

Swedish Institute for Social Research (SOFI)

Stockholm University

WORKING PAPER 3/2006

**THE OUTCOME OF INDIVIDUAL WAGE BARGAINING AND THE
INFLUENCE OF MANAGERS' BARGAINING POWER:
EVIDENCE FROM UNION DATA**

by

Lena Granqvist and Håkan Regnér

The outcome of individual wage bargaining and the influence of managers' bargaining power: evidence from union data

Lena Granqvist
and
Håkan Regnér

Swedish Confederation of Professional Associations (SACO)
Box 2206, SE-103 15 Stockholm, Sweden
lena.granqvist@saco.se
hakan.regner@saco.se

ABSTRACT

We analyze unique data that identify whether individuals have participated in decentralized wage setting and whether they have negotiated their own wages. Wages are significantly higher for those who have been part of a formalized wage-setting process compared with non-participants, but only in the public sector. Employees who negotiate their own wages have higher wages than non-negotiators. Wages are also significantly higher for those who negotiate with a manager who has the power to set wages, compared with those who negotiate with a manager who has no power over wages. This concerns employees in the public and the private sectors. Quantile regression results reveal that the outcome of individual bargaining increases over the wage distribution. Percentile wage differences are significant only among workers who negotiate with a manager who has the power to set wages. Estimated wage differences between negotiators and non-negotiators are 4.6% on average, 5.6% in the 90th percentile, and 2.3% at the 10th percentile.

Keywords: wage bargaining, earnings equations, decentralized wage setting, quantile regression

JEL code: J31, J33, J41, J44

ACKNOWLEDGEMENTS

We thank seminar participants at the Office of Labour Market Policy Evaluation (IFAU); Trade Union Institute for Economic Research (FIEF); and the 2004 European Association of Labour Economists meeting for helpful comments.

1. Introduction

In most economies, wages are the outcome of negotiations between either unions and employer organizations at various levels, or between the individual and the employer at the local level. There are many studies of the effects of unions on wages and employment, as well as cross-country analyses of the macroeconomic effects of different wage-setting systems.¹ There is also a large body of literature on bargaining and contract theory, which provides important insights into the determinants of bargaining outcomes². In contrast, there are few empirical studies of the actual outcome of individual wage bargaining.³

In this study, we exploit unique union data on professionals to analyze the outcome of decentralized wage formation. These data identify whether individuals have negotiated their own wages, and if they have negotiated with a manager who has the power to set wages or with one who does not. This information allows us to investigate whether wages vary between employees within an organized local wage-setting system and non-participants, and between individuals who negotiate their own wages and those who do not. Moreover, we can measure the impact of managerial power on individual wages. An important aspect of the study is that it adds information to traditional wage equations, which are usually not observed in analyses of individual wages.

Empirical results indicate that wage inequality is greater in a decentralized than in a centralized wage-setting system (Katz & Autor, 1999). If this observation also applies when a strong egalitarian system becomes more individualistic, we would expect wages to vary between workers with varying influences over their own wages. This suggests that

¹ Booth (1995) and Addison & Schnabel (2002) include theoretical and empirical overviews of the trade union literature. See Katz & Autor (1999) for studies of the effects of wage-setting systems.

² Muthoo (1999) discusses the central aspects of bargaining theory. Salanié (1997) and Bolton & Dewatripont (2005) present the core ideas of contract theory.

³ There is one study of gender differences in individual wage bargaining (Säve-Söderbergh (2003).

the variables on individual bargaining exploited in this study may be used to examine the impact of decentralized bargaining on individual wages.

During the 1990s, the wage-setting system for professionals in Sweden changed from one where wages were set at industry level to one where wages were set at the firm level.⁴ Industry-level agreements structure the local wage-formation process, one important component of these agreements being the *pay review model*. In this model, employees meet their manager regularly and discuss individual performance, and eventually agree on a new wage. This model may be considered to be an institutionalized form of local wage bargaining.

The results of this study show that monthly wages are 2% higher for employees who participate in the pay review process, compared with non-participants. The wage differential is 1% in the private sector, 2% in the municipality sector and insignificant in the state sector. Quantile regression results show that the outcome of participation decreases over the wage distribution. Individuals who negotiate their own wages have significantly higher wages than non-negotiators. The wage effect of negotiations is significantly larger for those who negotiate with a manager who has the power to set wages. The monthly wage differential is 4.7% in the private sector, 4.3% in the municipality sector and 2.6% in the state sector. Quantile regression results reveal that the outcome of individual bargaining increases significantly over the wage distribution.

In this article, section 2 gives a brief institutional background. Section 3 sets the empirical framework for the data used for this study, which is given in section 4. Section 5 reports the empirical findings, followed by some concluding remarks in section 6.

⁴ Calmfors, Booth, Burda, Checchi, Naylor and Visser (2001) show that there has been an increasing tendency toward decentralized wage setting in many European countries during the 1990s.

