Bargained Wages in Decentralized Wage-Setting Regimes

– work in progress –

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Abstract

Collective wage agreements still play an important role in the German wage bargaining system. However, there is a critical debate in Germany whether collective agreements allow the firms enough flexibility to adjust to the needs of international competition and technological change. In recent years, the social partners in some industries answered this possible lack of flexibility by introducing so called opening clauses into the collective agreements. These allow the firms to deviate from the agreement under certain circumstances.

The aim of this paper is to empirically analyse the prevalence of opening clauses in the German manufacturing sector and their impact on the wage level. To provide a basis for the empirical analyses, we have conducted a survey on the existence and intensity of opening clauses in existing central collective agreements. Thereby, our sectoral data about opening clauses are combined with those from the Salary and Wage Structure Survey 1995 and 2001, a linked-employer-employee-dataset from German official statistics.

Keywords: opening clauses, collective bargaining, wage structure
JEL Code: J31, J51

1 Introduction

In the second half of the last century Germanys system of wage setting has been dominated by regionally industry-wide central collective agreements. During the past fifteen years the situation has changed. Since the 1990's, the system of collective bargaining has been criticized to be insufficiently flexible towards international competition and technological change (cf. Artus 2001). Throughout the political discussion, employers have postulated a shift towards a decentralized bargaining system (cf. Bispinck 2003). Hence, the social partners – unions and employer associations – often have implemented flexible elements allowing wage and working time adaptations to the firm level within a central collective agreement.

Nevertheless, more flexible collective agreements do not ensure a reduction of unemployment, but they might help to secure existing employment (cf. Fitzenberger/Franz 1999, 2001). The establishment survey developed by Franz et al. (2000) emphasizes this hypothesis from an employee's point of view. The majority of workers would accept wage reduction only to safeguard their own jobs and not to create new ones. Hence, flexible elements within central collective bargaining agreements are accepted by employees if firms guarantee existing employment.

Furthermore, Fitzenberger/Franz (1999) argue that the negotiation on implementing opening clauses, pushes the unions to wage differentiation whereas the negotiated amount of the wage increase will be higher compared to a situation where the implementation of opening clauses is not considered.

In this study, it will be analysed if the implementation of opening clauses between the years 1995 and 2001 has caused this wage increasing effect. Section 2 describes the data used. In section 3, empirical evidence for the prevalence of opening clauses is presented. Section 4 analyses the impact of opening clauses on the individual wages and section 5 concludes.

2 Data

The Salary and Wage Structure Survey (SWSS) covers representative data from firms and their workers in the manufacturing sector including two independent cross sections in 1995 and 2001, respecting it is a linked employer employee data set (Abowd/Kramarz 1999). Detailed information on workers' wages, working time and individual as well as firm-specific characteristics has been collected by official statistics using a two-stage random

sample design. At the first stage, a random sample stratified by region, sector and firm size has been taken out of all firms belonging to the manufacturing sector and parts of service industries. Workers were then chosen randomly at the firm-level.

A key variable is the identifier of the individually applied collective agreement. It provides information whether a worker is paid according to an individual, a firm-specific or a central bargaining agreement. The true names of the central collective agreements are available and create an interface to enrich the sample with additional agreement-specific information.

Until now, additional agreement-specific data has not been available. As the aim of this study is to analyse the effects of decentralization within central agreements, the necessary information on flexible elements have been collected in an own survey using registered agreement texts which are provided by the Ministry of Labour Baden-Württemberg and the *WSI-Tarifarchiv* (cf. Heinbach 2005, p. 57). The IAW Data Set on Opening Clauses (IAW-OC) covers flexible elements such as opening or hardship clauses of all relevant industries in the time period between 1991 and 2004. Besides information whether certain working time or wage adaptations to the firm level are allowed, the year of introduction as well as detailed rules to each clause are reported.

Using the key variable described above the SWSS and the IAW-OC, can be joined together. The resulting data is the SWSS containing detailed information about workers, their employing firm and the collective agreement according to they are paid. Therefore, data contain possible opening clauses within the collective agreement, but not the information whether working time or wages were negotiated firm-specifically adapting opening clauses.

