shown that not only the characteristics of individuals but also the simple belonging to a group determines the magnitude of the resulting wages. The two effects are known as characteristics and coefficient effects. The characteristics effect reflects the justified wage differential between both groups due to different productivities depending on the groups' characteristics whereas the rest of the observable wage gap is contributable to the coefficients effect which honors the simple belonging to the treated group or punishes the simple belonging to the non-treated group.[4] To clarify the meaning of the term "coefficients effect" in our application which actually measures the contribution of workers' coverage by a collective bargaining agreement on wages we denote this effect in the following as "bargaining effect".

Next we follow Machado/Mata (2005) who propose an estimator of counterfactual unconditional wage distributions based on quantile regressions.[5] The difference of the θ^{th} unconditional quantile between two groups' distributions can be decomposed according to Blinder and Oaxaca (1973) as

$$\begin{aligned} \hat{F}^{-1}_{Y_1}(\theta|T=1) - \hat{F}^{-1}_{Y_0}(\theta|T=0) &= \underbrace{\hat{F}^{-1}_{Y_1}(\theta|T=1) - \hat{F}^{-1}_{Y_1}(\theta|T=0)}_{\text{characteristics}} \\ &+ \underbrace{\hat{F}^{-1}_{Y_1}(\theta|T=0) - \hat{F}^{-1}_{Y_0}(\theta|T=0)}_{\text{coefficients (bargaining)}}, \end{aligned} \tag{2}$$

where $\hat{F}^{-1}_{Y_t}(\theta|T=t)$ denotes the θ^{th} unconditional quantile of group t's wage. To estimate the unconditional quantiles and their counterfactuals, we apply the estimator proposed by Melly (2006).[6]

[4] This becomes clear if e.g. equation (1) is rewritten as $\bar{Y}_1 - \bar{Y}_0 = \underbrace{(\bar{X}_1 - \bar{X}_0)\hat{\beta}_1}_{\text{characteristics}} + \underbrace{(\hat{\beta}_1 - \hat{\beta}_0)\bar{X}_0}_{\text{coefficients}}$.

[5] A detailed description can be found in appendix A.

[6] Several authors make use of the decomposition technique proposed by Machado/Mata (2005) in their applications e.g. Albrecht et al. (2003, 2004), Kohn (2006). Unlike these studies we apply the Melly (2006) estimator of which a formal derivation and explanation can be found in appendix A.

3.2 Data

The present analysis examines the differences in log gross hourly wages between workers covered by a collective bargaining agreement and workers with individually agreed contracts using data from the German Structure and Earnings Survey (GSES). The GSES is a linked employer-employee data set including two independent cross-sectional samples of the years 1995 and 2001 with each over 850,000 observations in some 22,000 firms. By collecting data on an individual level, the GSES offers the opportunity to link individuals' personal characteristics like age, schooling or sex with individual job-related characteristics like payment rule, classification to differently skilled groups or bargaining regime.

Concerning the two-stage random sample design of the GSES, first a random sample stratified by region, industry and firm size has been drawn from all companies with more than 10 employees and belonging to the manufacturing sector as well as to parts of the services industries. Second, employees have been chosen randomly at the firm level.[7] In our paper we use a subsample of the GSES which contains exclusively firms of manufacturing industries with 100 up to 10,000 employees in West Germany.[8] As we aim to shed light on wage differences between workers of different wage-setting regimes, we restrict our sample to full-time employed blue-collar workers with at least 30 hours working time per week. After having cleared data from implausible values, our adjusted sample narrows to 282,037 observations for 1995 and to 179,711 observations for 2001[9], respectively.

3.3 Variables and Model Specifications

In this paper quantile regression technique is used in order to detect the impact of individual Mincerian (1974) characteristics, individual characteristics on firm-level and firm-specific characteristics on workers' wages. By specifying three different model types, we aim to check for robustness of our estimation results. More precisely, our first model uses the standard Mincerian wage equation including only a set of general human capital variables like age, tenure, age and tenure squared and years of schooling to explain workers' log gross hourly wages. In order to account for heteroscedasticity, we add dummy variables for structurally and geographically similar regions in West Germany and choose Baden-Württemberg as reference category due to

[7] For detailed descriptions of the GSES data set see Hafner (2006) or Frank-Bosch (2003).
[8] West Germany except West Berlin.
[9] In 2001 less observations in the manufacturing sector were drawn in favour of the service sectors.

its highest expected wages. The second model uses an extended Mincerian wage equation containing additionally information about individuals' characteristics such as sex and marital status as well as information concerning individuals' qualification levels[10] and payment rule.[11] All these variables enter the model as dummies. Finally, the third model contains further firm-level dummy variables which control for firm-specific characteristics such as different firm sizes, share of female workers, shares of differently skilled workers and shares of differently aged workers. This is necessary since one might expect that large firms, firms with a low share of female workers, firms employing particularly high-skilled workers and firms with a high share of older workers pay higher wages than their respective counterparts. Industry dummies additionally account for different wage levels over different fields of industry.[12] In the following section we present the empirical results of our study based on the methodical framework, data and model specifications.

4 Empirical Results

Before we go into the results of our decomposition analysis of the wage gap between covered and non-covered workers, we start with a descriptive comparison of wages and covariates and a subsequent presentation of estimation results for covariates' impacts on wages. Descriptive results for workers' log gross hourly wages sorted by wage-setting regimes in 1995 and 2001 are reported in table 1, where the log of gross hourly wages is given by the gross monthly compensation divided by the monthly working time.[13]

Table 1: Descriptive Statistics for workers' log gross hourly wages in West Germany, 1995 and 2001

log gross hourly wages	1995			2001			change of means in %
	mean	standard deviation	number of obs.	mean	standard deviation	number of obs.	
collective agreement (pooled)	2.57	0.22	254,723	2.69	0.22	126,941	4.5
- industry-level	2.57	0.22	235,113	2.69	0.22	114,978	4.5
- firm-level	2.58	0.22	19,610	2.74	0.25	11,963	6.3
individual contracts	2.43	0.26	27,314	2.51	0.26	52,770	3.3

Source: GSES 1995/2001, authors' calculations.

[10] Possible categories: "high skilled", "skilled", "semi-skilled" and "unskilled" (reference category).
[11] Remuneration by: time wage (reference category), bonus wage, piece wage, bonus- and piece wage, mixed wage.
[12] Firms are allocated according to the two digit NACE classification.
[13] Gross monthly compensation without any bonuses and premiums.

It clearly shows that workers with individual contracts get on average lower wages compared to their collectively covered colleagues whereas wage dispersion is somewhat higher. Furthermore, the wage gap between the groups of covered and non-covered workers has increased over the observed years which is due to the observation that the average wage increase of workers with individually agreed contracts (about 3.3%) is lower than the wage increase of workers equipped with industry-level contracts (about 4.5%) and particularly than the ones with firm-level contracts (about 6.3%).[14] Despite a slightly higher increase of total wages and wage dispersion of firm-level wages over time, wages of workers covered by industry-level contracts and firm-level contracts do hardly differ from each other what comes as no surprise since the wage-setting of firms using firm-level contracts usually conforms to unions' collective bargaining agreements. Figure 1 clarifies the just mentioned findings in comparing the box-plots of all wage-setting regimes in 1995 and 2001. Here, the median is displayed by the line in the middle of the box, whereas the boundaries represent the respective 25^{th} and 75^{th} percentiles. The longer the boxes and the more outliers - illustrated as circles - are present, the larger is the observed wage dispersion, respectively.

Figure 1: Boxplots of blue-collar workers' log gross hourly wages in West Germany sorted by wage-setting regime and by year.

Concerning the covariates, we focus on a comparison of characteristics between collectively covered workers and workers with individually agreed contracts since we find it reasonable on the basis of the just mentioned findings to band workers with industry-level contracts and workers with firm-level contracts together.

[14] This is also true in absolute terms.

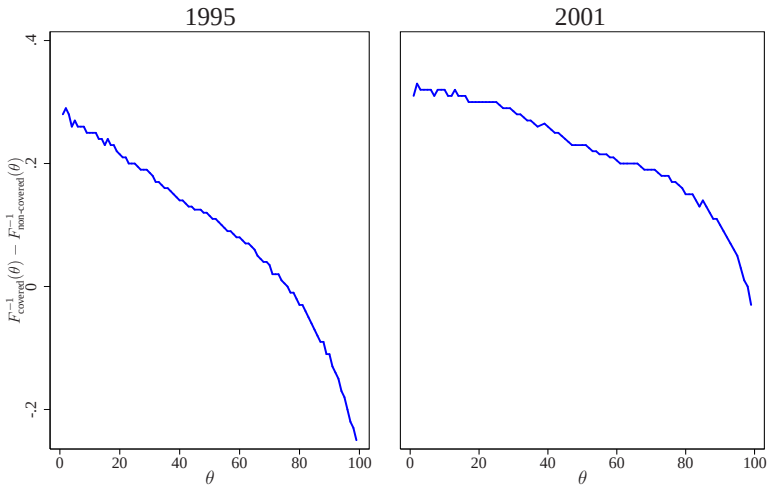

Figure 2: Quantile differences between covered and non-covered blue-collar workers' log gross hourly wages in West Germany.

An additional look at the raw difference of the wage quantiles between covered and non-covered workers is presented in figure 2. As already motivated the difference declines along the wage distribution. The difference is positive in the lower quantiles and gets even negative in 1995 from the third quartile on. In 2001 a negative difference can only be observed with the highest quantiles.

In table 4 descriptive statistics for all covariates except the industry dummies are reported. Concerning the human capital variables age, tenure and years of schooling, it becomes obvious that the only eye-catching difference between both groups of workers is given by average tenure, where covered workers' tenure is on average 3.5 - 4 years higher than the one of non-covered workers. This applies to both years 1995 and 2001. Beyond the human capital variables a remarkable difference between both groups of workers can be detected concerning the female workforce: In 1995 about 16% of all covered workers were female compared to 25% of all non-covered workers. In 2001 this share has diminished in both groups which is attributable to a lower female labour participation in the manufacturing sector. We also find that workers with individually agreed contracts are on average less skilled than their collectively covered colleagues. While in both years more than half of the former are unskilled or semi-skilled, this share among covered workers amounts to about 45% in 1995 and 40% in 2001, respectively. Accordingly, high-skilled workers are more likely to be encountered among collectively covered workers. Concerning payment rules, the distinct majority of both groups gets paid according to a time wage in both years. While there are very little exceptions among non-covered workers -

especially in 2001 - virtually one of four covered workers is rewarded by an alternative payment rule like a bonus wage. The theoretical considerations concerning the connection between firm size and collective coverage of firms are confirmed by our empirical findings: While roughly three out of four non-covered workers are mainly employed in firms up to 199 employees in 2001, this share among covered workers amounts to merely 35.5% in the same year. Further it becomes obvious that the share of non-covered workers in firms with more than 1,000 employees is relatively small (1995: 11%; 2001: 7%), whereas almost one third of all covered workers are employed in a large firm. Finally, concerning the age structure among the two groups it seems as younger workers tend to be rather equipped with individual contracts whereas aged employees are more likely to be paid according to a collective contract.

Above findings are well suited to describe the average differences between both groups' characteristics and thus to provide some hints for the explanation of the total covered- non-covered wage gap. However, to identify the impact of groups' characteristics on wages at various points of the wage distribution quantile regression coefficients need to be estimated. Estimation results for all explanatory variables are reported separately for each group, for each of the previously introduced models and sorted by years in tables (5)-(16). Exemplary, the human capital variables, the returns to female workers - available only for model 2 and 3 - and the constant representing a kind of base wage are additionally pictured in an analogous order in figures (3)-(8). Among the human capital variables it becomes obvious that tenure has by far the strongest impact on wages in both groups. However, in accordance with related literature like in Fitzenberger et al. (2007) tenure tends to be of particularly high importance for non-covered workers: we find in all three models unambiguously evidence that returns to tenure are highest for non-covered low-wage workers and lowest for covered high-wage workers, i.e. that a long tenure is most advantageous for low-wage workers with individually agreed contracts and of inferior importance for covered high-wage workers, respectively. In contrast, but not surprisingly, we find much lower returns to female non-covered workers compared to their covered counterparts. Model 2 shows particularly for non-covered low-wage female workers in 2001 a highly negative impact on wages whereas covered high-wage female workers (model 3, 2001) suffer least from wage discrimination. In comparing both groups' base wages, all three models make clear that base wages of covered standard workers are definitively higher than the ones of uncovered workers. Model 3, e.g., reports for 2001 log base wages of 2.0 in the bottom part and 2.6 in the top part of covered wage distributions. Uncovered base wages range merely from 1.9 to 2.2.

We now turn to the analysis of the components of between-groups' wage differentials. Table 2 reports the decomposition results of the difference between groups' average log gross hourly

Table 2: Blinder-Oaxaca-Decomposition of workers' log gross hourly wages in West Germany, 1995 and 2001

	1995			2001		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
total log wage difference	0.143	0.143	0.143	0.182	0.182	0.182
explained by characteristics	0.030	0.059	0.098	0.035	0.066	0.107
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
explained by bargaining	0.113	0.084	0.045	0.147	0.116	0.075
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
number of observations	282,037	282,037	282,037	179,711	179,711	179,711

p values based on bootstrapped standard errors (500 replications) in parentheses;

* significant at 10% ** significant at 5%; *** significant at 1%; Source: GSES 1995/2001, authors' calculations.

wages according to the Blinder-Oaxaca-Decomposition given by equation (1). It becomes obvious that the total log wage spread between covered and non-covered workers has on average widened over the observed years from 0.143 (conforms to 1.15 €) in 1995 to 0.182 (conforms to 1.20 €) in 2001. Model 1 using only human capital variables, explains these wage differentials mainly by the bargaining effect which reflects in our study the amount of the wage gap that is due to the coverage by a collective contract. In both years it accounts for about four fifth of the total wage gap. However, the relative importance of the characteristics effect specifying the justified wage differential rises if further explaining variables are considered like in model 2. Including all available explaining variables, the characteristics effect even exceeds the bargaining effect (model 3), i.e. that the average log wage advantage of covered workers of 0.182 in 2001 compared to their non-covered counterparts is particularly due to their characteristics and only to a minor part to coverage (characteristics: 0.107; bargaining: 0.075). Furthermore, it becomes obvious that the increase of the total wage gap in 2001 is mostly explained by the bargaining effect and is consequently only to a minor part attributable to the characteristics effect.