2. Institutional background

Sweden has three confederations of unions. *Swedish Trade Union Confederation* (LO) is the central organization for 16 unions, organizing 1.9 million manual workers. *Swedish Confederation of Professional Employees* (TCO) has 18 affiliated unions and 1.3 million members, all of whom are qualified employees. *Swedish Confederation of Professional Associations* (SACO) is a confederation of 25 independent unions, with about 550,000 members, all of whom are academics or professionals with a college or university degree. In this study, we analyze individuals who are members of associations in SACO. This is because these unions were the first to adopt decentralized wage formation, and they have collected data that can be used to analyze the individual outcomes of local wage formation.

In the 1970s, SACO and the employer organizations signed non-binding central agreements on wages. These agreements set the framework for industry level wage bargaining. Since the 1980s, agreements are made at the industry level, between each employer organization and the unions that organize employees within that industry. In the public sector, unions have formed cartels that conduct the bargaining. In the private sector, each union negotiates with the employers within the industry.

In the late 1990s, unions and employers reached agreements at the industry level about the framework for wage bargaining at the local level. These agreements provided a set of rules for the local bargaining process and stated how the bargaining process should continue in cases when representatives at the local level could not reach an agreement.

The most recent industry-level agreements include only general guidelines about wage formation. Some unions have signed contracts, giving little room for individual bargaining, while others have agreed that all wages should be set through local wage bargaining. To get an overview of the formal structure of wage-setting systems, we classified all current agreements into four general classes. Table 1 presents the results, which show that wages for all employed members are set through some form of

local bargaining.⁵ The first class of agreements comprises nearly 60% of the employed members. They are covered by industry-level agreements, which stipulate that wages should be set at the local level and with no guaranteed wage changes. These agreements are common in the public and private sectors.

<TABLE 1 About here>

The second class of industry-level agreements states the size of the wage margin, and it applies if the union and the employer cannot reach an agreement at the local level. At the local level, the union and the employer bargain about the size of the wage margin and the distribution of the margin. There are no individual guarantees, which means that low-performing individuals covered by these agreements are at risk of getting no wage increase. These agreements cover about 21% of the employed members.

The third group of agreements covers 3% of the members, and includes information about the size of the margin and guarantees for individual wage increases. But unions and employers at the local level are allowed to bargain over the margin. Unions must accept the industry-level agreement only when they fail to reach a local agreement.

The last group of agreements covers 18% of the employed members, and includes information about the level of the wage margin. In this case, local unions and employers negotiate about the distribution of the wage margin.

Even if the industry-level agreements do not state wage margins, they all include statements about the role of wages and the factors that should affect individual wages. These statements show that unions and employers tend to argue in terms of efficiency wage theories. For example, most

⁵ The National Mediation Office indicates that wages for most Swedish workers are completely or partly set at the local level (Medlingsinstitutet 2002).

agreements state that wages should be used to create work incentives and that there should be a relationship between wages and performance.

Some industry-level agreements also organize the local wage-bargaining process, through a structure called the *pay review model*. This model implies that the individual and the manager meet regularly to discuss individual performance and eventually agree on a new wage. As per the agreements, employers must speak with employees before they set the wages. That is, the pay review model implies that the worker and the employer are involved in an organized form of local wage bargaining.⁶ If the local union and the employer agree *not* to use the pay review model, wages are set in traditional local bargaining processes between the union representative and the employer.

The pay review model was developed to structure the local wage bargaining process, and the union and the employer support the model's concepts. The model can be considered to be an institutionalized form of decentralized wage formation. Local union representatives know when the pay review talks are being held, which gives them opportunities to prepare employees for wage talks. Unions might also inform employees about bargaining strategies. The model has been formally used for the first time during the agreements covered by our data.

3. Empirical considerations

As a starting point, we analyze the relationship between the review process and log monthly wages. Consider this wage equation:

$$Y_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 X_{it} + \varepsilon_{lit}, \quad 1$$

⁶ It is possible that managers may have determined the wage level before the review talks, and only report the new wage when they meet the employee. Even so, they still have to motivate the wage, which means that they have evaluated the worker's relative performance.

where Y_{it} is the log of monthly wages for individual i at time t ; D_{it} is a dummy variable that indicates if the individual has participated in the review process; X_{it} is a vector of individual characteristics; and ε_{it} is a random error. The coefficient on D_{it} , β_1 represents the impact of participating in the review process in time t . This is the parameter of interest in the first analysis.

The pay review variable is a new variable in individual wage equations, and it captures aspects of individual wage formation, which were not observed in previous studies. Another interesting aspect of this variable is that it can be interpreted in terms of efficiency wage theories. For example, the employer might talk with only the most productive workers and give them higher wages than others, because she wants them to stay in the firm. The employer might also give employees who are part of the review process higher wages, to increase their loyalty to the firm and their performance. This implies that we should expect more productive workers to participate in the review talks, i.e. $\beta_1 > 0$. If employers talk with only the least productive workers, $\beta_1 < 0$.

We then estimate the outcome of individual bargaining, which is expected to depend on the manager's power over wage decisions. The wage equation is

$$Y_{it} = \beta_0 + \beta_2 D_{i2} + \beta_3 D_{i3} + \beta_4 X_{it} + \varepsilon_{2it} \quad 2$$

where D_{i2} is 1 if employees have negotiated with a manager who does not have the power to set wages, D_{i3} is 1 if employees have negotiated with a manager who has the power to set wages, and they are 0 if employees have not negotiated their own wages. The coefficients β_2 and β_3 represent the impact of individual wage bargaining and are the parameters of interest.