In each firm the most frequent wage setting system is fixed for the whole enterprise. Dummy variables for the four different central agreements are computed:

- firm-specific agreements

- individual agreements

- central collective agreements without decentralising elements

- central collective agreements with opening clauses

    - allowing firms working time adaptations
    - allowing firms wage adaptations
    - allowing firms working time *and* wage adaptations

The first two groups have been taken out of the SWSS, while the others could only be identified there as central collective bargaining agreement. Information about opening clauses exactly match with the official data using the identifier of the collective agreement and the own evaluation data. In the following, a collective bargaining agreement is called "with opening clauses on working time" if the collective agreement allows the firms to lower or to extend working time without wage compensation. If a collective bargaining agreement allows a firm-specific adjustment such as lowering or cutting the payment of vacation or the Christmas bonuses or lowering or cutting a pay increases, such a collective agreement is called "with opening clauses on wages". A collective agreement allowing both working time and wage adaptations is another category. All collective agreements neither allowing working time adaptations nor lowering or cutting wage payments is called a "without decentralising elements /opening clauses".

In the following, firms which do not belong to the manufacturing sector, wich have less than 100 or more than 10,000 workers, and less than 5 observations in the sample were dropped. As data consist of two independent random samples being pooled over time, the distribution of the variables might change over time but the variables are assumed to be independent.

3   Prevalence of Opening Clauses

The system of central collective bargaining has been decentralised partly by introducing flexible elements like opening or hardship clauses. The structure of collective agreements has become more heterogeneous due to this recent development within the collective bargaining system. At first, the industry wide system of collective agreements leads to industry-specific solutions. Therefore, the two sides of industry may negotiate either or both flexible working time and flexible wages. A more flexible working time[1] will be demanded when the order inflow is not constant over time or varies seasonally. If firms are threatened by bankruptcy, tough competition or a temporary decrease in liquidity, only a flexibilisation of wages or wage components[2] might help.

During the past fifteen years, opening clauses on working time have been introduced

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[1]Where "flexible" working time means that, being usually fixed within the collective agreement, working time can be adapted to firm-specific needs. This opening clauses allow the decreasing or increasing of weekly working time or changing work schedules within a day, a week or even within a year. The last option has often been realised as a working time account.

[2]A flexibilisation of wages is possible by postponing the point of vacation or Christmas bonuses payments by several months or cutting down these bonuses, the postponement of pay rates increases by several months or even a withdraw from a former rise.
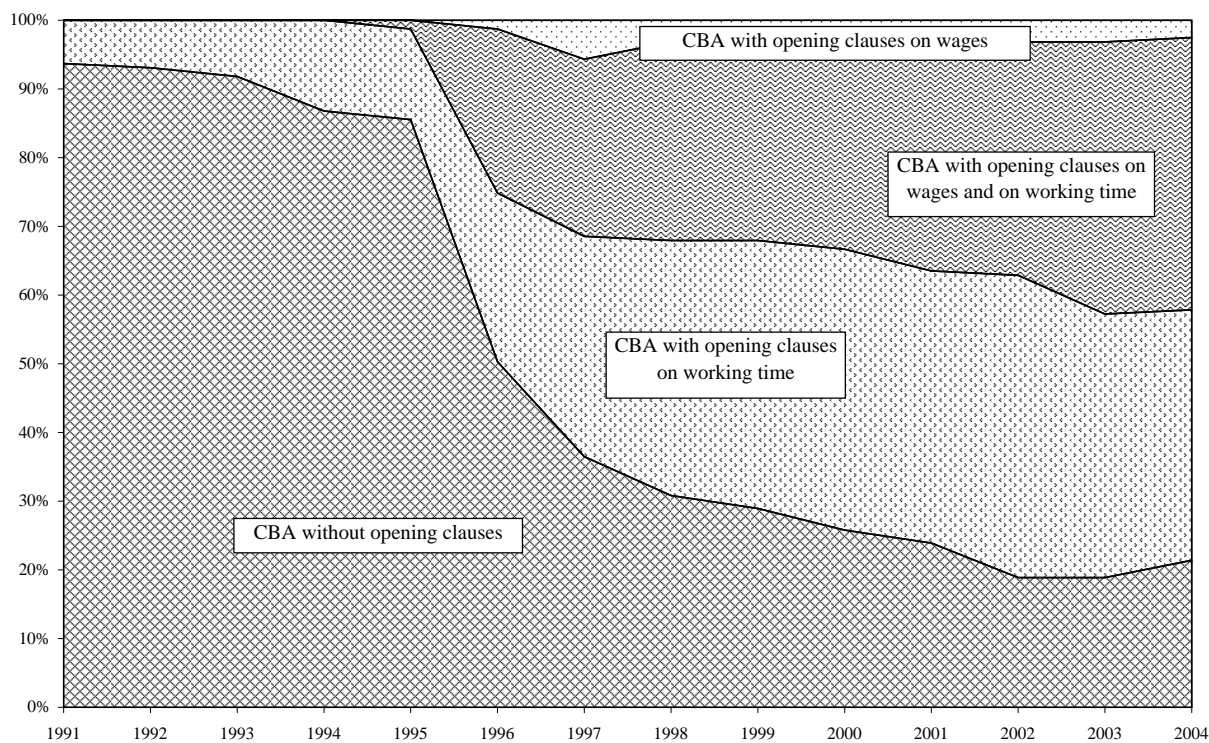
Figure 1: Manufacturing relevant collective agreements (CBA) with opening clauses, Baden-Württemberg, 1991-2001, source: IAW-OC, own calculations.