However, if not only mean effects are considered in order to explain the covered- non-covered wage differential, we detect substantial differences within groups' wage distributions as can be seen in figures (9)-(14) where all results are based on Melly's decomposition technique for quantile regressions. All three models show unambiguously for both years that the bargaining effect is highest in the lower parts of groups' wage distributions whereas it decreases steadily with increasing wages. In 1995, it appears that the bargaining effect runs out of significance[15] in the upper quantiles in model 1. Since the level of the bargaining effect decreases with more variables included, it becomes insignificant in the upper half of the wage distribution in model 2 and is almost completely insignificant in model 3. A comparison with the models 1-3 in 2001

[15] A significance level of $\alpha = 0.05$ is assumed.

clearly indicates a strengthening of the bargaining effect as its total level rises in all parts of the respective wage distributions.

Unlike the bargaining effect the characteristics effect is in all three models of both years highly significant and positive at any point of the wage distributions. Good characteristics pay off most for high-wage workers even though the characteristics effect increases only slightly across the wage distributions. Since the main portion of the total wage gap increase in 2001 is attributable to the bargaining effect, it comes as no surprise that the characteristics effect has virtually not changed over time.

Summing up, it can be ascertained that the total wage gap between covered and non-covered workers is for low-wage workers particularly due to collective coverage whereas individual characteristics are of minor importance. In contrast, the relative importance of individual characteristics rises with increasing workers' remuneration so that the wage advantage of covered high-wage workers compared to their non-covered colleagues results mostly from better characteristics and is only to a minor part attributable to the coverage status. However, since the widening of the wage gap over time is mostly explained by the bargaining effect, the relative importance of coverage gains weight over time.

5 Conclusions and Outlook

This paper investigates the covered- non-covered wage gap in Germany. Descriptive Evidence using the GSES reports a gap of approximately 1.15 € in 1995 which increases to 1.20 € in 2001. Theoretical considerations point out that this gap might result from union bargaining as well as from a non-random selection of workers into covered and non-covered firms, respectively. Using the Melly (2006) estimator which follows the Machado/Mata (2005) decomposition technique, it could be shown that the covered- non-covered wage gap results from two parts. The union bargaining effect is highest for workers in the lowest quantiles and decreases steadily in higher quantiles. This confirms the hypotheses that unions aim to compress the wage distribution especially for low-skilled workers. The highly significant characteristics effect can be interpreted as a result from the underlying selection of higher skilled workers in covered firms. In finding higher base wages and reduced returns to human capital for covered workers as unions narrow inequality across skill groups our results are in accordance to the related studies for Germany (cf. Fitzenberger et al. 2007, Stephan/Gerlach 2005).

Since the GSES does not only provide information about blue-collar workers in West Germany, the objective of prospective analysis could focus on the examination of the covered-non-covered wage gap of white-collar workers including employees in East Germany. Further, this study considers only collective and individual bargaining agreements. Unfortunately the GSES has no panel dimension to control for unobservable heterogeneity. However, more flexible wage-setting regimes increasingly become important that should also be taken into account in future analysis.

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A Decomposition of Wage Differences Across Wage Distributions

Blinder-Oaxaca-Decomposition

To quantify the components of a wage gap between two groups Blinder (1973) and Oaxaca (1973) first developed a decomposition technique that detects the sources of the difference in the means. This approach proved to be particularly useful in explaining the differences in average log wages $\bar{Y}_t$ between two groups $t = (0; 1)$, i.e. between a favoured or treated group indexed with $t = 1$ and a discriminated or non-treated group indexed with $t = 0$.

By assuming that the expected value of Y conditionally on X is a linear function of X, $E[Y_t|T = t]$ can be estimated consistently via OLS by $\bar{X}_t\hat{\beta}_t$, where the groups' average characteristics $\bar{X}_t$ can be obtained by $\frac{1}{n_t}\sum_{i:T=t} X_i$ and the corresponding coefficients $\hat{\beta}_t$ are resulting from the regressions of Y_t on X_t. Then, since $\bar{Y}_t = \bar{X}_t\hat{\beta}_t$, the difference between $\bar{Y}_1$ and $\bar{Y}_0$ can be written as

$$\bar{Y}_1 - \bar{Y}_0 = \bar{X}_1\hat{\beta}_1 - \bar{X}_0\hat{\beta}_0. \tag{3}$$

Addition and simultaneous subtraction of the counterfactual $\bar{X}_0\hat{\beta}_1$ gives

$$\bar{Y}_1 - \bar{Y}_0 = \bar{X}_1\hat{\beta}_1(-\bar{X}_0\hat{\beta}_1 + \bar{X}_0\hat{\beta}_1) - \bar{X}_0\hat{\beta}_0. \tag{4}$$

Then, the Blinder-Oaxaca-Decomposition is given by

$$\bar{Y}_1 - \bar{Y}_0 = \underbrace{(\bar{X}_1\hat{\beta}_1 - \bar{X}_0\hat{\beta}_1)}_{\text{characteristics}} + \underbrace{(\bar{X}_0\hat{\beta}_1 - \bar{X}_0\hat{\beta}_0)}_{\text{coefficients}}. \tag{5}$$

Alternatively, the difference between $\bar{Y}_0$ and $\bar{Y}_1$ can be decomposed in an analogous way as

$$\bar{Y}_0 - \bar{Y}_1 = \underbrace{(\bar{X}_0\hat{\beta}_0 - \bar{X}_1\hat{\beta}_0)}_{\text{characteristics}} + \underbrace{(\bar{X}_1\hat{\beta}_0 - \bar{X}_1\hat{\beta}_1)}_{\text{coefficients}}. \tag{6}$$

By introducing the counterfactuals $\bar{X}_0\hat{\beta}_1$ as well as $\bar{X}_1\hat{\beta}_0$, Blinder (1973) and Oaxaca (1973) showed that not only the characteristics of individuals but also the simple belonging to a group

determines the magnitude of the resulting wages. In the literature these two effects are commonly known as characteristics effect - given by the first bracket in equations (5) and (6) - and as coefficients effect - the term in the second bracket in (5) and (6). The characteristics effect reflects the justified wage differential between both groups due to different productivities depending on the groups' characteristics whereas the rest of the observable wage gap is contributable to the coefficients effect which honors the simple belonging to the treated group or punishes the simple belonging to the non-treated group. This becomes clear if e.g. equation (5) is rewritten as

$$\bar{Y_1} - \bar{Y_0} = \underbrace{(\bar{X}_1 - \bar{X}_0)\hat{\beta}_1}_{\text{characteristics}} + \underbrace{(\hat{\beta}_1 - \hat{\beta}_0)\bar{X}_0}_{\text{coefficients}}. \tag{7}$$

Machado-Mata-Decomposition

Machado/Mata (2005) present an estimator using quantile regression to decompose differences in log wages between two groups since this overcomes the large waste of information if not only means of variables are considered but also differences at various quantiles of distributions can be analysed. Another important feature of quantile regression is its robustness against outliers. Assuming linearity between the quantiles of the dependent variable Y and the covariates X, then the τ^{th} conditional quantile of Y is given by

$$Q_Y(\tau|X) = X\beta(\tau), \qquad \forall\tau \in (0,1). \tag{8}$$

Koenker/Bassett (1978) solve by minimizing in $\beta(\tau)$

$$\hat{\beta}(\tau) = \min_{\beta\in\mathbb{R}^K} n^{-1}\left[\sum_i^n \rho_\tau(Y_i - X_i\beta)\right], \qquad (i = 1, ..., n), \tag{9}$$

where the check function ρ_τ weights asymmetrically the residuals u_i so that

$$\rho_\tau(u_i) = \begin{cases} \tau u_i & \text{for } u_i \geq 0 \\ (\tau - 1)u_i & \text{for } u_i < 0 \end{cases} \tag{10}$$

Following Machado/Mata (2005) who propose an estimator of counterfactual unconditional wage distributions based on quantile regressions, the difference of the θ^{th} unconditional quantile

between two groups' distributions can be decomposed according to Blinder and Oaxaca (1973) as

$$\begin{aligned}\hat{F}_{Y_1}^{-1}(\theta|T=1) - \hat{F}_{Y_0}^{-1}(\theta|T=0) &= \underbrace{\hat{F}_{Y_1}^{-1}(\theta|T=1) - \hat{F}_{Y_1}^{-1}(\theta|T=0)}_{\text{characteristics}} \\ &+ \underbrace{\hat{F}_{Y_1}^{-1}(\theta|T=0) - \hat{F}_{Y_0}^{-1}(\theta|T=0)}_{\text{coefficients}},\end{aligned} \tag{11}$$

or inversely as

$$\begin{aligned}\hat{F}_{Y_0}^{-1}(\theta|T=0) - \hat{F}_{Y_1}^{-1}(\theta|T=1) &= \underbrace{\hat{F}_{Y_0}^{-1}(\theta|T=0) - \hat{F}_{Y_0}^{-1}(\theta|T=1)}_{\text{characteristics}} \\ &+ \underbrace{\hat{F}_{Y_0}^{-1}(\theta|T=1) - \hat{F}_{Y_1}^{-1}(\theta|T=1)}_{\text{coefficients}},\end{aligned} \tag{12}$$

where $\hat{F}_{Y_t}^{-1}(\theta|T=t)$ denotes the θ^{th} unconditional quantile of group t's wage. Again, the unconditional counterfactual quantiles $\hat{F}_{Y_1}^{-1}(\theta|T=0)$ as well as $\hat{F}_{Y_0}^{-1}(\theta|T=1)$ in the terms on the right hand side of (11) and (12) are needed to detect the mentioned effects at any unconditional quantile. Even though an appropriate method of consistently estimating the variance is not presented in Machado's and Mata's (2005) pioneer work, several authors make use of this decomposition technique in their applications (cf. e.g. Albrecht et al. 2003, 2004, Kohn 2006). But more importantly, Melly (2006) shows that their estimator only yields good MSE-properties if the number of quantile regression coefficients m is large or goes at best to infinity since its variance vanishes.[16] So if a data set is relatively small, one can increase m without losing too much computation time. However, many applications like ours are based on large or even huge data sets for which choosing the right m is a sensitive question since estimation time depends crucially on m and n. The situation even worsens if the standard errors need to be bootstrapped in order to obtain reliable inference statistics. In our application we forgo bootstrapping since computation is simply infeasible. We computed analytic standard errors using the Hendricks-Koenker-sandwich estimator (Hendricks/Koenker 1992) employing Hall/Sheather (1988) rule for optimal bandwith.

[16] If $m \to \infty$, the MSE of Machado's and Mata's estimator (MSE_{MM}) reduces to the bias that does not depend on m.

For this reason Melly (2006) presents an alternative estimator of counterfactual unconditional distributions that copes with this challenge. On the one hand he shows that Machado's and Mata's estimator is numerically equivalent to his own estimator if m goes to infinity. On the other hand - and most importantly for applications using large data sets - he proves that the MSE of his estimator (MSE_{Melly}) does, in contrast to MSE_{MM}, not depend on m and thus $MSE_{\text{Melly}} \leq MSE_{\text{MM}}$.[17] In a nutshell, decomposition analysis based on quantile regression technique using large data sets become feasible. Since Melly's estimator of counterfactual unconditional distributions is relatively new and the basis of our application, the formal proceeding is briefly presented in the following.

After having estimated all conditional quantiles of Y given X by linear quantile regression, Melly (2006) executes several calculation steps in order to obtain the unconditional quantiles of interest: For this purpose, he first estimates the conditional distribution of Y_t given X_i at q[18] by

$$\hat{F}_{Y_t}(q|X_i) = \int_0^1 1(X_i\hat{\beta}_t(\tau) \leq q)\, d\tau = \sum_{j=1}^{J}(\tau_j - \tau_{j-1})1(X_i\hat{\beta}_t(\tau_j) \leq q), \tag{13}$$

since is not possible to simply integrate the conditional quantile function for lack of monotonicity. The magnitude of the expression $(\tau_j - \tau_{j-1})$ in equation (13) diminishes by nature with growing m. As m equals 100 in our application, we assume $(\tau_j - \tau_{j-1})$ to take a constant value of 0.01.

Having once estimated the conditional distribution of Y_t, the unconditional distribution functions can easily be computed in a second step by

$$\hat{F}_{Y_t}(q|T = t) = \frac{1}{n_t}\sum_{i:T_i=t}\hat{F}_{Y_t}(q|X_i). \tag{14}$$

[17] A comparison of the Mean Squared Errors (MSE) of both estimators displayed as Relative MSE $\frac{MSE_{\text{MM}}}{MSE_{\text{Melly}}}$ shows that for $m = n = 400$ the MSE_{MM} is more than twice as large as the MSE_{Melly} and respectively for $m = 1000$ still 1.5-times as large (cf. Melly 2006, p. 41).

[18] q is previously specified and serves as auxiliary tool for the estimation of the conditional distribution function.