Various factors affect the outcome of bargaining. Bargaining theory suggests two general classes of factors: inside options (which in our case might be career possibilities and individual performance) and outside

options (e.g., job offers). Employers' inside options might be the firm's financial situation, other internal job candidates etc., while their outside options might be the likelihood of finding equally good external job candidates. These expectations lead to a final wage, which is the wage that the individual worker accepts and the outcome that we observe. The outcome of the bargaining process varies among employees, since employees at various positions have different inside and outside options. These differences are likely to affect employers' decisions about the distribution of wages.

The grouping of employees into negotiators and non-negotiators is affected by observed and unobserved characteristics. It can be assumed that negotiators, on average, share similar unobserved characteristics, i.e., differences in unobserved individual productivity must be smaller between groups of negotiators than between the groups of negotiators and non-negotiators. So comparing negotiators alone does not suffer from the same degree of selection bias as comparing negotiators with non-negotiators. Consequently, our estimates of the outcomes of individual bargaining with managers, who have different powers over wage setting, are not due to unobserved individual differences between negotiators. Rather, the estimated outcomes are due to differences between managers; these differences are either observed by their power over wage setting, or unobserved.

If individuals who negotiate are considered to be more productive than those who do not negotiate, negotiators will have higher wages than non-negotiators, $\beta_2 > 0$ and $\beta_3 > 0$. If employers only bargain with those who are at risk of receiving wage cuts or being laid off, $\beta_2 < 0$ and $\beta_3 < 0$. The sign might also be negative if non-negotiators are represented by a professional negotiator from the union, or if those who negotiate themselves are poor negotiators.

The size of the coefficients might vary. Managers with no power to set wages must discuss wages with other managers. The situation can be

compared with one in which a union negotiates for a group of workers, and in such a situation more/less productive workers tend to receive wages below/above their productivity⁷. This suggests that $\beta_2 > \beta_3$.

Employers' views on wage dispersion are also key for the outcome of individual bargaining. Levine (1991) argues that a compressed wage structure promotes cohesiveness, which makes firms willing to pay high wages even for less productive workers. Akerlof & Yellen (1991) argue that a compressed wage structure creates a positive working environment and improves productivity. This suggests that bargaining solutions might be independent of managers' power over wages. But Lazear (1995) argues that an increase of the wage dispersion has beneficial effects on individual productivity. If only managers who are allowed to set wages believe in the productivity effect, then the bargaining outcome will depend on the managers' power over wages.

In the third analysis, we use quantile regression⁸ to examine heterogeneity in the outcome of the pay review process and individual bargaining. We estimate the θ^{th} percentile of log monthly wages (y_i) conditional on individual characteristics (x_i) and our indicators of decentralized wage formation (D_{i1} , D_{i2} and D_{i3}). It is assumed that q_θ , which is the value of y_i conditional on x_i , D_{i1} , D_{i2} and D_{i3} in percentile θ is linear in the right-hand-side variables. We estimate this equation:

$$q_\theta(y_i) = \beta_{0\theta} + X_i\beta_{1\theta} + D\beta_{2\theta} + \varepsilon_{\theta i} \quad (3)$$

where D represents all indicators of decentralized wage formation. The estimated coefficients are interpreted as the impact in percentile θ of the wage distribution. This method is robust to outliers on the dependent variable. It assumes that the standard errors are homoskedastic. In our

⁷ Empirical results indicate that earnings inequality is lower in centralized wage-setting systems than in decentralized wage-setting systems (Blau & Kahn 1996).

⁸ See, e.g., Koenker & Basett (1974) and Buchinsky (1994).

application, this assumption is not fulfilled, and we estimate bootstrapped standard errors to adjust for the problem. We estimate the full covariance matrix of the estimators, including between-percentile blocks, which allows us to perform cross-percentile tests. In particular, we investigate whether the results are the same in p10 compared with p50, and p50 compared with p90.

4. Data

The data come from the Swedish Confederation of Professional Associations (SACO), and were collected through annual surveys of members. Each association within SACO conducts the survey, but the data are compiled by administrators at SACO. Unions use the data, e.g. to analyze wages and provide members with accurate information about wage levels among professionals.

The data were collected in 2002, which was the first year that a large sample of members was surveyed about decentralized wage formation. Seventeen out of 26 unions conducted a survey in 2002, and these unions represent about 50% of all employed members (but these unions represent 75% of the members in the private sector)⁹. We extracted two samples containing 97,810 and 11,448 individuals. The large sample (SAMPLE 1) includes individuals who answered questions about the pay review process, and the small sample (SAMPLE 2) includes individuals who also answered questions about managers' power over wage setting. The samples are analyzed separately.