into numerous collective agreements. Using the IAW-OC and the SWSS, the share of all manufacturing relevant collective agreements in Baden-Württemberg with opening clause on working time has risen from 6% in 1991 to 76% in 2004 (figure 1). As different shares of firms and workers are covered by these agreements, table 1 reports the share of coverage each in 1995 and 2001[3].

In 1995, 14% of all manufacturing relevant collective agreements included opening clauses on working time. 19% of all firms[4] and 19% of all employees were covered by a collective agreement which included opening clauses. Until 2001, the respective figures have risen to 73% of all collective agreements including opening clauses on working time while covering nearby 90% of all firms and 89% of all employees.

Turning to opening clauses allowing a flexible adjustment of wages on firm level, the share of collective agreements including those clauses has increased from 1% in 1995 to 43% in 2004. A share of 9% of all covered firms and 10% of all covered employees applied such flexible collective agreements in 1995. The share of firms as well as of employees has increased to each 22% and 23% by the year 2001. However the collective agreements coverage has decreased in the same period from 80% to 73% of all firms and from 84% to 75% of al employees (cp. table 1).

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[3]The shares of firms and workers are computed using the SWSS data each in 1995 and 2001.

[4]All firms with at least 100 employees in the manufacturing sector in Baden-Württemberg in 1995 and 2001 respectively.

Table 1: Collective bargaining coverage in 1995 and 2001, firms with 100 to 10,000 employees in the manufacturing sector , Baden-Wuerttemberg. Source: Salary and Wage Structure Survey 1995, 2001, own calculations.

	firms [in %]		workers [in %]	
wage bargaining system	1995	2001	1995	2001
central collective agreements	80	73	84	75
with opening clauses	19	91	19	90
with opening clauses on working time	19	90	19	89
with opening clauses on wages	9	22	10	23
firm-specific agreements	2	4	2	4
without any collective coverage	17	23	14	21

The prevalence of opening clauses has increased during the past fifteen years. While numerous collective agreements do include (different) opening clauses, there are still some without any flexible elements. The various possibilities of flexibilisation of collective agreements lead to a heterogeneous structure. This has to be taken into account. But it is often ignored while analysing the effects of different wage setting regimes because suitable data is not available (cf e.g. Gerlach/Stephan 2003; **?**; Bechtel et al. 2004). In the following, the lack of data is removed using the IAW-OC. Hence, it is possible to get a better understanding of the impact of (different) types of opening clauses.

4   Analysing the impact of different flexible systems of wage setting

4.1   A first approach using pooled ordinary least squares

The SWSS provides two independent samples in 1995 and 2001. They both contain firms and workers from the manufacturing sector in Baden-Wuerttemberg. In the following, pooled ordinary least squares will be used because the variables include independent but not-identically distributed observations (cf. Wooldridge 2002, 129).