Then, the unconditional quantiles $\hat{q}_t(\theta)$ as well as the unconditional counterfactual quantiles $\hat{q}_{c_1}(\theta)$ - based on $X_0\hat{\beta}_1(\tau)$ - and $\hat{q}_{c_0}(\theta)$ - based on $X_1\hat{\beta}_0(\tau)$ - are given by equations (15), (16) and (17), respectively:

$$\hat{q}_t(\theta) = \inf\{q : \frac{1}{n_t} \sum_{i:T_i=t} \hat{F}_{Y_t}(q|X_i) \geq \theta\} \tag{15}$$

$$\hat{q}_{c_1}(\theta) = \inf\{q : \frac{1}{n_0} \sum_{i:T_i=0} \hat{F}_{Y_1}(q|X_i) \geq \theta\} \tag{16}$$

$$\hat{q}_{c_0}(\theta) = \inf\{q : \frac{1}{n_1} \sum_{i:T_i=1} \hat{F}_{Y_0}(q|X_i) \geq \theta\} \tag{17}$$

Finally, the difference between the θ^{th} unconditional quantiles of both groups can be decomposed in analogy to Blinder (1973) and Oaxaca (1973) as

$$\hat{q}_1(\theta) - \hat{q}_0(\theta) = \underbrace{(\hat{q}_1(\theta) - \hat{q}_{c_1}(\theta))}_{\text{characteristics}} + \underbrace{(\hat{q}_{c_1}(\theta) - \hat{q}_0(\theta))}_{\text{coefficients}}, \tag{18}$$

or alternatively as

$$\hat{q}_0(\theta) - \hat{q}_1(\theta) = \underbrace{(\hat{q}_0(\theta) - \hat{q}_{c_0}(\theta))}_{\text{characteristics}} + \underbrace{(\hat{q}_{c_0}(\theta) - \hat{q}_1(\theta))}_{\text{coefficients}}. \tag{19}$$

B Tables

Table 3: Description of variables

Variable label	Variable description
age/10	worker's age/10 in years
$(age/10)^2$	worker's age/10 squared
tenure/10	worker's tenure/10 in years
$(tenure/10)^2$	worker's tenure/10 squared
years of schooling	worker's years of schooling
Dummies	
female	female worker
married	married worker
unskilled worker	labourer without special skills
semi-skilled worker	worker without special skills but more than three months of tenure
skilled workers	worker with vocational education or longtime tenure
high-skilled worker	worker with excellent skills and longtime tenure
time wage	worker is exclusively paid according to working time
bonus wage	worker is paid according to working time and bonus premia, e.g. for product quantity or quality, respectively
piece wage	worker is paid according to product quantity within a predetermined period
bonus- and piece wage	worker is paid according to a mixture of bonus- and piece wage
mixed wage	worker is paid according to a mixture of time wage and bonus wage or piece wage
firm size with 100-199 employees	share of firms with 100-199 employees
firm size with 200-499 employees	share of firms with 200-499 employees
firm size with 500-999 employees	share of firms with 500-999 employees
firm size with 1000 or more employees	share of firms with 1000 or more employees
share of female	share of female workers at firm-level
share of unskilled	share of unskilled workers at firm-level
share of semi-skilled	share of semi-skilled workers at firm-level
share of skilled	share of skilled workers at firm-level
share of high-skilled	share of high-skilled workers at firm-level
share of workers younger than 25 years	share of workers < 25 years at firm-level
share of workers between 25 and 30 years	share of workers between 25 and 30 years at firm-level
share of workers between 30 and 35 years	share of workers between 30 and 35 years at firm-level
share of workers between 35 and 40 years	share of workers between 35 and 40 years at firm-level
share of workers between 40 and 45 years	share of workers between 40 and 45 years at firm-level
share of workers between 45 and 50 years	share of workers between 45 and 50 years at firm-level
share of workers with more than 50 years	share of workers > 50 years at firm-level
firm in Hamburg or Schleswig-Holstein	firm located in Hambourg or Schleswig-Holstein
firm in Lower Saxony or Bremen	firm located in Lower Saxony or Bremen
firm in North Rhine-Westphalia	firm located in North Rhine-Westphalia
firm in Hesse	firm located in Hesse
firm in Rhineland-Palatinate or Saarland	firm located in Rhineland-Palatinate or Saarland
firm in Bavaria	firm located in Bavaria
firm in Baden-Württemberg	firm located in Baden-Württemberg

Table 4: Deskriptive Statistics for covariates in 1995 and 2001

		individual			collective			total		
Variable	year	mean	sd	d9/d1	mean	sd	d9/d1	mean	sd	d9/d1
gross hourly wages	1995	11.73	3.09	1.95	13.40	2.95	1.72	13.24	3.00	1.76
	2001	12.72	3.38	1.90	15.12	3.43	1.71	14.41	3.59	1.85
log gross hourly wages	1995	2.43	0.26	1.32	2.57	0.22	1.24	2.56	0.22	1.25
	2001	2.51	0.26	1.29	2.69	0.22	1.22	2.64	0.25	1.26
age/10	1995	3.81	1.07	2.18	3.93	1.07	2.12	3.92	1.07	2.12
	2001	3.95	1.04	2.09	4.05	1.00	2.01	4.02	1.02	2.04
tenure/10	1995	0.87	0.84	37.00	1.21	0.95	18.29	1.18	0.94	19.13
	2001	0.81	0.82	34.71	1.23	0.97	23.21	1.10	0.95	27.55
years of schooling	1995	10.38	0.85	1.16	10.46	0.81	1.16	10.45	0.82	1.16
	2001	10.39	0.94	1.22	10.52	0.84	1.16	10.49	0.87	1.16
female	1995	0.248	0.432		0.163	0.369		0.171	0.376	
	2001	0.167	0.373		0.117	0.321		0.131	0.338	
unskilled worker	1995	0.228	0.420		0.178	0.382		0.183	0.387	
	2001	0.217	0.412		0.140	0.347		0.163	0.369	
semi-skilled worker	1995	0.334	0.472		0.275	0.447		0.281	0.449	
	2001	0.322	0.467		0.257	0.437		0.276	0.447	
skilled worker	1995	0.335	0.472		0.344	0.475		0.343	0.475	
	2001	0.370	0.483		0.359	0.480		0.362	0.481	
high-skilled worker	1995	0.103	0.304		0.203	0.402		0.193	0.395	
	2001	0.091	0.288		0.244	0.430		0.199	0.399	
firm size with 100-199 employees	1995	0.377	0.485		0.158	0.365		0.179	0.384	
	2001	0.768	0.422		0.355	0.479		0.476	0.499	
firm size with 200-499 employees	1995	0.368	0.482		0.316	0.465		0.321	0.467	
	2001	0.125	0.330		0.198	0.398		0.176	0.381	
firm size with 500-999 employees	1995	0.147	0.354		0.214	0.410		0.207	0.405	
	2001	0.035	0.183		0.131	0.337		0.103	0.304	
firm size with 1000 or	1995	0.108	0.310		0.312	0.463		0.292	0.455	
more employees	2001	0.073	0.260		0.316	0.465		0.245	0.430	
share of . . .										
. . . female workers	1995	0.283	0.224		0.203	0.187		0.211	0.193	
	2001	0.210	0.212		0.161	0.166		0.175	0.182	
. . . unskilled workers	1995	0.173	0.199		0.138	0.174		0.141	0.177	
	2001	0.166	0.212		0.116	0.164		0.131	0.181	
. . . semi-skilled workers	1995	0.253	0.204		0.216	0.172		0.220	0.175	
	2001	0.253	0.217		0.204	0.188		0.218	0.198	
. . . skilled workers	1995	0.257	0.195		0.272	0.193		0.271	0.193	
	2001	0.289	0.235		0.282	0.217		0.284	0.223	
. . . high-skilled workers	1995	0.085	0.153		0.151	0.160		0.145	0.161	
	2001	0.086	0.148		0.181	0.193		0.153	0.186	
. . . workers younger than 25 years	1995	0.104	0.072		0.075	0.051		0.078	0.054	
	2001	0.085	0.080		0.064	0.057		0.070	0.065	
. . . workers between 25 and 30 years	1995	0.177	0.074		0.156	0.063		0.158	0.064	
	2001	0.117	0.083		0.100	0.064		0.105	0.071	
. . . workers between 30 and 35 years	1995	0.176	0.067		0.173	0.060		0.174	0.061	
	2001	0.162	0.087		0.154	0.070		0.156	0.076	
. . . workers between 35 and 40 years	1995	0.145	0.058		0.148	0.053		0.148	0.053	
	2001	0.177	0.088		0.184	0.071		0.182	0.076	
. . . workers between 40 and 45 years	1995	0.124	0.056		0.128	0.051		0.128	0.052	
	2001	0.155	0.084		0.163	0.069		0.161	0.074	
. . . workers between 45 and 50 years	1995	0.103	0.055		0.116	0.050		0.115	0.051	
	2001	0.125	0.078		0.135	0.067		0.132	0.070	
. . . workers with more than 50 years	1995	0.170	0.097		0.203	0.096		0.200	0.097	
	2001	0.178	0.117		0.201	0.104		0.194	0.109	
observations	1995		27,314			254,723			282,037	
	2001		52,770			126,941			179,711	

Table 5: Quantile regression coefficients for *covered* workers, *Model 1, 1995*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.0765	0.0950	0.1196	0.1242	0.1192
	(0.0060)	(0.0037)	(0.0035)	(0.0037)	(0.0053)
$(age/10)^2$	-0.0111	-0.0131	-0.0158	-0.0164	-0.0151
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
tenure/10	0.1497	0.1393	0.1330	0.1324	0.1285
	(0.0026)	(0.0016)	(0.0015)	(0.0016)	(0.0024)
$(tenure/10)^2$	-0.0230	-0.0212	-0.0202	-0.0201	-0.0190
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0003)
years of schooling	0.0809	0.0801	0.0735	0.0693	0.0676
	(0.0012)	(0.0006)	(0.0005)	(0.0006)	(0.0008)
firm in Hamburg or Schleswig-Holstein	-0.0217	-0.0205	-0.0192	-0.0189	-0.0045
	(0.0036)	(0.0022)	(0.0023)	(0.0028)	(0.0040)
firm in Lower Saxony or Bremen	-0.0649	-0.0648	-0.0748	-0.0851	-0.0888
	(0.0025)	(0.0019)	(0.0016)	(0.0019)	(0.0022)
firm in North Rhine-Westphalia	-0.0372	-0.0365	-0.0396	-0.0441	-0.0357
	(0.0019)	(0.0012)	(0.0012)	(0.0013)	(0.0018)
firm in Hesse	-0.0351	-0.0424	-0.0537	-0.0655	-0.0701
	(0.0023)	(0.0016)	(0.0017)	(0.0016)	(0.0025)
firm in Rhineland-Palatinate or Saarland	-0.0524	-0.0502	-0.0518	-0.0503	-0.0501
	(0.0032)	(0.0020)	(0.0017)	(0.0018)	(0.0026)
firm in Bavaria	-0.0925	-0.0828	-0.0862	-0.0954	-0.1027
	(0.0019)	(0.0011)	(0.0010)	(0.0012)	(0.0017)
firm in Baden-Württemberg (reference)					
Constant	1.2860	1.3801	1.5283	1.6928	1.8298
	(0.0007)	(0.0005)	(0.0005)	(0.0005)	(0.0007)
Observations	254,723	254,723	254,723	254,723	254,723
Pseudo R^2	0.111	0.113	0.107	0.099	0.092

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 6: Quantile regression coefficients for *non-covered* workers, *Model 1, 1995*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1112	0.1220	0.1531	0.1638	0.1646
	(0.0102)	(0.0110)	(0.0117)	(0.0114)	(0.0141)
$(age/10)^2$	-0.0158	-0.0171	-0.0199	-0.0205	-0.0202
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
tenure/10	0.2153	0.2122	0.2000	0.1773	0.1528
	(0.0044)	(0.0047)	(0.0052)	(0.0056)	(0.0083)
$(tenure/10)^2$	-0.0337	-0.0330	-0.0317	-0.0273	-0.0212
	(0.0004)	(0.0002)	(0.0006)	(0.0006)	(0.0010)
years of schooling	0.0925	0.1025	0.0975	0.1001	0.0975
	(0.0022)	(0.0021)	(0.0017)	(0.0019)	(0.0023)
firm in Hamburg or Schleswig-Holstein	-0.0085	0.0212	0.0323	0.0220	0.0194
	(0.0103)	(0.0077)	(0.0058)	(0.0085)	(0.0082)
firm in Lower Saxony or Bremen	-0.0787	-0.0717	-0.0670	-0.0477	-0.0276
	(0.0042)	(0.0053)	(0.0059)	(0.0055)	(0.0065)
firm in North Rhine-Westphalia	-0.0485	-0.0286	-0.0161	-0.0108	-0.0056
	(0.0045)	(0.0051)	(0.0050)	(0.0048)	(0.0066)
firm in Hesse	-0.0219	-0.0096	-0.0199	-0.0185	-0.0322
	(0.0044)	(0.0047)	(0.0041)	(0.0057)	(0.0075)
firm in Rhineland-Palatinate or Saarland	-0.0168	0.0057	0.0128	0.0500	0.0435
	(0.0051)	(0.0065)	(0.0043)	(0.0065)	(0.0047)
firm in Bavaria	-0.1057	-0.0963	-0.0967	-0.1031	-0.1053
	(0.0028)	(0.0039)	(0.0048)	(0.0044)	(0.0061)
firm in Baden-Württemberg (reference)					
Constant	0.9166	0.9172	1.0404	1.1283	1.2963
	(0.0013)	(0.0015)	(0.0015)	(0.0015)	(0.0020)
Observations	27,314	27,314	27,314	27,314	27,314
Pseudo R^2	0.157	0.164	0.16	0.146	0.13