Table 2a reports basic information about the sample used to analyze the outcome of the pay review process. Column one presents mean values for the complete sample, while columns two and three present mean sample characteristics of individuals who have participated in pay review talks (pay review=1), and individuals who have not participated in review talks (pay

⁹ About 140,000 individuals answered the questionnaire, which is a 70% response rate.

review=0), respectively. The table also includes results of tests of equal means and proportions in the samples of participants and non-participants.

< TABLE 2a About here >

The average monthly wage¹⁰ is SEK 32,400 (about EUR 3,377, exchange rate SEK 9.6/EUR 1). Due to the survey sampling design, most of the individuals included in the analyses work in the private sector (60%), while only 17% work in the municipality sector. About 60% have participated in a pay review process.

A college degree is required for union membership, which means that the union variable correlates strongly with formal education and profession. Notably, there are many engineers. Other large groups are individuals in *Jusek*, the Association of Graduates in Law, Business Administration and Economics, Computer and Systems Science, Personnel Management and Social Science (27.7%), and *Civek*, the Association of Graduates in Business Administration and Economics (10.9%).

Significant differences exist between participants in the pay review process and non-participants. Participants have fewer years of experience, work largely in the private sector, and have an educational background in engineering. There are also significantly more men among participants. The empirical analyses control for these differences, and we run separate regressions for each sector.

Table 2b reports mean sample characteristics of the bargaining sample. Column one presents the overall means, while the other columns report means for non-bargainers, individuals who have bargained with a manager who has no power to set wages, and individuals who have bargained with managers who has power over wages.

¹⁰ Full-time equivalents, including 1/12 of the calculated value of bonuses, provisions and fringe benefits.

< TABLE 2b About here >

Most of the individuals work in the public sector (60% in the municipal sector and 22% in the state sector). The reason is that only four unions have asked questions about manager' powers over wages, and these unions organize many workers in the public sector. The public sector is also the primary employer of women, which explains the large share of women in sample 2. Almost 31% of the sample population has negotiated their own wage. About 22% has bargained with a manager who has the power to set wages, and 8% with a manager who is not allowed to set wages.¹¹

There are significantly greater numbers of employees from the private and municipality sectors among negotiators than non-negotiators. There are also significant occupational differences between the groups. The empirical analyses control for these differences, and we run sector-specific regressions also for this sample.

5. Empirical findings

The pay review process

Employees in the private sector have longer experience of local wage setting than employees in the public sector. The experience might also vary among employers in the two sectors. Moreover, the content of the industry-level agreements, which provide the framework for the local bargaining process, can vary between sectors. These differences further motivate separate analyses of employees in the private and public sectors.

Table 3 reports estimated wage differences between college-educated employees in the private sector who have discussed wages with their manager, and employees who have not discussed wages. Column one reports the standard ordinary least squares (OLS) estimates, and columns P10-P90 report the percentile regression estimates.

¹¹ Among negotiators, 73% have negotiated with a manager who has the power to set wages and 27% with one who has no power over wages.

<TABLE 3 About here >

The estimates of the pay review variable suggest that wage levels vary among employees who have discussed wages with a manager and those who have not discussed wages. As per the OLS estimate, the wage difference is about 1%, which is based on the average wages for sample 1, and amounts to about EUR 410 per year. Percentile estimates below the 50th percentile are higher than the OLS estimate, while estimates above the 50th percentile are lower. The effect of participation in the pay review process decreases over the wage distribution and becomes negative at the top. This suggests that employees at low-paid positions benefit from the wage talks, while employees at higher-paid positions do not benefit.¹² Obviously, the pay review variable captures aspects of local wage formation, which are important for individual wages.

On average, there are no significant wage differences between participants in the pay review process and non-participants, in the state sector. But the percentile regression estimates show that there are significant wage differences between participants and non-participants up to the 60th percentile. At most, there is a monthly wage differential of 2.6%. As in the private sector, the estimated wage differences decrease over the wage distribution. There are no significant effects of participation in the pay review process at the top of the wage distribution.¹³

The wage difference between participants in the pay review process and non-participants is greatest in the municipality sector. The OLS estimates show that the wage differences are 2.1%, compared with 1% in the private sector. This is due to the significant wage differences in the top part

¹² Cross-percentile tests reject the hypothesis of equal coefficients in p10 versus p50 and in p50 versus p90 (F-values are 40.21 and 46.64).

¹³ The cross-percentile test does not reject the hypothesis of equal coefficients in p10 versus p50 (F-value is 1.62), but it rejects the hypothesis of equal coefficients in p50 versus p90 (F-value is 25.98).

of the distribution. In the lower part of the distribution, the results are similar in the private and municipality sectors but higher in the state sector. Moreover, the estimated wage differences do not fall much over the wage distribution in the municipality sector.¹⁴

There is a gender wage gap in all sectors, but it is larger in the private sector. In the private and municipality sectors, the gender wage gap increases significantly over the wage distribution, which suggests that there might be a glass ceiling for professional women. The returns to experience is lowest in the municipality sector and highest in the private sector, while the impact of the pay review variable is higher in the municipality sector than in the private sector. This might suggest that traditional factors, such as experience, are less important than other individual characteristics, which can be rewarded when wages are set at the local level.