In a first step, consider a expanded Mincer wage equation by (cf. Mincer 1974) where y is the log hourly wage of an individual worker

$$y = \beta_0 + \beta_1 \cdot x_1 + \cdots + \beta_k \cdot x_k + u \tag{1}$$

and where $x_1, \ldots x_k$ are explanatory variables like age, education, tenure and others. The error u holds the usual assumptions. The coefficients $\beta_1, \ldots \beta_k$ report approximately the change in percent of y when x increases by one unit. As data consist of two samples in 1995 and 2001, the variables are independent but not identically distributed. Therefore, a dummy for the year 2001 d_2001 is added to equation 1 covering all additional effects over time like wage or price increases:

$$y = \beta_0 + \delta_0 \cdot d\_2001 + X\beta + u. \tag{2}$$

To be more specific, the intercept is allowed to be time-variant. In a second step, dummy variables for different systems of wage settings are added. The dummy d_cbawoc equals unity if the collective bargaining agreement contains opening clauses and zero otherwise. The other dummies equal unity if the individual worker is covered by a central (d_cba) or firm-specific (d_fba) bargaining agreement. The reference category are individually agreed contracts.

$$y = \beta_0 + \delta_0 \cdot d\_2001 + X\beta + \gamma_1 \cdot d\_cbawoc + \gamma_2 \cdot d\_cba + \gamma_3 \cdot d\_fba + u. \tag{3}$$

As it has been pointed out in section 3, the prevalence of collective agreements containing opening clauses has increased markably between 1995 to 2001. To analyse the impact of introducing opening clauses on the wage (cf. Fitzenberger/Franz 1999), equation 4 will be expanded by adding an interaction dummy $d\_2001cbawoc = d\_2001 \cdot d\_cbawoc$ which equals unity if the collective agreement contains opening clauses in 2001 and zero otherwise

$$y = \beta_0 + \delta_0 \cdot d\_2001 + X\beta + \gamma_1 \cdot d\_cbawoc + \gamma_2 \cdot d\_cba + \gamma_3 \cdot d\_fba + \delta_1 \cdot d\_2001cbawoc + u. \tag{4}$$

Equation 4 is estimated using ordinary least squares while accounting for heteroscedasticity using heteroscedasticity-consistent standard-errors (cf. White 1980).

The aim of this study is to analyse the effect of different systems of wage setting on bargained wages. In a first step, the log of gross hourly wage is computed using the gross monthly compensation[5] divided by the monthly working time[6]. Then, the log wage y is explained using a large set of exogenous variables x_i, which are to be described shortly. Individual workers' age and age squared control for seniority, because older workers earn often more than their younger colleagues. However, an increase in years of age will not result in the same increase in log wage. Other key variables are the years of schooling and tenure which cover the individual and firm-specific achieved human capital. As the return of tenure is assumed to be nonlinear, squared tenure is considered. Dummy variables account for individual specific characteristics like sex, qualification level[7], payment type[8]

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[5]Gross monthly compensation without any bonuses and premiums

[6] Working time without any overtime

[7]Workers are put into four groups: high skilled, skilled, semi skilled or unskilled workers.

[8]Workers were paid according to their working time or receive a piecework or bonus wage.

and extra ordinary working time[9]. Firm-specific characteristics are taken into account using dummy variables for different classes of firm size and the industry sector[10] to which the firm constists. Descriptive statistics for the wage under different systems of wage setting can be found in appendix A table 3 and for the covariates in table 4.

Table 5 reports the results of the estimates of equation 4, whereas four different specifications of covariates are presented to check for robustness of the estimation. Model (3) and (4) include age and tenure squared whereas the square of these variables is left out in (1) and (2). Model (2)-(4) use an additional dummy for workers in firms with more than 200 and less than 499 employees. At last, model (4) uses five dummies to cover the different systems of wage setting (cf. section 2).