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 7: Quantile regression coefficients for *covered* workers, *Model 1, 2001*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1284	0.1221	0.1269	0.1232	0.1323
	(0.0089)	(0.0055)	(0.0051)	(0.0059)	(0.0078)
$(age/10)^2$	-0.0178	-0.0162	-0.0164	-0.0157	-0.0161
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
tenure/10	0.1561	0.1364	0.1239	0.1148	0.1063
	(0.0033)	(0.0025)	(0.0019)	(0.0024)	(0.0034)
$(tenure/10)^2$	-0.0259	-0.0220	-0.0188	-0.0173	-0.0166
	(0.0003)	(0.0003)	(0.0002)	(0.0002)	(0.0003)
years of schooling	0.0578	0.0576	0.0582	0.0576	0.0592
	(0.0015)	(0.0009)	(0.0007)	(0.0008)	(0.0012)
firm in Hamburg or Schleswig-Holstein	-0.0407	-0.0347	-0.0382	-0.0217	0.0253
	(0.0048)	(0.0034)	(0.0032)	(0.0039)	(0.0066)
firm in Lower Saxony or Bremen	-0.0405	-0.0516	-0.0618	-0.0651	-0.0635
	(0.0033)	(0.0023)	(0.0020)	(0.0023)	(0.0034)
firm in North Rhine-Westphalia	-0.0473	-0.0479	-0.0544	-0.0574	-0.0517
	(0.0028)	(0.0019)	(0.0017)	(0.0021)	(0.0029)
firm in Hesse	-0.0157	-0.0248	-0.0395	-0.0675	-0.0719
	(0.0032)	(0.0028)	(0.0021)	(0.0023)	(0.0032)
firm in Rhineland-Palatinate or Saarland	-0.0385	-0.0413	-0.0434	-0.0580	-0.0655
	(0.0031)	(0.0025)	(0.0019)	(0.0021)	(0.0031)
firm in Bavaria	-0.0504	-0.0623	-0.0664	-0.0710	-0.0675
	(0.0024)	(0.0017)	(0.0017)	(0.0023)	(0.0027)
firm in Baden-Württemberg (reference)					
Constant	1.5360	1.6707	1.7872	1.9389	2.0219
	(0.0010)	(0.0007)	(0.0006)	(0.0007)	(0.0010)
Observations	126,941	126,941	126,941	126,941	126,941
Pseudo R^2	0.092	0.088	0.082	0.071	0.061

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 8: Quantile regression coefficients for *non-covered* workers, *Model 1, 2001*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1403	0.1544	0.1764	0.1943	0.1884
	(0.0110)	(0.0086)	(0.0068)	(0.0088)	(0.0124)
$(age/10)^2$	-0.0193	-0.0201	-0.0215	-0.0225	-0.0217
	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)
tenure/10	0.1856	0.1827	0.1547	0.1355	0.1555
	(0.0051)	(0.0036)	(0.0033)	(0.0044)	(0.0055)
$(tenure/10)^2$	-0.0283	-0.0285	-0.0231	-0.0180	-0.0231
	(0.0006)	(0.0004)	(0.0004)	(0.0006)	(0.0006)
years of schooling	0.0663	0.0726	0.0754	0.0690	0.0658
	(0.0022)	(0.0015)	(0.0010)	(0.0004)	(0.0018)
firm in Hamburg or Schleswig-Holstein	-0.0314	-0.0094	0.0258	0.0702	0.0929
	(0.0058)	(0.0047)	(0.0044)	(0.0058)	(0.0075)
firm in Lower Saxony or Bremen	-0.0745	-0.0565	-0.0502	-0.0488	-0.0628
	(0.0050)	(0.0040)	(0.0032)	(0.0043)	(0.0055)
firm in North Rhine-Westphalia	-0.0217	-0.0144	-0.0148	-0.0141	-0.0119
	(0.0035)	(0.0035)	(0.0025)	(0.0035)	(0.0054)
firm in Hesse	-0.0195	-0.0056	-0.0020	0.0009	-0.0018
	(0.0063)	(0.0045)	(0.0034)	(0.0037)	(0.0047)
firm in Rhineland-Palatinate or Saarland	-0.0757	-0.0385	-0.0269	-0.0160	-0.0025
	(0.0057)	(0.0035)	(0.0036)	(0.0040)	(0.0066)
firm in Bavaria	-0.0740	-0.0590	-0.0458	-0.0468	-0.0563
	(0.0053)	(0.0026)	(0.0030)	(0.0031)	(0.0043)
firm in Baden-Württemberg (reference)					
Constant	1.2367	1.2536	1.3101	1.4646	1.6378
	(0.0015)	(0.0011)	(0.0010)	(0.0011)	(0.0017)
Observations	52,770	52,770	52,770	52,770	52,770
Pseudo R^2	0.102	0.12	0.119	0.11	0.108

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 9: Quantile regression coefficients for *covered* workers, *Model 2, 1995*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.0736	0.0742	0.0716	0.0640	0.0538
	(0.0050)	(0.0028)	(0.0023)	(0.0035)	(0.0071)
$(age/10)^2$	-0.0092	-0.0094	-0.0095	-0.0087	-0.0071
	(0.0043)	(0.0031)	(0.0029)	(0.0034)	(0.0049)
tenure/10	0.0859	0.0792	0.0837	0.0872	0.0795
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$(tenure/10)^2$	-0.0162	-0.0144	-0.0148	-0.0149	-0.0125
	(0.0017)	(0.0012)	(0.0013)	(0.0015)	(0.0022)
years of schooling	0.0165	0.0149	0.0178	0.0207	0.0236
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
female	-0.1947	-0.1752	-0.1540	-0.1583	-0.1579
	(0.0007)	(0.0005)	(0.0005)	(0.0006)	(0.0008)
married	0.0269	0.0238	0.0245	0.0241	0.0212
	(0.0016)	(0.0015)	(0.0011)	(0.0012)	(0.0018)
unskilled worker (reference)					
semi-skilled worker	0.0532	0.0567	0.0655	0.0679	0.0660
	(0.0010)	(0.0008)	(0.0008)	(0.0009)	(0.0013)
skilled worker	0.1325	0.1324	0.1358	0.1369	0.1424
	(0.0016)	(0.0013)	(0.0012)	(0.0013)	(0.0017)
high-skilled worker	0.2344	0.2283	0.2304	0.2367	0.2512
	(0.0012)	(0.0009)	(0.0008)	(0.0010)	(0.0013)
time wage (preference)					
bonus wage	0.0114	0.0201	0.0359	0.0394	0.0309
	(0.0011)	(0.0009)	(0.0010)	(0.0012)	(0.0017)
piece wage	0.1069	0.1235	0.1243	0.1044	0.0793
	(0.0016)	(0.0013)	(0.0013)	(0.0014)	(0.0019)
bonus- and piece wage	0.0757	0.0782	0.0808	0.0614	0.0384
	(0.0016)	(0.0012)	(0.0010)	(0.0010)	(0.0014)
mixed wage	0.0124	0.0179	0.0172	0.0112	0.0068
	(0.0083)	(0.0060)	(0.0055)	(0.0046)	(0.0066)
firm in Hamburg or Schleswig-Holstein	-0.0480	-0.0445	-0.0432	-0.0442	-0.0282
	(0.0030)	(0.0019)	(0.0016)	(0.0022)	(0.0028)
firm in Lower Saxony or Bremen	-0.0643	-0.0683	-0.0807	-0.0902	-0.0942
	(0.0021)	(0.0019)	(0.0020)	(0.0025)	(0.0033)
firm in North Rhine-Westphalia	-0.0485	-0.0445	-0.0441	-0.0384	-0.0211
	(0.0019)	(0.0013)	(0.0012)	(0.0015)	(0.0022)
firm in Hesse	-0.0543	-0.0627	-0.0749	-0.0779	-0.0753
	(0.0013)	(0.0010)	(0.0010)	(0.0011)	(0.0016)
firm in Rhineland-Palatinate or Saarland	-0.0433	-0.0358	-0.0456	-0.0521	-0.0572
	(0.0015)	(0.0013)	(0.0012)	(0.0015)	(0.0021)
firm in Bavaria	-0.0868	-0.0883	-0.0959	-0.1012	-0.0952
	(0.0021)	(0.0014)	(0.0013)	(0.0018)	(0.0020)
firm in Baden-Württemberg (reference)					
Constant	1.9393	2.0443	2.1144	2.2101	2.2979
	(0.0011)	(0.0009)	(0.0009)	(0.0010)	(0.0014)
Observations	254,723	254,723	254,723	254,723	254,723
Pseudo R^2	0.304	0.284	0.255	0.228	0.206

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 10: Quantile regression coefficients for *non-covered* workers, *Model 2, 1995*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.0919	0.0787	0.0976	0.0924	0.0748
	(0.0127)	(0.0077)	(0.0063)	(0.0074)	(0.0186)
$(age/10)^2$	-0.0121	-0.0105	-0.0126	-0.0119	-0.0099
	(0.0141)	(0.0072)	(0.0074)	(0.0071)	(0.0110)
tenure/10	0.1661	0.1550	0.1287	0.1186	0.1166
	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)
$(tenure/10)^2$	-0.0341	-0.0300	-0.0227	-0.0203	-0.0193
	(0.0057)	(0.0042)	(0.0038)	(0.0033)	(0.0067)
years of schooling	0.0274	0.0261	0.0235	0.0227	0.0226
	(0.0007)	(0.0005)	(0.0004)	(0.0003)	(0.0008)
female	-0.2116	-0.2103	-0.2011	-0.1973	-0.1947
	(0.0022)	(0.0017)	(0.0012)	(0.0010)	(0.0025)
married	0.0294	0.0304	0.0291	0.0256	0.0265
	(0.0047)	(0.0028)	(0.0032)	(0.0023)	(0.0039)
unskilled worker (reference)					
semi-skilled worker	0.0998	0.0825	0.0918	0.0979	0.0986
	(0.0025)	(0.0022)	(0.0022)	(0.0019)	(0.0036)
skilled worker	0.1903	0.1697	0.1807	0.1973	0.2146
	(0.0044)	(0.0026)	(0.0029)	(0.0017)	(0.0041)
high-skilled worker	0.2886	0.2751	0.3252	0.3509	0.3626
	(0.0024)	(0.0024)	(0.0030)	(0.0029)	(0.0042)
time wage (preference)					
bonus wage	0.0804	0.0931	0.0987	0.0953	0.0860
	(0.0074)	(0.0049)	(0.0027)	(0.0028)	(0.0082)
piece wage	0.0840	0.0899	0.0964	0.1022	0.0847
	(0.0081)	(0.0046)	(0.0068)	(0.0035)	(0.0087)
bonus- and piece wage	0.0871	0.0857	0.1165	0.1094	0.0946
	(0.0019)	(0.0061)	(0.0058)	(0.0056)	(0.0074)
mixed wage	0.0454	0.0431	0.0428	0.0534	0.0708
	(0.0125)	(0.0169)	(0.0075)	(0.0036)	(0.0140)
firm in Hamburg or Schleswig-Holstein	-0.0113	0.0133	0.0309	0.0304	0.0470
	(0.0076)	(0.0038)	(0.0072)	(0.0047)	(0.0075)
firm in Lower Saxony or Bremen	-0.0817	-0.0750	-0.0685	-0.0562	-0.0217
	(0.0095)	(0.0066)	(0.0077)	(0.0058)	(0.0074)
firm in North Rhine-Westphalia	-0.0544	-0.0450	-0.0348	-0.0266	-0.0013
	(0.0044)	(0.0034)	(0.0040)	(0.0045)	(0.0074)
firm in Hesse	-0.0519	-0.0555	-0.0660	-0.0621	-0.0542
	(0.0035)	(0.0033)	(0.0032)	(0.0032)	(0.0056)
firm in Rhineland-Palatinate or Saarland	-0.0151	-0.0037	-0.0053	-0.0221	-0.0249
	(0.0059)	(0.0035)	(0.0036)	(0.0028)	(0.0056)
firm in Bavaria	-0.0845	-0.0862	-0.0918	-0.0911	-0.0706
	(0.0011)	(0.0043)	(0.0021)	(0.0013)	(0.0052)
firm in Baden-Württemberg (reference)					
Constant	1.6128	1.7587	1.8510	1.9751	2.1032
	(0.0049)	(0.0020)	(0.0039)	(0.0029)	(0.0044)
Observations	27,314	27,314	27,314	27,314	27,314
Pseudo R^2	0.358	0.359	0.341	0.315	0.288

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 11: Quantile regression coefficients for *covered* workers, *Model 2, 2001*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1106	0.0935	0.0847	0.0738	0.0857
	(0.0078)	(0.0039)	(0.0030)	(0.0048)	(0.0100)
$(age/10)^2$	-0.0138	-0.0117	-0.0109	-0.0098	-0.0108
	(0.0072)	(0.0045)	(0.0041)	(0.0053)	(0.0072)
tenure/10	0.1002	0.0920	0.0856	0.0789	0.0695
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
$(tenure/10)^2$	-0.0192	-0.0167	-0.0147	-0.0131	-0.0116
	(0.0026)	(0.0019)	(0.0017)	(0.0022)	(0.0030)
years of schooling	0.0203	0.0194	0.0205	0.0231	0.0244
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
female	-0.1802	-0.1524	-0.1167	-0.1154	-0.1165
	(0.0012)	(0.0008)	(0.0007)	(0.0008)	(0.0012)
married	0.0223	0.0211	0.0203	0.0208	0.0158
	(0.0035)	(0.0025)	(0.0020)	(0.0020)	(0.0029)
unskilled worker (reference)					
semi-skilled worker	0.0807	0.0745	0.0692	0.0723	0.0608
	(0.0017)	(0.0012)	(0.0011)	(0.0013)	(0.0020)
skilled worker	0.1429	0.1316	0.1290	0.1302	0.1444
	(0.0034)	(0.0021)	(0.0018)	(0.0020)	(0.0028)
high-skilled worker	0.2437	0.2379	0.2357	0.2377	0.2447
	(0.0020)	(0.0014)	(0.0012)	(0.0015)	(0.0022)
time wage (preference)					
bonus wage	0.0267	0.0597	0.0885	0.0825	0.0622
	(0.0018)	(0.0013)	(0.0012)	(0.0016)	(0.0024)
piece wage	0.0967	0.1249	0.1265	0.0990	0.0596
	(0.0033)	(0.0022)	(0.0016)	(0.0019)	(0.0025)
bonus- and piece wage	0.0615	0.1232	0.1490	0.1573	0.1320
	(0.0047)	(0.0031)	(0.0020)	(0.0021)	(0.0028)
mixed wage	0.0464	0.0359	0.0337	0.0189	-0.0068
	(0.0089)	(0.0048)	(0.0050)	(0.0069)	(0.0106)
firm in Hamburg or Schleswig-Holstein	-0.0703	-0.0507	-0.0415	-0.0250	0.0153
	(0.0033)	(0.0019)	(0.0021)	(0.0030)	(0.0037)
firm in Lower Saxony or Bremen	-0.0633	-0.0614	-0.0712	-0.0707	-0.0461
	(0.0036)	(0.0029)	(0.0029)	(0.0036)	(0.0051)
firm in North Rhine-Westphalia	-0.0640	-0.0529	-0.0495	-0.0440	-0.0300
	(0.0028)	(0.0017)	(0.0017)	(0.0021)	(0.0034)
firm in Hesse	-0.0281	-0.0356	-0.0542	-0.0679	-0.0605
	(0.0021)	(0.0015)	(0.0014)	(0.0018)	(0.0025)
firm in Rhineland-Palatinate or Saarland	-0.0751	-0.0682	-0.0801	-0.0901	-0.0879
	(0.0028)	(0.0019)	(0.0016)	(0.0021)	(0.0029)
firm in Bavaria	-0.0619	-0.0663	-0.0744	-0.0757	-0.0598
	(0.0027)	(0.0020)	(0.0016)	(0.0020)	(0.0029)
firm in Baden-Württemberg (reference)					
Constant	1.8955	2.0395	2.1573	2.2730	2.3469
	(0.0019)	(0.0016)	(0.0014)	(0.0017)	(0.0025)
Observations	126,941	126,941	126,941	126,941	126,941
Pseudo R^2	0.231	0.213	0.199	0.174	0.148