Individual bargaining

Table 4 reports the estimated outcomes of individual bargaining and the returns to the basic individual characteristics for employees in the private and public sectors. There are two bargaining estimates, one for individuals who have negotiated with a manager who is not allowed to set wages, and another for individuals who have negotiated with a manager who has the power to set wages. The comparison group has either had a union representative negotiating for them or belongs to a group of employees who have not been given the option to bargain over their wages. Both bargainers and non-bargainers are union members.

< TABLE 4 About here >

Significant wage differences exist between employees who negotiate their own wages with a manager who has the power to set wages and non-

¹⁴ Cross-percentile tests do not reject the hypothesis of equal coefficients in p10 versus p50 and in p50 versus p90 (F-values are 3.07 and 0.61).

negotiators in the private sector. The wage differential is 4.7%, which amounts to EUR 111 per month based on the average wages for sample 2.

50

The wage differences vary somewhat over the distribution.¹⁵ The OLS estimate of the effects of bargaining with a manager who is not allowed to set wages is not significantly different from zero. The effects vary over the wage distribution, and there are significant differences between p20-p60. At most, the wage difference is 3.8%.

Wages vary significantly between employees who negotiate with a manager who is allowed to set wages and non-negotiators in the state sector. The level of the estimate is lower than the estimate in the private sector, while there is no major variation over the wage distribution in the state sector. The cross-percentile tests do not reject the hypothesis of equal coefficients.

There are significant differences between negotiators and non-negotiators in the municipality sector. The OLS estimate is about 1% for employees who negotiate with a manager who lacks the power over wages, and 4% for those who negotiate with a manager who has the power to set wages. The wage distribution varies considerably among individuals who negotiated with a manager who has the power to set wages –1.7% in p20 and as much as 7.3% in p90. The estimates also increase over the distribution for those who negotiated with a manager who lacks power over wages, 0.7% in p30 and 2.2% in p90.¹⁶ One explanation for this pattern might be that employees in the top part of the distribution are more able negotiators. They might, for example, have positions in which they regularly negotiate on various organizational matters. They might also be more experienced in general. In all, the variables capture either the impact of individual bargaining or differences in worker characteristics. Even so, the results clearly show that the variables capture aspects of local wage

¹⁵ The cross-percentile tests do not reject the hypothesis of equal coefficients.

¹⁶ Cross-percentile tests reject the hypothesis of equal coefficients in p10 versus p50 and in p50 versus p90 (F-values are 15.14 and 44.21).

formation that affect individual wages, and these factors are usually not observed in studies of individual wages.

6. Concluding remarks

The results in this study show that wages for participants in the pay review process are significantly higher than wages for non-participants. If employers act according to efficiency wage theories, they discuss wages only with the most productive employees. This might, in turn, suggest that productive workers benefit more than less productive workers from a system of decentralized wage setting.

The percentile regression results indicate that the wage differences among participants and non-participants in the pay review process are larger at the bottom of the wage distribution than at the top. This suggests that employees who has low wages benefit more from the pay review process than employees who has high wages. This might indicate that Swedish employers focus on low wage workers also within a decentralized wage setting system. But the results also show that the variable captures important aspects of individual wages that are usually not observed. If the variables correlate with individual unobservables, the results suggest that within a system of decentralized wage formation, non-traditional individual characteristics are important determinants of individual wages.

The results also show that individuals who negotiate their own wages have significantly higher wages than those who do not negotiate. The wage differences are greater for those who negotiate with a manager who has the power to set wages. The quantile regression results demonstrate that wage differences due to bargaining increase over the wage distribution. This might suggest that employees at the top of the wage distribution benefit the most from individual wage bargaining.

References

- Addison, J. & Schnabel, C. 2002. International handbook of trade unions. Edward Elgar, Cheltenham, UK; Northampton, MA, USA.
- Akerlof, G.A. & Yellen, J.L. 1990. "The fair-wage hypothesis and unemployment", *Quarterly Journal of Economics*, 105: 255-283.
- Blau, F.D. & Kahn, L.M. 1996. International differences in male wage inequality: institutions versus market forces, *Journal of Political Economy*, 104.
- Bolton, P., & Dewatripont, M. 2005. Contract theory. MIT Press, Cambridge, Mass & London, England.
- Booth, A. 1995. *The economics of trade unions*. Cambridge: Cambridge University Press.
- Buchinsky, M. 1994. Changes in the U.S. wage structure 1963-1987: application of quantile regression, *Econometrica*, 62(2): 405-458.
- Calmfors, C., Booth, A., Burda, M., Checchi, D., Naylor R., & Visser, J., (2001). The future of collective bargaining in Europe, in Boeri, T., A. Brugiavini and L. Calmfors (eds.) *The Role of Unions in the Twenty-First Century*. Oxford University Press.
- Katz, L-F. & Autor, D.H. 1999 Changes in the wage structure and earnings inequality, in O. Aschenfelter and D. Card (eds.), *Handbook of Labor Economics*, Vol. 3, Amsterdam: North Holland.
- Koenker, R. & Basett, G.Jr. 1974 Regression Quantiles, *Econometrica*, 46(2): 33-50.
- Lazear, E. P. 1995, *Personnel Economics*. The MIT Press, Cambridge, Massachusetts.
- Levine, D. 1991. "Cohesiveness, productivity and wage dispersion", *Journal of Economic Behaviour and Organization* 15: 237-255.
- Medlingsinstitutets årsrapport 2002. Avtalsrörelsen and lönebildningen 2002 (*Agreements and wage formation in 2002*). Medlingsinstitutet (National Mediation Office), Stockholm, www.mi.se.
- Muthoo, A. 1999. *Bargaining theory with applications*. Cambridge University Press, Cambridge.
- Salanie, B. 1997. *The economics of contracts*. MIT Press, Cambridge, Mass & London, England.
- Säve-Söderbergh, J. 2003. Are Women Asking for Low Wages? Individual Wage Bargaining and Gender Wage Differentials, in Säve-Söderbergh, J. *Essays on Gender Differences in Economic Decision-Making*, Dissertation Series 59, Swedish Institute for Social Research, Stockholm University.