The coefficient of the dummy variable for the year 2001 δ_0 is positive and highly significant with all models. It indicates an increase of the intercept by the year 2001 of nearby 0.1. So, the gross hourly wage increases during from 1995 to 2001 on average by 10%, holding all other variables constant. The coefficients for the dummy variables for the four different systems of wage setting are all positive and significant, too. As individual agreed wages are the reference category, this indicates a higher wage level with all collective agreed wages by at least 5.5 %. The coefficients for the central collective agreements with or without opening clauses differ not significant. Model (4) indicates that a collective agreement with opening clauses on working time leads to 6.1% wage increase, whereas the wage increase of a collective agreement with opening clauses on wages or wages and working time is about each 3.6% or 4.3%, but this holds only in 1995. In 2001, the coefficient of the interaction dummy δ_1 has to be taken into account. It is about 2% and significant with all models. Therefore, the wage increase under a collective agreement with opening clauses differs in 2001 from that of those collective agreements without opening clauses.

The other coefficient all have the expected sign. Especially individual characteristics like age, tenure and education have an signifcant effect on the wage. But the impact of tenure and age is not linear, because the coefficients of the squared variables are negative and significant. An additional year of schooling increases the wage by 1.6%. Female workers will earn about 11.5% less than their comparable male colleagues. The wage increase is positive and significant when the worker is skilled compared to a unskilled worker by at least 6.4% and the wage increases also if the level of skill increases (high skilled: 23.7%). Different types of incentive wages (bonus wage, piecework wage) let the wage level increase compared to a wage based on working hours. Working on Sunday or during night also increases the hourly wage significantly. Furthermore, wages increase with the firm size. If the reference category are firms with 100 to 199 employees, this increase is even higher.

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[9]Extra ordinary working time like working on sundays or during night.

[10]Industry sector is computed using the two digit NACE classification.

For workers in firms with more than 1000 employees the wage is on average 7% higher.

To evaluate the different models, additional testing like LR-test, Wald-test and White-test for detecting heteroscedasticity are conducted. Heteroscedasticity can be found in all models. Therefore, equation 4 has been estimated using robust OLS. A Wald-test with the null $\delta_0 = \delta_1 = 0$ does not hold on any reasonable significance level. Using a likelihood-ratio test the goodness of fit with different models is evaluated. The test favors the model used. There is no evidence for using a restricted model.

The positive sign with δ_1 covering the implementation of opening clauses beetween 1995 and 2001 can be interpreted as a wage increasing effect. Fitzenberger/Franz (1999) argue using an insider-outsider framework that the implementation of opening clauses leads to a higher wage increase because unions take the economic situation of the firms into account. They conduct "wage discrimination" by splitting the firms into two groups: a better-off group that is able to pay a higher wage increase and a group of firms which will negotiate firm-specific deviations adapting opening clauses immediately. The model which is used does not account for causality, i.e. variables controlling the effect of opening clauses could be endogenous. In case heterogeneous firms or industry sectors are able to apply opening clauses, the dummy controlling opening clauses would be highly correlated with the firm or industry-specific performance, especially in a case were the relevant variable is not explicitly modeled or not observable.

4.2   Endogeneity of the opening clauses dummy

If one or more variables of equation 4 are not strictly exogenous, all corresponding coefficients will be inconsistent (cf. Wooldridge 2002, p. 83). As the intention of this study is to messsure the effect of the system of wage setting – especially of that of collective agreements with opening clauses – on the individual wage, the dummy should be checked to be exogenous or not.

From an economic point of view, it has to be called in question that the effect of opening clauses found in section 4.1 is strictly exogenous. Assuming that collective agreements depend on firm or industry specific characteristics not explicitly modeled, it holds that $E(d_c bawo|u) \neq 0$. This is satisfied if the negotiations on introducing opening clauses depend e.g. on the firm structure. In an industry with a very homogeneous set of firms, i.e. with firms of approximately equal productivity or competitiveness, opening clauses may not be a task to be taken into account while negotiating wage increases. But if the firms are heterogeneous regarding productivity, competitiveness or order inflow, their preferences towards collective agreements could decline (Lehmann 2002). Consequently, firms being

faced to international competition are likely to demand more flexibility within collective bargaining agreements (Artus 2001). As a result, opening clauses may be introduced. So, firms which prefering highly to quit the collective agreement coverage will not leave collective bargaining by adaptating opening clauses.