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 12: Quantile regression coefficients for *non-covered* workers, *Model 2, 2001*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1248	0.1230	0.1208	0.1290	0.1167
	(0.0102)	(0.0057)	(0.0050)	(0.0076)	(0.0145)
$(age/10)^2$	-0.0153	-0.0149	-0.0143	-0.0150	-0.0138
	(0.0099)	(0.0064)	(0.0068)	(0.0080)	(0.0095)
tenure/10	0.1074	0.1131	0.1177	0.1145	0.1233
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)
$(tenure/10)^2$	-0.0182	-0.0198	-0.0203	-0.0185	-0.0214
	(0.0039)	(0.0028)	(0.0033)	(0.0038)	(0.0047)
years of schooling	0.0181	0.0188	0.0223	0.0232	0.0199
	(0.0005)	(0.0003)	(0.0004)	(0.0005)	(0.0006)
female	-0.2091	-0.1976	-0.1955	-0.1836	-0.1790
	(0.0007)	(0.0011)	(0.0005)	(0.0013)	(0.0015)
married	0.0255	0.0222	0.0220	0.0153	0.0117
	(0.0033)	(0.0025)	(0.0025)	(0.0030)	(0.0040)
unskilled worker (reference)					
semi-skilled worker	0.1330	0.1180	0.1102	0.1104	0.1269
	(0.0024)	(0.0018)	(0.0019)	(0.0023)	(0.0029)
skilled worker	0.2446	0.2311	0.2161	0.2143	0.2397
	(0.0037)	(0.0023)	(0.0023)	(0.0028)	(0.0035)
high-skilled worker	0.3403	0.3223	0.3208	0.3483	0.4135
	(0.0026)	(0.0018)	(0.0021)	(0.0023)	(0.0031)
time wage (preference)					
bonus wage	0.0858	0.1045	0.1237	0.1383	0.1560
	(0.0030)	(0.0042)	(0.0040)	(0.0045)	(0.0071)
piece wage	0.0436	0.0771	0.1134	0.1409	0.1519
	(0.0052)	(0.0021)	(0.0041)	(0.0054)	(0.0075)
bonus- and piece wage	0.1656	0.1537	0.1532	0.1193	0.1599
	(0.0062)	(0.0056)	(0.0101)	(0.0063)	(0.0102)
mixed wage	0.0192	0.0274	0.0497	0.0773	0.1019
	(0.0307)	(0.0084)	(0.0160)	(0.0335)	(0.0368)
firm in Hamburg or Schleswig-Holstein	-0.1059	-0.0658	-0.0235	0.0085	0.0348
	(0.0031)	(0.0041)	(0.0051)	(0.0059)	(0.0071)
firm in Lower Saxony or Bremen	-0.1084	-0.0999	-0.0913	-0.0997	-0.1080
	(0.0039)	(0.0038)	(0.0045)	(0.0049)	(0.0059)
firm in North Rhine-Westphalia	-0.0289	-0.0383	-0.0430	-0.0394	-0.0354
	(0.0041)	(0.0026)	(0.0028)	(0.0034)	(0.0045)
firm in Hesse	-0.0191	-0.0197	-0.0154	-0.0156	-0.0078
	(0.0028)	(0.0022)	(0.0030)	(0.0030)	(0.0043)
firm in Rhineland-Palatinate or Saarland	-0.0850	-0.0751	-0.0719	-0.0831	-0.0908
	(0.0040)	(0.0031)	(0.0029)	(0.0039)	(0.0051)
firm in Bavaria	-0.1040	-0.0899	-0.0751	-0.0762	-0.0727
	(0.0028)	(0.0026)	(0.0020)	(0.0030)	(0.0041)
firm in Baden-Württemberg (reference)					
Constant	1.7110	1.8031	1.8680	1.9547	2.1091
	(0.0042)	(0.0026)	(0.0029)	(0.0028)	(0.0037)
Observations	52,770	52,770	52,770	52,770	52,770
Pseudo R^2	0.308	0.311	0.288	0.263	0.254

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 13: Quantile regression coefficients for *covered* workers, *Model 3, 1995*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.0593	0.0622	0.0579	0.0548	0.0599
	(0.0045)	(0.0028)	(0.0022)	(0.0036)	(0.0076)
$(age/10)^2$	-0.0076	-0.0080	-0.0075	-0.0071	-0.0075
	(0.0032)	(0.0027)	(0.0024)	(0.0030)	(0.0044)
tenure/10	0.0746	0.0656	0.0551	0.0463	0.0396
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)
$(tenure/10)^2$	-0.0139	-0.0116	-0.0089	-0.0067	-0.0047
	(0.0014)	(0.0012)	(0.0011)	(0.0014)	(0.0019)
years of schooling	0.0138	0.0136	0.0140	0.0140	0.0144
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
female	-0.0995	-0.0989	-0.0991	-0.1015	-0.1062
	(0.0007)	(0.0005)	(0.0005)	(0.0006)	(0.0008)
married	0.0262	0.0249	0.0230	0.0221	0.0227
	(0.0013)	(0.0011)	(0.0010)	(0.0012)	(0.0017)
unskilled worker (reference)					
semi-skilled worker	0.0639	0.0600	0.0530	0.0490	0.0453
	(0.0008)	(0.0007)	(0.0007)	(0.0008)	(0.0012)
skilled worker	0.1358	0.1321	0.1254	0.1226	0.1241
	(0.0012)	(0.0010)	(0.0009)	(0.0011)	(0.0015)
high skilled worker	0.2107	0.2093	0.2096	0.2174	0.2294
	(0.0010)	(0.0008)	(0.0007)	(0.0009)	(0.0013)
time wage (preference)					
bonus wage	0.0351	0.0352	0.0326	0.0343	0.0332
	(0.0010)	(0.0008)	(0.0009)	(0.0011)	(0.0016)
piece wage	0.0904	0.0988	0.0915	0.0797	0.0662
	(0.0014)	(0.0010)	(0.0010)	(0.0013)	(0.0018)
bonus- and piece wage	0.0359	0.0492	0.0549	0.0496	0.0343
	(0.0014)	(0.0010)	(0.0009)	(0.0010)	(0.0015)
mixed wage	0.0132	0.0199	0.0289	0.0309	0.0358
	(0.0063)	(0.0091)	(0.0048)	(0.0039)	(0.0039)
firm size with 100-199 employees (reference)					
firm size with 200-499 employees	0.0234	0.0224	0.0225	0.0263	0.0283
	(0.0018)	(0.0021)	(0.0017)	(0.0018=	(0.0026)
firm size with 500-999 employees	0.0424	0.0448	0.0477	0.0505	0.0532
	(0.0011)	(0.0010)	(0.0009)	(0.0012)	(0.0017)
firm size with 1000 or more employees	0.0802	0.0843	0.0862	0.0843	0.0833
	(0.0010)	(0.0009)	(0.0008)	(0.0009)	(0.0014)
share of …					
…female	-0.1698	-0.1807	-0.1945	-0.2033	-0.2015
	(0.0014)	(0.0011)	(0.0011)	(0.0016)	(0.0026)
…unskilled (reference)					
…skilled	-0.0067	-0.0061	-0.0031	0.0027	0.0132
	(0.0024)	(0.0019)	(0.0017)	(0.0022)	(0.0031)
…high-skilled	0.0059	0.0276	0.0864	0.1942	0.3101
	(0.0018)	(0.0016)	(0.0015)	(0.0019)	(0.0027)
…workers younger than 25 years	-0.2111	-0.1946	-0.1604	-0.1359	-0.1208
	(0.0125)	(0.0100)	(0.0097)	(0.0127)	(0.0201)
…workers between 25 an 30 years	-0.0256	-0.0308	-0.0579	-0.1113	-0.1762
	(0.0084)	(0.0071)	(0.0069)	(0.0087)	(0.0127)
…workers between 30 an 35 years	0.0322	0.0226	-0.0316	-0.0874	-0.1400
	(0.0069)	(0.0058)	(0.0055)	(0.0069)	(0.0099)
…workers between 35 an 40 years	-0.0851	-0.0837	-0.0745	-0.0974	-0.1120
	(0.0066)	(0.0056)	(0.0053)	(0.0065)	(0.0096)
…workers between 40 an 45 years	-0.0774	-0.0418	-0.0308	-0.0018	0.0012
	(0.0075)	(0.0063)	(0.0058)	(0.0073)	(0.0107)
…workers between 45 an 50 years	0.0122	0.0413	0.0522	0.0550	0.0653
	(0.0078)	(0.0064)	(0.0060)	(0.0074)	(0.0110)
…workers with more than 50 years (reference)					
firm in Hamburg or Schleswig-Holstein	-0.0466	-0.0468	-0.0371	-0.0227	-0.0105
	(0.0077)	(0.0064)	(0.0060)	(0.0075)	(0.0112)
firm in Lower Saxony or Bremen	-0.0565	-0.0616	-0.0586	-0.0555	-0.0452
	(0.0020)	(0.0015)	(0.0016)	(0.0019)	(0.0029)
firm in North Rhine-Westphalia	-0.0365	-0.0360	-0.0304	-0.0162	0.0079
	(0.0014)	(0.0012)	(0.0011)	(0.0014)	(0.0020)
firm in Hesse	-0.0537	-0.0608	-0.0619	-0.0655	-0.0638
	(0.0011)	(0.0008)	(0.0008)	(0.0011)	(0.0015)
firm in Rhineland-Palatinate or Saarland	-0.0334	-0.0334	-0.0375	-0.0458	-0.0562
	(0.0010)	(0.0011)	(0.0010)	(0.0012)	(0.0017)
firm in Bavaria	-0.0729	-0.0795	-0.0794	-0.0798	-0.0744
	(0.0014)	(0.0014)	(0.0010)	(0.0012)	(0.0017)
firm in Baden-Württemberg (reference)					
Constant	2.0878	2.1719	2.2808	2.3887	2.4645
	(0.0009)	(0.0007)	(0.0008)	(0.0008)	(0.0013)
Observations	254,723	254,723	254,723	254,723	254,723
Pseudo R^2	0.396	0.376	0.346	0.318	0.297