Table 1 Agreement models among the unions within SACO and the number and percentage of members covered by each model, 2002.

AGREEMENT MODEL	Number of members	%
1. Local wage formation without nationally determined wage margin	208,000	57
2. Local wage formation with a cut-off regulating the size of the margin. No guarantees of individual wage margins.	78,000	21
3. Local wage formation with a cut-off regulating the size of the margin. Guarantees of individual wage margins.	11,000	3
4. Local wage formation. Bargaining about the distribution of wage margin decided at the industry level.	67,000	18
TOTAL	364,000	100

NOTE: Students, self employed, members of more than one union and members in firms, who have not signed collective agreements, are not included.

Table 2a Mean sample characteristics, pay review.

VARIABLES	SAMPLE 1	PAY	PAY
		REVIEW=1	REVIEW=0
monthly wages	32 416 (14100)	33 200 (13738)	310257 (14540)
years of experience	13.9 (10.4)	13.7 (10.2)	14.3 (10.6)*
% women	43.7	40.8	48.1**
% private sector	59.6	66.1	50.1**
% state sector	23.3	18.7	30.3**
% municipality sector	17.0	15.2	19.7**
% managers	21.5	22.0	20.7**
Distribution of individuals by unions, %			
Business Administration and economics, Civek	10.9	10.4	11.7**
Graduate engineers, CF	41.6	46.4	34.5**
Law, Computer and Systems Science, Jusek	27.7	27.9	27.5**
Teachers, LR	0.4	0.4	0.4
Social science, personnel, public administration, SSR	1.9	2.0	1.8**
Physiotherapists, LSR	5.6	4.4	7.3**
Occupational Therapists, FSA	3.3	2.7	4.3**
Documentation, Information and Culture, DIK	4.7	3.2	6.9**
Scientists, NATVET	3.8	2.6	5.6**
Numbers of individuals	97 810	58 340	39 470

NOTE: Standard deviations are in parentheses. Experience is number of years since college graduation. * equality of means is rejected at the 5% level. ** equality of proportions is rejected at the 5% level.

Table 2b Mean sample characteristics, bargaining.

VARIABLES	SAMPLE II	No bargaining	Manager has no power to set wages	Manager has power to set wages
monthly wages	22 788 (5 608)	22 678 (5 388)	21 796 (4 540)	23 507 (6 489)
years of experience	14.7 (10.3)	15.4 (10.3)*	11.3 (9.8)	13.8 (10.4)
% women	77.7	77.8	78.2	77.5
% private sector	17.6	13.2**	16.5	31.4
% state sector	22.0	27.1**	17.0	8.2
% municipality sector	60.4	59.7**	66.5	60.4
% managers	12.4	10.8	5.2	12.8
Distribution of individuals by unions, %				
Physiotherapists, LSR	34.2	25.9**	38.2	58.1
Occupational Therapists, FSA	19.8	22.1**	23.5	11.5
Documentation, Information and Culture, DIK	25.2	29.0**	19.6	15.7
Scientists, NATVET	20.8	22.9**	18.6	14.8
Number of individuals	11 448	7 914	973	2 561

NOTE: Standard deviations are in parentheses. Experience is number of years since college graduation. * equal means of non-negotiators and negotiators is rejected at the 5% level. ** equal proportions of non-negotiators and negotiators is rejected at the 5% level.

Table 3 The impact of pay review talks in different parts of the wage distribution in the private sector, state and municipality sectors. Simultaneous quantile regression.