4.3 A second estimation controlling endogeneity

As pointed out, flexible elements within collective bargaining agreements could be endogenous. Hence, the corresponding variable d_cbawo can be expressed as a function of variables z which include the situation of competitiveness on industry level:

$$d\_cba = g(x, z) + v. \tag{5}$$

Assume that the variables z are not correlated with the error u in equation 4, i.e.

$$cov(z, u) = 0, \tag{6}$$

whereas z and d_cba are correlated. Then equation 5 can be rewritten as

$$d\_cba = \beta_0 + \delta_0 \cdot d\_2001 + X\beta + \gamma_1 \cdot d\_cbawoc + \gamma_3 \cdot d\_fba + \delta_1 \cdot d\_2001cbawoc + Z \cdot \theta + v. \tag{7}$$

If $\theta \neq 0$, $d_c ba$, z being partially correlated and, equation 6 holding, z are instrument variables. Equation 4 can then be rewritten as

$$y = \beta_0 + \delta_0 \cdot d\_2001 + X\beta + \gamma_1 \cdot \widehat{d\_cbawoc} + \gamma_2 \cdot d\_cba + \gamma_3 \cdot d\_fba + \delta_1 \cdot d\_2001cbawoc + u. \tag{8}$$

Collective agreements without opening clauses are instrumented, because there are flexible systems of wage setting as alternatives like agreements with opening clauses, firm-specific and individual agreements. The difficulty of this two stage least squares estimation using instrument variables is to find "good" instruments for the Dummy d_cba. As already pointed out, a heterogeneous set of firms, international competition or technological change can be a reason to implement more flexible rules within a central agreement. As a proxy for this, industry sector specific key data as number of employed or export quota[11] is joined to each observation. The partial correlation coefficients are presented in table 2. Obviously, a negative correlation can be found between a collective agreement without opening clauses and the export quota, i.e. the higher the export quota the more likely opening clause are to be implemented.

The total employment is another variable assumed to be exogenous , but from an economic point of there seems to be no relation between more flexibility and employment.

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[11]Export quota is the share of foreign turnover to total turnover.

Table 2: Partial correlation between instrumented and instrumental variables

instruments	CBA w/o OC	CBA with OC
employment	0.4211	-0.4055
export quotas	-0.3097	0.3392

Unfortunately, due to a change in the industry sector specification, change in percentage of the employment cannot be reported. Furthermore, no additional figures are available.

Table 6 reports the results of the estimates of equation 8 using different instrument variables. Model (1) to (3) instrument the dummy d_cba, whereas model (4) instruments d_cbawo as an alternative. Model (1) and (4) use export quotas and employment of the industry sector as instrumental variables. Unfortunately, data on foreign turnover and employment is not available for the energy, water and construction sector, so that these observations had to be dropped . Model (2) and (3) use alternatively only one instrumental variable.

The coefficients within the four models are significant and differ only little. Compared to the results of the pooled OLS estimation in table 5 especially (3) and (4) the amount of most coefficients is approximately equal. Concentrating on the coefficients of the different systems of wage setting, it can be found that collective bargained wages are higher than individual ones. The sign of the coefficient δ_1 is positive and significant in model (1) to (3), but insignificant in model (4). This may be caused in a misspecification of the instrumented variables and must be checked next.

To evaluate the different models, Sargan test on overidentifying instrumental variables and a Hausman test with the null that difference in coefficients are not systematic are conducted. The Sargan test has induced that only one instrumental variable should be used. The Hausman test has found that there are no systematic differences in the coefficients. So, pooled OLS would be consistent and efficient, although in the next step, robust 2SLS should be computed to control for heteroscedasticity.

5   Summary and Outlook

In this study, the impact of different wage setting systems is estimated using data from official statistics and additional information about decentralized but still central collective bargaining agreements. As data consist of two independent samples from the manufacturing sector in Baden-Württemberg in 1995 and 2001, pooled ordinary least squares

techniques are used including a time variant intercept and a interaction variable controlling for decentralized collective agreements in the year 2001. In a second step, an instrument variable estimator via 2SLS is used to control for endogeneity of the central wage setting regime.