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 14: Quantile regression coefficients for *non-covered* workers, *Model 3, 1995*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.0413	0.0540	0.0623	0.0774	0.0604
	(0.0071)	(0.0055)	(0.0048)	(0.0070)	(0.0165)
$(age/10)^2$	-0.0061	-0.0076	-0.0085	-0.0100	-0.0075
	(0.0051)	(0.0051)	(0.0054)	(0.0066)	(0.0091)
tenure/10	0.1470	0.1333	0.1171	0.0980	0.0852
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
$(tenure/10)^2$	-0.0300	-0.0268	-0.0227	-0.0177	-0.0139
	(0.0023)	(0.0019)	(0.0034)	(0.0037)	(0.0047)
years of schooling	0.0114	0.0110	0.0119	0.0119	0.0140
	(0.0002)	(0.0001)	(0.0005)	(0.0004)	(0.0006)
female	-0.1608	-0.1539	-0.1573	-0.1558	-0.1609
	(0.0008)	(0.0012)	(0.0009)	(0.0012)	(0.0020)
married	0.0281	0.0238	0.0229	0.0210	0.0207
	(0.0017)	(0.0015)	(0.0019)	(0.0025)	(0.0042)
unskilled worker (reference)					
semi-skilled worker	0.0917	0.0854	0.0892	0.0946	0.0960
	(0.0020)	(0.0013)	(0.0016)	(0.0016)	(0.0024)
skilled worker	0.1686	0.1700	0.1683	0.1861	0.2016
	(0.0017)	(0.0018)	(0.0018)	(0.0021)	(0.0030)
high skilled worker	0.2707	0.2741	0.2845	0.3054	0.3365
	(0.0015)	(0.0017)	(0.0019)	(0.0019)	(0.0037)
time wage (preference)					
bonus wage	0.0732	0.0744	0.0687	0.0656	0.0562
	(0.0028)	(0.0025)	(0.0036)	(0.0030)	(0.0046)
piece wage	0.0716	0.0772	0.0886	0.0926	0.1017
	(0.0028)	(0.0025)	(0.0023)	(0.0049)	(0.0034)
bonus- and piece wage	0.0640	0.0858	0.1004	0.0804	0.0630
	(0.0018)	(0.0021)	(0.0020)	(0.0019)	(0.0051)
mixed wage	0.0462	0.0493	0.0448	0.0661	0.0784
	(0.0050)	(0.0025)	(0.0174)	(0.0086)	(0.0328)
firm size with 100-199 employees (reference)					
firm size with 200-499 employees	0.0300	0.0249	0.0189	0.0159	0.0189
	(0.0022)	(0.0040)	(0.0023)	(0.0066)	(0.0054)
firm size with 500-999 employees	0.0401	0.0630	0.0740	0.0919	0.1179
	(0.0014)	(0.0016)	(0.0018)	(0.0018)	(0.0030)
firm size with 1000 or more employees	0.1165	0.1202	0.1286	0.1354	0.1317
	(0.0059)	(0.0024)	(0.0020)	(0.0059)	(0.0053)
share of …					
…female	-0.1470	-0.1395	-0.1453	-0.1445	-0.1209
	(0.0029)	(0.0025)	(0.0051)	(0.0051)	(0.0121)
…unskilled (reference)					
…skilled	0.0435	0.0488	0.0407	0.0450	0.0591
	(0.0027)	(0.0029)	(0.0030)	(0.0038)	(0.0073)
…high-skilled	0.1414	0.1891	0.2181	0.2057	0.2218
	(0.0029)	(0.0028)	(0.0031)	(0.0028)	(0.0041)
…workers younger than 25 years	-0.4262	-0.4177	-0.3783	-0.3033	-0.3026
	(0.0106)	(0.0128)	(0.0139)	(0.0114)	(0.0351)
…workers between 25 an 30 years	0.0578	0.0163	-0.0238	-0.0060	-0.0558
	(0.0095)	(0.0130)	(0.0116)	(0.0151)	(0.0187)
…workers between 30 an 35 years	0.0546	-0.0066	-0.0835	-0.0767	-0.0884
	(0.0090)	(0.0096)	(0.0136)	(0.0138)	(0.0187)
…workers between 35 an 40 years	0.0387	0.0090	0.0102	-0.0169	-0.0040
	(0.0070)	(0.0096)	(0.0111)	(0.0123)	(0.0186)
…workers between 40 an 45 years	-0.0722	-0.0665	-0.0814	-0.1007	-0.1215
	(0.0103)	(0.0082)	(0.0133)	(0.0094)	(0.0124)
…workers between 45 an 50 years	-0.0287	0.0041	0.0126	0.0527	0.0670
	(0.0084)	(0.0098)	(0.0147)	(0.0091)	(0.0197)
…workers with more than 50 years (reference)					
firm in Hamburg or Schleswig-Holstein	-0.0149	-0.0122	0.0106	0.0106	0.0228
	(0.0082)	(0.0116)	(0.0122)	(0.0105)	(0.0201)
firm in Lower Saxony or Bremen	-0.0674	-0.0577	-0.0527	-0.0663	-0.0379
	(0.0014)	(0.0018)	(0.0030)	(0.0025)	(0.0055)
firm in North Rhine-Westphalia	-0.0470	-0.0426	-0.0333	-0.0364	-0.0244
	(0.0032)	(0.0020)	(0.0020)	(0.0022)	(0.0053)
firm in Hesse	-0.0392	-0.0476	-0.0614	-0.0815	-0.0795
	(0.0009)	(0.0015)	(0.0029)	(0.0040)	(0.0040)
firm in Rhineland-Palatinate or Saarland	-0.0040	0.0004	-0.0107	-0.0316	-0.0582
	(0.0009)	(0.0007)	(0.0031)	(0.0023)	(0.0044)
firm in Bavaria	-0.0717	-0.0783	-0.0724	-0.0807	-0.0755
	(0.0015)	(0.0019)	(0.0014)	(0.0017)	(0.0013)
firm in Baden-Württemberg (reference)					
Constant	1.9409	2.0228	2.1120	2.1886	2.2953
	(0.0013)	(0.0017)	(0.0017)	(0.0013)	(0.0032)
Observations	27314	27314	27314	27314	27314
Observations	27,314	27,314	27,314	27,314	27,314
Pseudo R^2	0.407	0.412	0.4	0.376	0.349

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 15: Quantile regression coefficients for *covered* workers, *Model 3, 2001*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1166	0.1009	0.0897	0.0931	0.0803
	(0.0062)	(0.0039)	(0.0030)	(0.0046)	(0.0100)
$(age/10)^2$	-0.0145	-0.0124	-0.0108	-0.0111	-0.0092
	(0.0059)	(0.0045)	(0.0037)	(0.0044)	(0.0067)
tenure/10	0.0879	0.0784	0.0587	0.0510	0.0404
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$(tenure/10)^2$	-0.0172	-0.0150	-0.0104	-0.0090	-0.0074
	(0.0019)	(0.0017)	(0.0015)	(0.0017)	(0.0028)
years of schooling	0.0159	0.0159	0.0152	0.0141	0.0130
	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0003)
female	-0.1011	-0.0948	-0.0886	-0.0867	-0.0893
	(0.0010)	(0.0008)	(0.0006)	(0.0005)	(0.0011)
married	0.0213	0.0212	0.0199	0.0165	0.0168
	(0.0025)	(0.0021)	(0.0018)	(0.0021)	(0.0031)
unskilled worker (reference)					
semi-skilled worker	0.0784	0.0649	0.0571	0.0513	0.0528
	(0.0011)	(0.0011)	(0.0010)	(0.0012)	(0.0017)
skilled worker	0.1529	0.1361	0.1254	0.1218	0.1367
	(0.0023)	(0.0018)	(0.0016)	(0.0018)	(0.0025)
high skilled worker	0.2236	0.2092	0.2050	0.2088	0.2363
	(0.0014)	(0.0012)	(0.0011)	(0.0013)	(0.0021)
time wage (preference)					
bonus wage	0.0413	0.0446	0.0387	0.0235	0.0036
	(0.0012)	(0.0012)	(0.0012)	(0.0015)	(0.0021)
piece wage	0.1005	0.0932	0.0718	0.0483	0.0362
	(0.0020)	(0.0016)	(0.0016)	(0.0015)	(0.0027)
bonus- and piece wage	0.0902	0.1006	0.1114	0.1153	0.1043
	(0.0025)	(0.0015)	(0.0015)	(0.0022)	(0.0031)
mixed wage	0.0317	0.0277	0.0289	0.0254	0.0204
	(0.0071)	(0.0026)	(0.0088)	(0.0044)	(0.0108)
firm size with 100-199 employees (reference)					
firm size with 200-499 employees	0.0405	0.0381	0.0384	0.0467	0.0560
	(0.0029)	(0.0024)	(0.0020)	(0.0023)	(0.0037)
firm size with 500-999 employees	0.0636	0.0646	0.0702	0.0791	0.0865
	(0.0016)	(0.0015)	(0.0013)	(0.0015)	(0.0026)
firm size with 1000 or more employees	0.1014	0.0988	0.1020	0.1178	0.1246
	(0.0017)	(0.0014)	(0.0015)	(0.0017)	(0.0025)
share of …					
…female	-0.1274	-0.1493	-0.1495	-0.1534	-0.1329
	(0.0019)	(0.0016)	(0.0014)	(0.0016)	(0.0029)
…unskilled (reference)					
…skilled	-0.0102	-0.0134	-0.0029	0.0205	0.0417
	(0.0026)	(0.0034)	(0.0033)	(0.0031)	(0.0053)
…high-skilled	0.1170	0.1402	0.1172	0.0644	0.0361
	(0.0023)	(0.0025)	(0.0020)	(0.0023)	(0.0038)
…workers younger than 25 years	-0.2228	-0.2549	-0.2606	-0.2887	-0.3513
	(0.0214)	(0.0106)	(0.0060)	(0.0135)	(0.0199)
…workers between 25 an 30 years	-0.0507	-0.0933	-0.1136	-0.1357	-0.1395
	(0.0113)	(0.0097)	(0.0094)	(0.0101)	(0.0158)
…workers between 30 an 35 years	-0.0512	-0.0675	-0.0878	-0.1192	-0.1474
	(0.0090)	(0.0088)	(0.0080)	(0.0098)	(0.0147)
…workers between 35 an 40 years	-0.0069	-0.0241	-0.0446	-0.0692	-0.0914
	(0.0075)	(0.0080)	(0.0072)	(0.0080)	(0.0126)
…workers between 40 an 45 years	-0.1203	-0.1418	-0.1532	-0.1936	-0.1967
	(0.0063)	(0.0072)	(0.0063)	(0.0073)	(0.0114)
…workers between 45 an 50 years	-0.1220	-0.1366	-0.1029	-0.1196	-0.1129
	(0.0060)	(0.0073)	(0.0070)	(0.0075)	(0.0118)
…workers with more than 50 years (reference)					
firm in Hamburg or Schleswig-Holstein	-0.0516	-0.0459	-0.0311	-0.0151	0.0168
	(0.0078)	(0.0083)	(0.0072)	(0.0076)	(0.0128)
firm in Lower Saxony or Bremen	-0.0635	-0.0603	-0.0588	-0.0502	-0.0476
	(0.0029)	(0.0023)	(0.0022)	(0.0029)	(0.0052)
firm in North Rhine-Westphalia	-0.0507	-0.0413	-0.0372	-0.0263	-0.0190
	(0.0019)	(0.0016)	(0.0015)	(0.0019)	(0.0026)
firm in Hesse	-0.0399	-0.0429	-0.0529	-0.0538	-0.0576
	(0.0015)	(0.0013)	(0.0013)	(0.0015)	(0.0022)
firm in Rhineland-Palatinate or Saarland	-0.0539	-0.0468	-0.0516	-0.0528	-0.0562
	(0.0010)	(0.0015)	(0.0016)	(0.0017)	(0.0025)
firm in Bavaria	-0.0560	-0.0557	-0.0548	-0.0518	-0.0483
	(0.0015)	(0.0014)	(0.0013)	(0.0014)	(0.0025)
firm in Baden-Württemberg (reference)					
Constant	2.0419	2.1986	2.3439	2.4694	2.6034
	(0.0013)	(0.0013)	(0.0013)	(0.0014)	(0.0021)
Observations	126,941	126,941	126,941	126,941	126,941
Pseudo R^2	0.321	0.307	0.291	0.267	0.243

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

Table 16: Quantile regression coefficients for *non-covered* workers, *Model 3, 2001*

log gross hourly wages	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
age/10	0.1235	0.1176	0.1153	0.1173	0.1201
	(0.0105)	(0.0055)	(0.0047)	(0.0071)	(0.0140)
$(age/10)^2$	-0.0151	-0.0141	-0.0133	-0.0135	-0.0136
	(0.0087)	(0.0065)	(0.0062)	(0.0059)	(0.0080)
tenure/10	0.0992	0.1036	0.0989	0.0914	0.0874
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
$(tenure/10)^2$	-0.0177	-0.0189	-0.0181	-0.0153	-0.0149
	(0.0032)	(0.0028)	(0.0027)	(0.0038)	(0.0046)
years of schooling	0.0061	0.0097	0.0128	0.0141	0.0142
	(0.0003)	(0.0004)	(0.0003)	(0.0005)	(0.0006)
female	-0.1606	-0.1532	-0.1584	-0.1522	-0.1578
	(0.0016)	(0.0010)	(0.0009)	(0.0014)	(0.0017)
married	0.0263	0.0193	0.0201	0.0156	0.0135
	(0.0036)	(0.0024)	(0.0026)	(0.0036)	(0.0045)
unskilled worker (reference)					
semi-skilled worker	0.1306	0.1142	0.1077	0.1071	0.1120
	(0.0022)	(0.0015)	(0.0017)	(0.0020)	(0.0026)
skilled worker	0.2407	0.2213	0.2091	0.2077	0.2164
	(0.0034)	(0.0019)	(0.0023)	(0.0027)	(0.0032)
high skilled worker	0.3279	0.3052	0.3101	0.3451	0.4038
	(0.0025)	(0.0017)	(0.0019)	(0.0022)	(0.0030)
time wage (preference)					
bonus wage	0.0695	0.0809	0.0899	0.0800	0.0819
	(0.0028)	(0.0034)	(0.0033)	(0.0047)	(0.0063)
piece wage	0.0325	0.0624	0.0754	0.0809	0.1004
	(0.0070)	(0.0042)	(0.0038)	(0.0046)	(0.0068)
bonus- and piece wage	0.0465	0.0825	0.1072	0.1015	0.0902
	(0.0056)	(0.0056)	(0.0047)	(0.0076)	(0.0130)
mixed wage	0.0080	0.0283	0.0447	0.0638	0.0865
	(0.0586)	(0.0040)	(0.0227)	(0.0317)	(0.0067)
firm size with 100-199 employees (reference)					
firm size with 200-499 employees	0.0631	0.0613	0.0627	0.0631	0.0643
	(0.0059)	(0.0027)	(0.0049)	(0.0048)	(0.0066)
firm size with 500-999 employees	0.0943	0.1001	0.1101	0.1177	0.1253
	(0.0040)	(0.0022)	(0.0024)	(0.0033)	(0.0036)
firm size with 1000 or more employees	0.1724	0.1822	0.1750	0.1712	0.1884
	(0.0065)	(0.0028)	(0.0054)	(0.0059)	(0.0066)
share of …					
…female	-0.1372	-0.1326	-0.1201	-0.1319	-0.1018
	(0.0033)	(0.0026)	(0.0026)	(0.0026)	(0.0036)
…unskilled (reference)					
…skilled	0.0313	0.0273	0.0262	0.0207	0.0135
	(0.0060)	(0.0035)	(0.0039)	(0.0045)	(0.0063)
…high-skilled	0.1450	0.1635	0.1788	0.1744	0.1391
	(0.0037)	(0.0025)	(0.0029)	(0.0032)	(0.0045)
…workers younger than 25 years	-0.1053	-0.1165	-0.1476	-0.1642	-0.2017
	(0.0280)	(0.0220)	(0.0066)	(0.0230)	(0.0261)
…workers between 25 an 30 years	-0.1119	-0.0907	-0.1199	-0.1403	-0.1560
	(0.0155)	(0.0118)	(0.0120)	(0.0132)	(0.0185)
…workers between 30 an 35 years	0.0273	0.0330	0.0220	-0.0215	-0.0225
	(0.0151)	(0.0107)	(0.0107)	(0.0131)	(0.0174)
…workers between 35 an 40 years	-0.0307	-0.0100	-0.0216	-0.0226	0.0054
	(0.0135)	(0.0092)	(0.0103)	(0.0107)	(0.0141)
…workers between 40 an 45 years	-0.0786	-0.0747	-0.0975	-0.1067	-0.0848
	(0.0114)	(0.0074)	(0.0096)	(0.0107)	(0.0134)
…workers between 45 an 50 years	-0.1059	-0.1005	-0.1133	-0.1142	-0.1182
	(0.0123)	(0.0091)	(0.0098)	(0.0107)	(0.0117)
…workers with more than 50 years (reference)					
firm in Hamburg or Schleswig-Holstein	-0.1054	-0.0812	-0.0577	-0.0518	-0.0314
	(0.0123)	(0.0098)	(0.0101)	(0.0120)	(0.0156)
firm in Lower Saxony or Bremen	-0.1048	-0.0990	-0.0912	-0.0904	-0.1024
	(0.0051)	(0.0039)	(0.0031)	(0.0033)	(0.0056)
firm in North Rhine-Westphalia	-0.0333	-0.0405	-0.0450	-0.0359	-0.0313
	(0.0032)	(0.0026)	(0.0028)	(0.0029)	(0.0042)
firm in Hesse	-0.0199	-0.0257	-0.0300	-0.0346	-0.0404
	(0.0031)	(0.0012)	(0.0022)	(0.0033)	(0.0031)
firm in Rhineland-Palatinate or Saarland	-0.0851	-0.0774	-0.0795	-0.0814	-0.0881
	(0.0030)	(0.0020)	(0.0027)	(0.0034)	(0.0040)
firm in Bavaria	-0.1013	-0.0868	-0.0763	-0.0737	-0.0750
	(0.0028)	(0.0020)	(0.0020)	(0.0027)	(0.0034)
firm in Baden-Württemberg (reference)					
Constant	1.9040	1.9794	2.0669	2.1659	2.2466
	(0.0025)	(0.0022)	(0.0026)	(0.0026)	(0.0035)
Observations	52,770	52,770	52,770	52,770	52,770
Pseudo R^2	0.352	0.358	0.342	0.323	0.307

analytic standard errors in parentheses, Source: GSES 1995; authors' calculations