	OLS	P10	P20	P30	P40	P50	P60	P70	P80	P90
PRIVATE SECTOR										
1. Pay review	0.010** (0.002)	0.028** (0.003)	0.020** (0.002)	0.016** (0.002)	0.013** (0.003)	0.008** (0.002)	0.002** (0.002)	-0.001 (0.002)	-0.008* (0.003)	-0.017** (0.004)
2. Women	-0.095** (0.002)	-0.067** (0.003)	-0.069** (0.002)	-0.072** (0.003)	-0.077** (0.002)	-0.079** (0.002)	-0.083** (0.002)	-0.090** (0.002)	-0.101** (0.003)	-0.117** (0.004)
3. Experience	0.038** (0.000)	0.032** (0.001)	0.035** (0.000)	0.037** (0.000)	0.039** (0.000)	0.040** (0.000)	0.041** (0.000)	0.043** (0.000)	0.044** (0.000)	0.046** (0.001)
4. Exp2*1000	-0.272** (0.011)	-0.661** (0.019)	-0.707** (0.016)	-0.744** (0.012)	-0.771** (0.012)	-0.775** (0.012)	-0.802** (0.013)	-0.828** (0.012)	-0.832** (0.013)	-0.845** (0.020)
5. Manager	0.220** (0.002)	0.171** (0.004)	0.174** (0.003)	0.180** (0.003)	0.186** (0.003)	0.195** (0.003)	0.205** (0.003)	0.220** (0.003)	0.247** (0.004)	0.290** (0.006)
6. Union	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# individuals	58 336	58 336	58 336	58 336	58 336	58 336	58 336	58 336	58 336	58 336
R ²	0.504	0.278	0.314	0.335	0.345	0.347	0.344	0.337	0.328	0.320
STATE SECTOR										
1. Pay review	0.005 (0.003)	0.025** (0.004)	0.026** (0.003)	0.024** (0.003)	0.026** (0.003)	0.020** (0.003)	0.014** (0.004)	0.004 (0.003)	0.001 (0.004)	-0.001 (0.004)
2. Women	-0.056** (0.003)	-0.038** (0.004)	-0.049** (0.004)	-0.044** (0.004)	-0.051** (0.003)	-0.052** (0.004)	-0.060** (0.004)	-0.060** (0.004)	-0.065** (0.005)	-0.050** (0.006)
3. Experience	0.028** (0.000)	0.019** (0.001)	0.024** (0.001)	0.026** (0.001)	0.029** (0.001)	0.030** (0.001)	0.032** (0.001)	0.033** (0.001)	0.036** (0.001)	0.036** (0.001)
4. Exp2*1000	-0.475** (0.013)	-0.306** (0.021)	-0.400** (0.023)	-0.444** (0.020)	-0.502** (0.019)	-0.532** (0.021)	-0.556** (0.023)	-0.559** (0.024)	-0.598** (0.023)	-0.610** (0.022)
5. Manager	0.263** (0.004)	0.219** (0.006)	0.232** (0.005)	0.249** (0.006)	0.257** (0.005)	0.264** (0.006)	0.264** (0.006)	0.267** (0.007)	0.262** (0.005)	0.278** (0.007)
6. Union	yes	yes	yes	yes	yes	Yes	yes	yes	yes	yes
# individuals	22 831	22 831	22 831	22 831	22 831	22 831	22 831	22 831	22 831	22 831
R ²	0.504#	0.253	0.299	0.321	0.332	0.339	0.344	0.351	0.359	0.359

TABLE 3 Continued

	MUNICIPALITY SECTOR								
1. Pay review	0.020** (0.002)	0.019** (0.002)	0.018** (0.002)	0.018** (0.002)	0.016** (0.002)	0.017** (0.002)	0.018** (0.002)	0.021** (0.003)	0.019** (0.004)
2. Women	-0.023** (0.004)	-0.029** (0.003)	-0.034** (0.003)	-0.036** (0.002)	-0.037** (0.003)	-0.042** (0.003)	-0.053** (0.004)	-0.061** (0.005)	-0.069** (0.008)
3. Experience	0.010** (0.000)	0.011** (0.000)	0.010** (0.000)	0.011** (0.000)	0.011** (0.000)	0.011** (0.000)	0.012** (0.000)	0.012** (0.001)	0.013** (0.001)
4. Exp2*1000	-0.172** (0.012)	-0.176** (0.000)	-0.163** (0.011)	-0.163** (0.012)	-0.154** (0.000)	-0.159** (0.012)	-0.162** (0.011)	-0.165** (0.016)	-0.164** (0.024)
5. Manager	0.154** (0.005)	0.178** (0.005)	0.204** (0.007)	0.222** (0.005)	0.239** (0.006)	0.255** (0.007)	0.276** (0.007)	0.285** (0.007)	0.306** (0.011)
6. Union	yes	yes	yes	yes	Yes	yes	yes	yes	yes
# individuals	16 643	16 643	16 643	16 643	16 643	16 643	16 643	16 643	16 643
R ²	0.241	0.311	0.360	0.404	0.441	0.474	0.499	0.516	0.521

** statistically significant at the 1% level, * statistically significant at the 5% level. Bootstrap standard errors in parentheses.

Table 4 The outcome of individual wage bargaining in different parts of the wage distribution in the private, state and municipality sectors. Simultaneous quantile regression.