Empirical results point out, that individual wages under collective bargaining coverage are significantly higher than individual agreed ones. These finding are similar to other studies using the same or analogous data (Bechtel et al. 2004; Gerlach/Stephan 2003; **?**). Furthermore, the paper concentrates on if the implementation of opening clauses between 1995 to 2001 has an additional wage increasing effect as mentioned in a theoretical analysis by (Fitzenberger/Franz 1999). Accordingly to them, the implementation of opening clauses causes an wage increasing effect, because unions will conduct a wage differentiation policy. Furthermore, the share of firms covered by a central agreement and paying more than the collective agreed wage is still high (Schnabel 2004; Strotmann 2003). Oppositely, the effect found by the different wage setting regimes could have other causes, which are not yet taken into account. The estimated model using instrumental variables is therefore a first step.

The IAW data on opening clauses provide only the information if a collective agreement contains opening clauses. The information whether a single firm adapts opening clauses to lower wages or to change working time still is missing. So, the results do not reflect the effect of adapted opening clauses on firm level.

To sum up, the prelimnary results show that during the past 10 years opening clauses have been implemented into numerous central collective agreements, while it seems that the implemented flexibility is not for free.

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A Tables

Table 3: Descriptive statistics of gross hourly wages, blue-collar workers firms with 100 - 10,000 employees in the manufacturing sector, Baden-Württemberg. Source: Salary and Wage Structure Survey 1995, 2001, own calculations.

gross hourly wages [€]	1995				2001			
	collective agreement		firm-specific agreement	individual agreement	collective agreement		firm-specific agreement	individual agreement
	w/o opening clauses	w. opening clauses			w/o opening clauses	w. opening clauses		
mean	2.60	2.57	2.56	2.43	2.66	2.74	2.70	2.54
std.dev.	0.21	0.23	0.24	0.24	0.19	0.23	0.19	0.25
# obs.	32279	7355	1151	6435	1408	12855	817	4027
# firms	848	198	31	224	44	330	23	150

Table 4: Descriptive statistics of covariates, firms with 100 - 10,000 employees in the manufacturing sector, Baden-Württemberg.

Source: Salary and Wage Structure Survey 1995, 2001, own calculations.

	1995				2001			
	collective agreement		firm-specific agreement	individual agreement	collective agreement		firm-specific agreement	individual agreement
	w/o opening clauses	w. opening clauses			w/o opening clauses	w. opening clauses		
mean of age	39.72	39.78	39.18	38.55	41.24	40.56	40.77	39.75
mean of tenure	12.24	11.24	11.04	8.54	11.41	12.66	11.50	8.69
mean of years of schooling	10.46	10.36	10.41	10.29	10.44	10.44	10.45	10.28
share of female	20%	22%	27%	28%	5%	18%	15%	30%
share of unskilled	23%	18%	16%	26%	17%	20%	16%	29%
share of semi-skilled	19%	40%	37%	34%	11%	25%	27%	42%
share of skilled	38%	27%	32%	34%	51%	31%	28%	25%
share of high skilled	20%	15%	16%	6%	21%	24%	29%	4%
share of working time wage	68%	84%	75%	79%	87%	75%	83%	77%
share of premium wage	9%	10%	12%	5%	4%	11%	10%	7%
share of piecework wage	18%	1%	7%	9%	1%	10%	1%	7%
share of working on Sundays	7%	30%	16%	6%	20%	21%	22%	9%
share of working during night	30%	50%	32%	19%	24%	43%	44%	29%
share of married	65%	65%	65%	63%	66%	65%	62%	63%

Table 5: Regression analysis of individual log gross hourly wage in the blue-collar workers' group in the manufacturing sector, Baden-Württemberg, 1995 and 2001. (Source: SWSS 1995, 2001)