C Figures

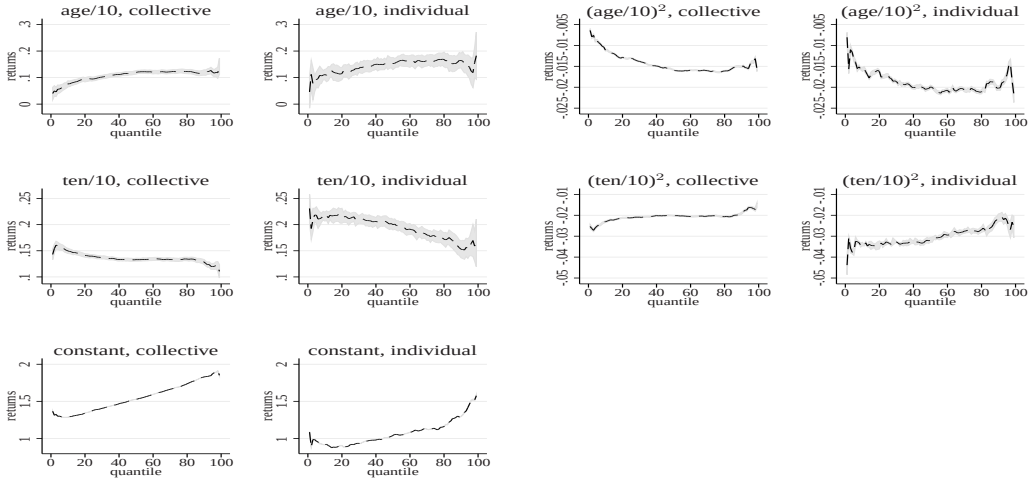

Figure 3: Quantile regression results: Comparison of the impact of human capital characteristics on wages between covered and non-covered workers, *Model 1*, *1995*. Source: GSES 1995; authors' calculations.

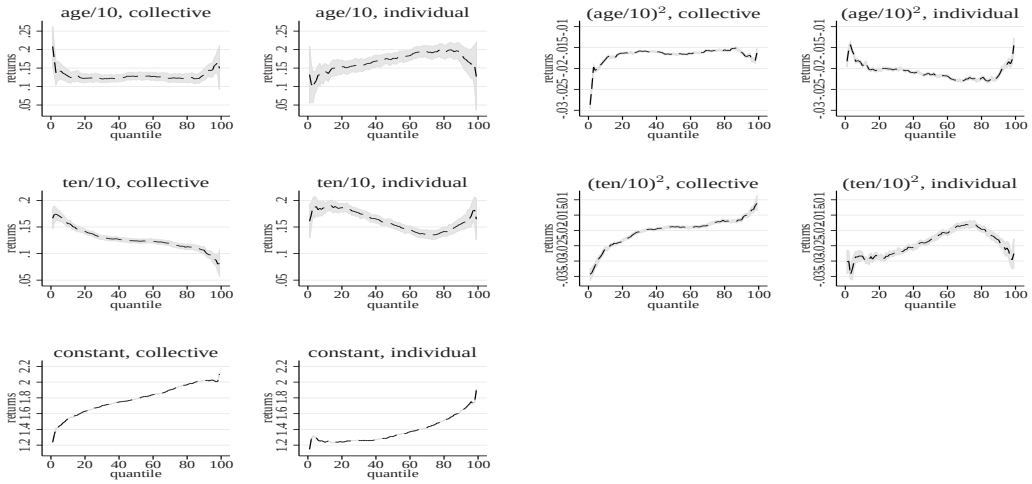

Figure 4: Quantile regression results: Comparison of the impact of human capital characteristics on wages between covered and non-covered workers, *Model 1*, *2001*. Source: GSES 2001; authors' calculations.

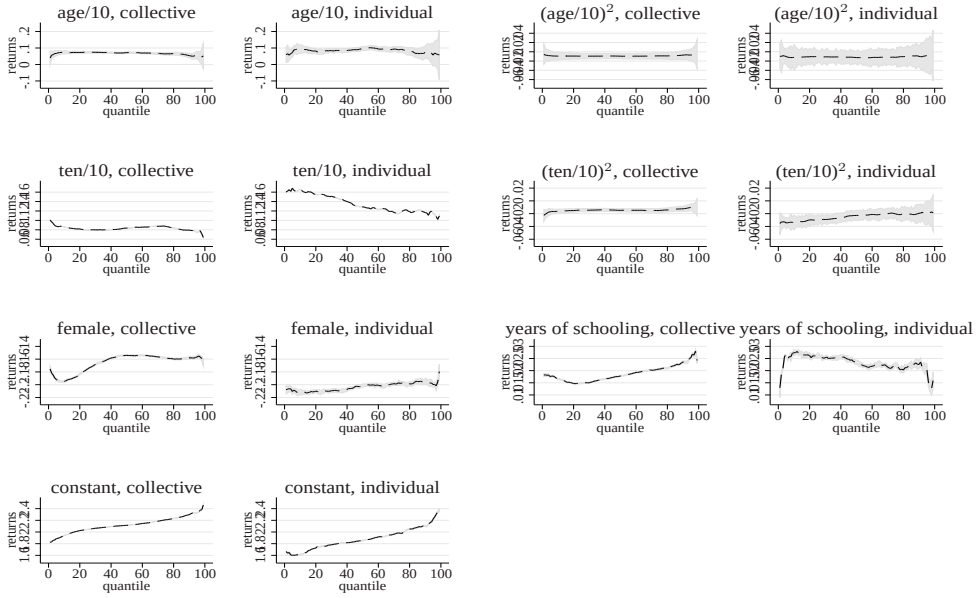

Figure 5: Quantile regression results: Comparison of the impact of human capital characteristics on wages between covered and non-covered workers, *Model 2*, *1995*. Source: GSES 1995; authors' calculations.

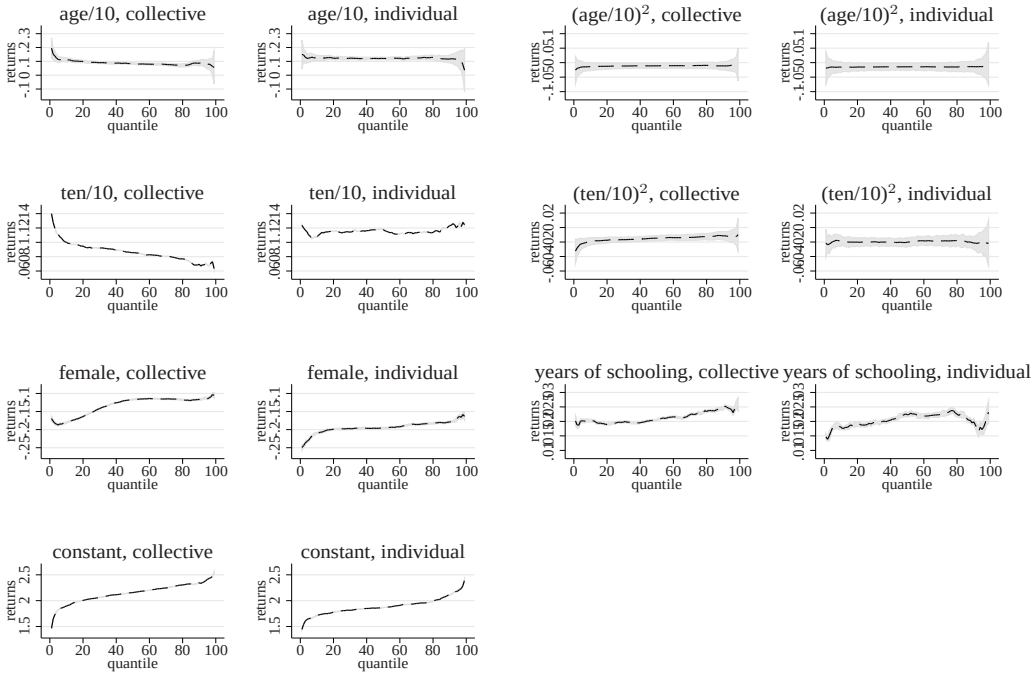

Figure 6: Quantile regression results: Comparison of the impact of human capital characteristics on wages between covered and non-covered workers, *Model 2*, *2001*. Source: GSES 2001; authors' calculations.

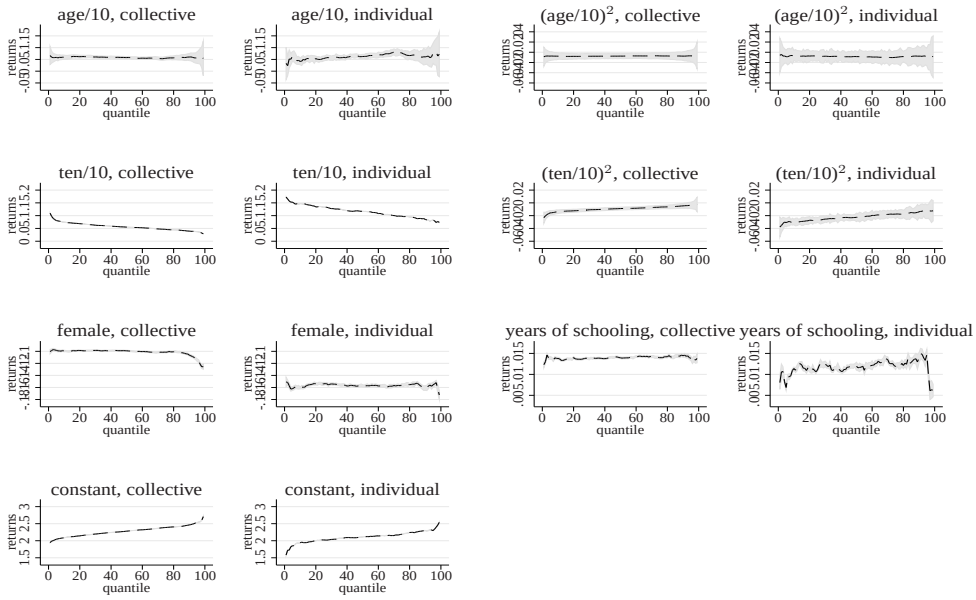

Figure 7: Quantile regression results: Comparison of the impact of human capital characteristics on wages between covered and non-covered workers, *Model 3*, *1995*. Source: GSES 1995; authors' calculations.

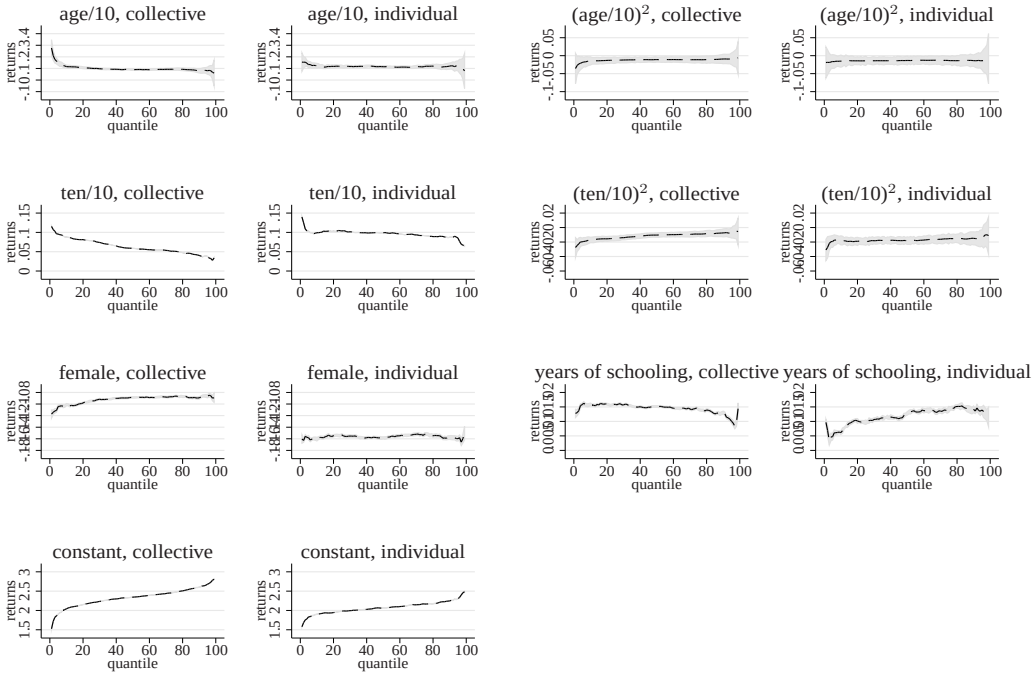

Figure 8: Quantile regression results: Comparison of the impact of human capital characteristics on wages between covered and non-covered workers, *Model 3*, *2001*. Source: GSES 2001; authors' calculations.