	OLS	P10	P20	P30	P40	P50	P60	P70	P80	P90
PRIVATE SECTOR										
1a. No power to set wages	0.028 (0.016)	0.038 (0.020)	0.038* (0.016)	0.029* (0.015)	0.028* (0.012)	0.028* (0.013)	0.026* (0.013)	0.009 (0.022)	0.025 (0.025)	0.012 (0.032)
1b. Power to set wages	0.047** (0.010)	0.052** (0.011)	0.049** (0.010)	0.047** (0.008)	0.046** (0.008)	0.050** (0.011)	0.057** (0.010)	0.057** (0.013)	0.053** (0.014)	0.036 (0.020)
2. Women	-0.047** (0.010)	-0.031* (0.013)	-0.038** (0.012)	-0.035** (0.009)	-0.045* (0.008)	-0.047** (0.010)	-0.049** (0.012)	-0.051** (0.014)	-0.061** (0.017)	-0.075** (0.017)
3. Experience	0.021** (0.001)	0.020** (0.002)	0.019** (0.001)	0.020** (0.001)	0.018** (0.001)	0.019** (0.001)	0.019** (0.002)	0.018** (0.002)	0.019** (0.002)	0.024** (0.003)
4. Exp2*1000	-0.350** (0.041)	-0.374** (0.048)	0.353** (0.039)	-0.350** (0.045)	-0.281** (0.042)	-0.286** (0.042)	-0.285** (0.046)	-0.274** (0.051)	-0.277** (0.064)	-0.369** (0.089)
5. Manager	0.186** (0.013)	0.072* (0.029)	0.121** (0.023)	0.134** (0.017)	0.161** (0.019)	0.180** (0.019)	0.186** (0.023)	0.223** (0.022)	0.249** (0.032)	0.265** (0.037)
6. Union	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# individuals	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012
R ²	0.493	0.209	0.247	0.280	0.300	0.317	0.336	0.351	0.361	0.373
STATE SECTOR										
1a. No power to set wages	0.011 (0.013)	0.021 (0.011)	-0.002 (0.015)	0.013 (0.016)	0.012 (0.014)	0.019 (0.014)	0.016 (0.016)	0.009 (0.015)	-0.002 (0.022)	0.016 (0.024)
1b. Power to set wages	0.026* (0.012)	-0.000 (0.019)	0.011 (0.021)	0.019 (0.013)	0.023 (0.015)	0.019 (0.011)	0.022 (0.015)	0.016 (0.244)	0.020 (0.021)	0.045 (0.039)
2. Women	-0.031** (0.007)	0.027** (0.008)	-0.030 (0.009)	-0.034** (0.007)	-0.040** (0.008)	-0.039** (0.008)	-0.032** (0.008)	-0.023** (0.009)	-0.012 (0.011)	-0.018 (0.015)
3. Experience	0.018** (0.001)	0.017** (0.002)	0.019** (0.001)	0.018** (0.001)	0.017** (0.001)	0.018** (0.001)	0.018** (0.001)	0.018** (0.002)	0.020** (0.002)	0.019** (0.003)
4. Exp2*1000	-0.283** (0.030)	-0.305** (0.048)	-0.356** (0.038)	-0.309** (0.036)	-0.263** (0.041)	-0.270** (0.038)	-0.272** (0.041)	-0.248** (0.046)	-0.288** (0.059)	-0.264** (0.073)
5. Manager	0.234** (0.010)	0.201** (0.016)	0.210** (0.014)	0.229** (0.014)	0.234** (0.013)	0.241** (0.012)	0.252** (0.012)	0.249** (0.015)	0.253** (0.017)	0.244** (0.019)

Table 4 continued

	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6. Union	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# individuals	2 517	2 517	2 517	2 517	2 517	2 517	2 517	2 517	2 517	2 517
R ²	0.493	0.230	0.255	0.276	0.290	0.299	0.306	0.310	0.315	0.314
MUNICIPALITY SECTOR										
1a. No	0.009*	0.005	0.005	0.007*	0.007	0.006*	0.011**	0.012**	0.020**	0.022**
power to set	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.006)	(0.006)
wages										
1b. Power to	0.043**	0.017**	0.018**	0.022**	0.028**	0.030**	0.037**	0.045**	0.053**	0.073**
set wages	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)	(0.007)
2. Women	-0.015**	-0.009*	-0.006*	-0.006	-0.005	-0.006	-0.011**	-0.018**	-0.023**	-0.028**
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.007)	(0.010)
3. Exp	0.010**	0.008**	0.008**	0.009**	0.009**	0.010**	0.010**	0.011**	0.012**	0.014**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
4. Exp ² *1000	-0.153**	-0.135**	-0.130**	-0.136**	-0.145**	-0.155**	-0.159**	-0.171**	-0.167**	-0.216**
	(0.012)	(0.010)	(0.000)	(0.000)	(0.011)	(0.013)	(0.013)	(0.016)	(0.023)	(0.031)
5. Manager	0.193**	0.116**	0.137**	0.156**	0.173**	0.199**	0.213**	0.220	0.263**	0.261**
	(0.005)	(0.010)	(0.009)	(0.008)	(0.009)	(0.009)	(0.006)	(0.011)	(0.012)	(0.013)
6. Union	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# individuals	6 919	6 919	6 919	6 919	6 919	6 919	6 919	6 919	6 919	6 919
R ²	0.463	0.195	0.222	0.242	0.255	0.270	0.287	0.306	0.334	0.370

** statistically significant at the 1% level, * statistically significant at the 5% level. Bootstrap standard errors in parentheses. Exp is years of work experience.