	(1)	(2)	(3)	(4)
age/10	0.002	0.002	0.101	0.101
	(0.001)***	(0.000)***	(0.000)***	(0.000)***
$(age/10)^2$			-0.012	-0.012
			(0.000)***	(0.000)***
tenure/10	0.039	0.038	0.086	0.086
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
$(tenure/10)^2$			-0.014	-0.014
			(0.000)***	(0.000)***
years of schooling	0.015	0.015	0.016	0.016
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
female	-0.110	-0.110	-0.115	-0.115
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
high skilled	0.249	0.249	0.237	0.237
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
skilled	0.182	0.182	0.174	0.174
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
semi-skilled	0.068	0.068	0.064	0.064
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
bonus wage	0.053	0.052	0.051	0.049
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
piecework wage	0.109	0.108	0.106	0.105
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
piece rate plus bonuses	0.095	0.095	0.090	0.090
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
mixed wage	0.034	0.034	0.033	0.032
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Sunday working	0.083	0.082	0.080	0.081
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
night work	0.073	0.072	0.070	0.070
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
firms with 200 to 499 employees		0.024	0.023	0.023
		(0.000)***	(0.000)***	(0.000)***
firms with 500 to 999 employees	0.035	0.050	0.047	0.048
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
firms with more than 1000 employees	0.058	0.073	0.070	0.071
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Dummy 2001	0.102	0.101	0.099	0.099
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
CBA w/o Opening Clauses	0.055	0.055	0.053	0.053
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
CBA with OC (on working time)	0.060	0.058	0.055	0.061
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
CBA with OC on wages				0.036
				(0.004)***
CBA with OC on wages and working time				0.043
				(0.000)***
Firm-specific agreement	0.071	0.069	0.071	0.070
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
d2001ftv_mok	0.019	0.021	0.022	0.021
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Industry dummies	yes	yes	yes	yes
Constant	2.206	2.193	1.982	1.980
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Observations	66174	66174	66174	66174
R-squared	0.627	0.628	0.638	0.638

Robust p values in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Regression analysis of individual log gross hourly wage using instrumental variables, blue-collar workers' group in the manufacturing sector, Baden-Württemberg, 1995 and 2001. (Source: SWSS 1995, 2001)

	(1)	(2)	(3)	(4)
Instrumented variable	d_cba	d_cba	d_cba	d_cbawoc
Instrumental variables	export quotas	export quotas	employment	export quotas
	employment			employment
age/10	0.096	0.096	0.096	0.097
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
$(\text{age}/10)^2$	-0.012	-0.012	-0.012	-0.012
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
tenure/10	0.089	0.089	0.090	0.087
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
$(\text{tenure}/10)^2$	-0.015	-0.015	-0.015	-0.014
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
years of schooling	0.016	0.016	0.016	0.015
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
female	-0.113	-0.113	-0.114	-0.113
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
high skilled	0.230	0.230	0.231	0.229
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
skilled	0.179	0.179	0.178	0.179
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
semi-skilled	0.064	0.064	0.062	0.065
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
bonus wage	0.048	0.048	0.049	0.047
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
piecework wage	0.101	0.101	0.102	0.100
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
piece rate plus bonuses	0.086	0.086	0.084	0.086
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
mixed wage	0.028	0.028	0.028	0.028
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Sunday working	0.083	0.083	0.084	0.083
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
night work	0.069	0.069	0.070	0.068
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
firms with 200 to 499 employees	0.022	0.022	0.023	0.021
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
firms with 500 to 999 employees	0.050	0.049	0.052	0.046
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
firms with more than 1000 employees	0.076	0.075	0.078	0.072
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Dummy 2001	0.097	0.099	0.084	0.112
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
CBA w/o Opening Clauses	0.048 (i)	0.052 (i)	0.025 (i)	0.078
	(0.001)***	(0.000)***	(0.339)	(0.000)***
CBA with OC	0.050	0.053	0.033	0.071 (i)
	(0.000)***	(0.000)***	(0.082)*	(0.000)***
Firm-specific agreement	0.057	0.059	0.044	0.072
	(0.000)***	(0.000)***	(0.003)***	(0.000)***
d_2001cbawoc	0.024	0.022	0.035	0.003
	(0.002)***	(0.005)***	(0.007)***	(0.876)
Industry dummies	yes	yes	yes	yes
Constant	1.998	1.995	2.013	1.982
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Observations	59859	59859	59859	59859
Root MSE	0.1419	0.1418	0.1423	0.1418
Sargan statistic	(0.2873)			(0.1351)

Robust p values in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

(i) = instrumented variable