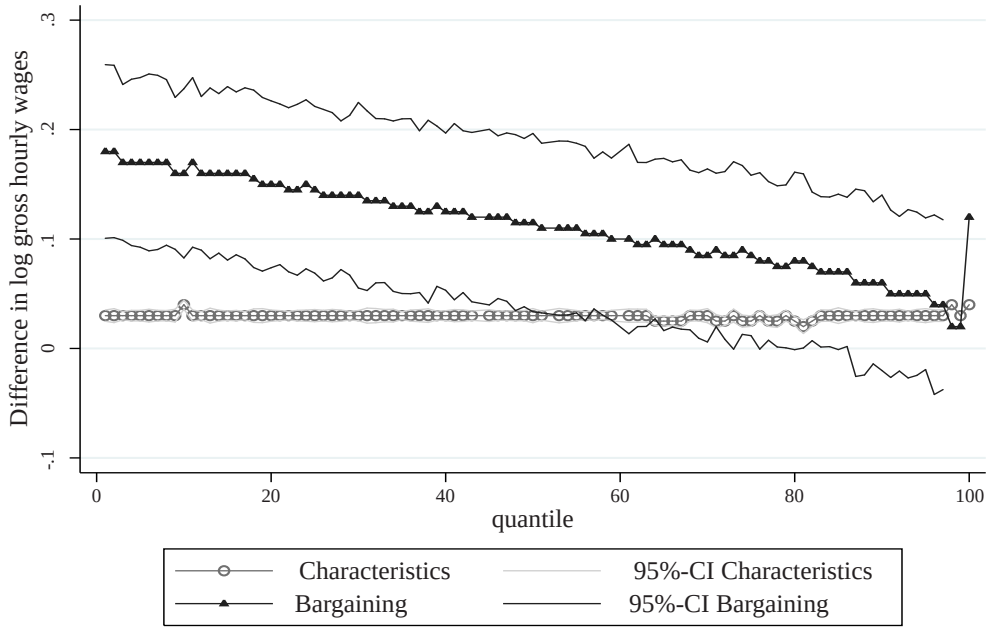

Figure 9: Decomposition of the wage differential between covered and non-covered workers, *Model 1, 1995*. Source: GSES 1995; authors' calculations. 95% confidence bands based on 1000 bootstrap resamples.

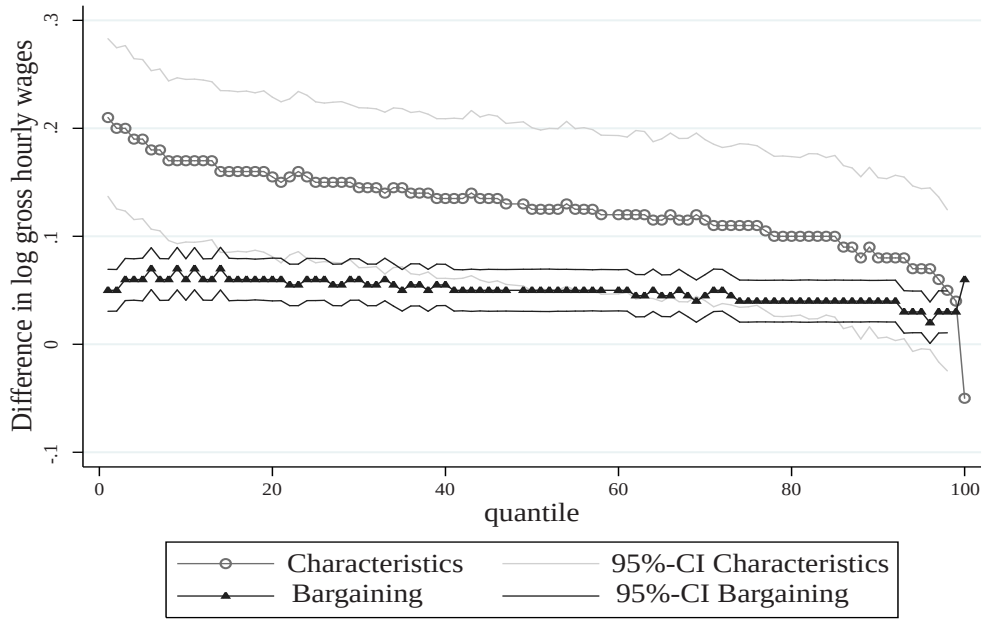

Figure 10: Decomposition of the wage differential between covered and non-covered workers, *Model 1, 2001*. Source: GSES 2001; authors' calculations. 95% confidence bands based on 1000 bootstrap resamples.

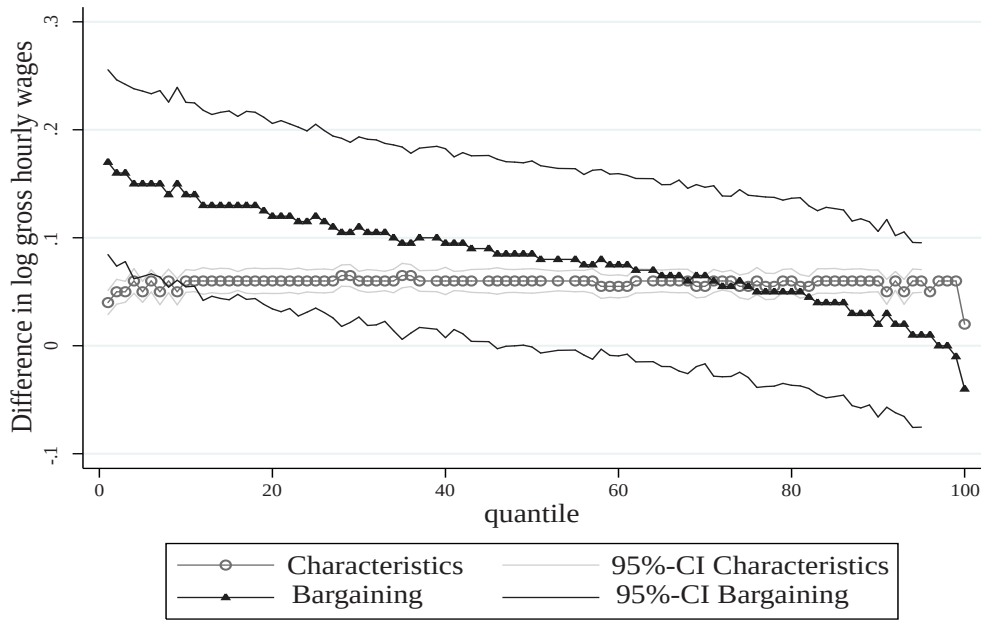

Figure 11: Decomposition of the wage differential between covered and non-covered workers, *Model 2, 1995*. Source: GSES 1995; authors' calculations. 95% confidence bands based on 1000 bootstrap resamples.

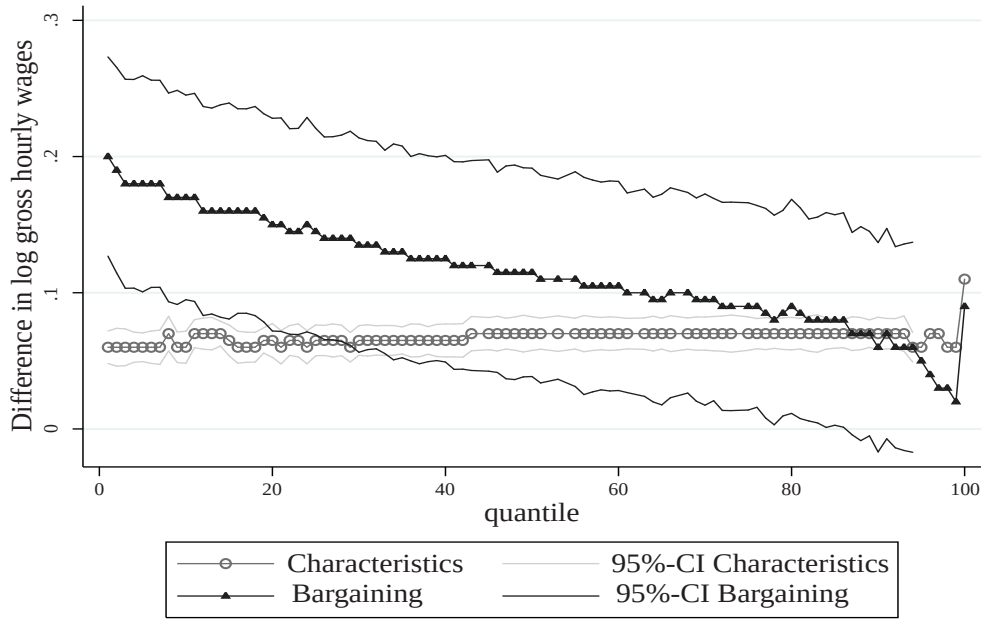

Figure 12: Decomposition of the wage differential between covered and non-covered workers, *Model 2, 2001*. Source: GSES 2001; authors' calculations. 95% confidence bands based on 1000 bootstrap resamples.

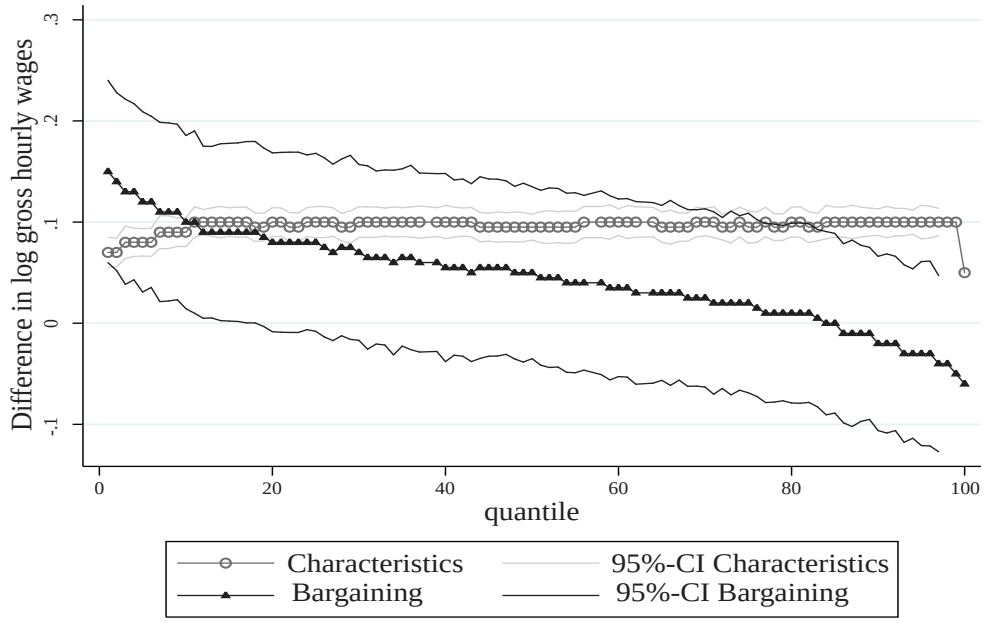

Figure 13: Decomposition of the wage differential between covered and non-covered workers, *Model 3, 1995*. Source: GSES 1995; authors' calculations. 95% confidence bands based on 1000 bootstrap resamples.

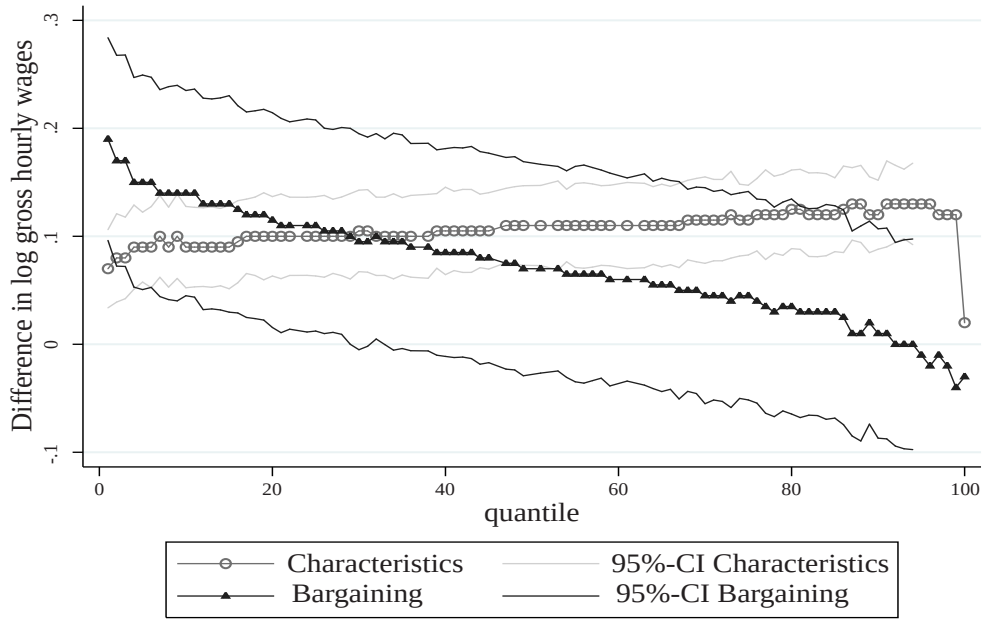

Figure 14: Decomposition of the wage differential between covered and non-covered workers, *Model 3, 2001*. Source: GSES 2001; authors' calculations. 95% confidence bands based on 1000 bootstrap resamples.

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