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Implicit contracts and industrial relations - Evidence from German employer-employee data

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Abstract

I test the evidence for implicit contracts across different regimes of industrial relations in Germany. The result is that there is strong evidence for implicit contracts. Comparing regimes of industrial relations, I find stronger support for implicit contracts in firms with individual bargaining and when a works council exists.

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1 Introduction

Unions and works councils are commonly regarded as crucial for wage rigidity. One potential reason for a role of these institutions is, that they may affect the prevalence of implicit wage contracts. The main idea of implicit contracts (Azariadis, 1975) is as follows: Workers are risk averse but have no access to capital market. Firms, in contrast, are risk neutral. Under this condition, a firm can insure a newly hired worker against a wage drop by offering an implicit contract with a smoothed path of wage growth. A consequence is that the level of wages depends on the labor market conditions at the beginning of employment. If, in contrast, wages are set on a spot market, the wage depends on current conditions.

Theoretically, the role of institutions for implicit contracts is unclear. The model of Rudanko (2009) implies that unionization raises the workers' share of the initial matching surplus and thus lowers the incentive for implicit contracts. However, according to Malcomson (1983) and Horn and Svensson (1986) unions provide workers and firms with a device to enforce credible state-contingent contracts. This would rise the prevalence of implicit contracts in unionized firms. Similarly Hogan (2001) argues that unions help implementing implicit contracts by monitoring labor relations.

Beaudry and DiNardo (1991) introduced a method to empirically test the implications of implicit contracts and found evidence for implicit contracts in the U.S. Several studies applied this method for other countries. For example, Kilponen and Santavirta (2010) found some evidence for implicit contracts in Finland; however, in contrast to the U.S., the evidence for a spot market is stronger. The authors argue that the differences between Finland and the U.S. may be explained by the higher unionization in Finland, which is in line with the view that unionization lowers the incentive for implicit contracts. The same interpretation is suggested by McDonald and Worswick (1999) when they compare Canada with the U.S.

Despite the potential role of wage setting institutions regarding the prevalence of implicit contracts, only a few studies directly analyze their relation. For the U.S., Grant (2003) found that implicit contracts are stronger for union workers. Cardoso and Portela (2009) use in a study on Portugal a different method as suggested by Guiso et al. (2005). Similar to Grant (2003), they found that in firms with collective bargaining, there is more evidence for implicit contracts. This finding supports the view that unions help monitor implicit contracts.

There are many studies on wage setting institutions in Germany. One example is Gartner et al. (2013). In this study I analyzed with co-authors the effect of current changes of unemployment on wage changes. We found that in face of an adverse shock individually bargained wages are more rigid than wages in unionized firms, however we did not test explicitly for implicit contracts to explain this pattern.

Up to now, only one study have investigated the relation of implicit contracts and wage setting institutions in Germany. Gürtzgen (2014) applies the method introduced by Guiso et al. (2005) and use the firm's value added to capture shocks. She finds that collective

institutions help to enforce implicit contracts. To be more comparable with the other literature I apply the Beaudry and DiNardo (1991) method. For the same reason I use regional unemployment as proxy for the economic conditions.

2 Institutional background and data

In Germany, workers are represented by two institutions. First, unions are allowed to bargain on wages at the sectoral or firm level; second, works councils have rights of information, consultation and co-determination. Works councils may be formed in establishments with more than four employees. In 1999, collective wage contracts that were negotiated by unions at the sectoral level were applied in 53.4 percent of all private-sector establishments. Firm-level wage contracts were applied in 4 percent of all establishments. The remaining establishments negotiated the wage individually. The second institution, works councils, exists in 14 percent of all establishments. The combination of these institutions results in six regimes of industrial relations. These regimes will be analyzed in the empirical section.[1]

I use the linked employer-employee data set of the Institute of Employment Research (IAB), which combines information on establishments in Germany and information on employees covered by the social security system.

The employer data come from the IAB-establishment panel, an annual survey from 1993 until present. The survey provides general information on the establishment, such as the workforce composition, the branch, the firm size, the level of wage negotiation, and the existence of a works council. The employee data come from the social security system in Germany. These data include information on sex, age, qualification, daily exact information on job spells and the wages of employees. The data cover approximately 80 percent of all employed persons in Germany. Civil servants (Beamte), the self-employed and unpaid family workers are not included. The data are described in more detail in Alda et al. (2005).

The sample is refined as follows: It covers only the private sector (without farming). Establishments with fewer than 5 employees are excluded because they do not have a works council. Establishments with more than 500 employees are excluded because nearly all of them have a works council and apply a collective contract. Thus, in these establishments, there is no variation in industrial relations. To identify the date of hiring happened before the German unification in 1990 I have to exclude East Germany.

The variable of interest is the gross daily wage. The wage includes bonus payments, such as vacation payment. One shortcoming of the data is a lag of information on the exact working time. Thus, the daily wage is calculated for full time workers only and part-time workers are excluded. Nevertheless it should be kept in mind that the dependent variable measures in fact earnings and can vary by changes in hours as well as by changes in hourly wages. Note however also, that the extent of paid overtime in Germany is quite lower than, for example, in Britain or in Japan (see Hart, 2004, p. 13).

[1] For more details on collective contracts and works councils in Germany, see for example Gartner et al. (2013).

Furthermore, apprentices and workers with an implausible low daily wage are excluded. Because the data come from the social security system, the wages are right-censored on the contribution limit. Right-censoring concerns approximately 13 percent of the employees, who are also excluded from the sample.

I use a sample for the years 1995 to 2004. The first year of the survey with information on bargaining levels and works councils is 1995. The observation period ends in 2004 due to a structural break in the definition of unemployment in 2005. I use the regional unemployment rate according to the Federal Employment Agency for 328 NUTS3-districts. The period covers more than a full business cycle. To be more specific, unemployment declined between 1998 and 2000, while it increased during the other years. Finally, the data set includes approximately 2.7 million observations (employees×year) in 14,000 establishments.

3 Estimation approach and results

The model of wage setting on a spot market and the model of implicit contracts are nested in the following econometric equation:

$$log(w_{it}) = \beta_c u_t + \beta_h u_{h[i]} + \beta_{min} \min\{u_j\}_{j \in J[i]} + \beta_{max} \max\{u_j\}_{j \in J[i]} + \phi x_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

$log(w_{it})$ is the log of the daily wage deflated by the consumer price index. $J[i]$ is the set of years from hiring worker i to the current year t. u_t is the current unemployment rate. $u_{h[i]}$ is the unemployment rate at the time of hiring. If the current wage is only influenced by the current condition, the wages are set on a spot market. Then, β_c is negative while the other βs are zero. If the current wage is influenced by the conditions at the time of hiring, there is evidence for implicit contracts. Then, β_h is negative, and the other βs are zero. If, in addition to the implicit contracts, the workers are mobile, then they can renegotiate the wage if the outside option is better. Then, the lowest unemployment rate since hiring affects the current wage, β_{min} is negative and the other βs are zero. Similarly, there may be mobility of employers in the sense that they can renegotiate the wage when there are more outsiders that could replace the insiders. Then, the wage is determined by the highest unemployment rate since hiring and β_{max} is negative.

x_{it} are time-variant worker characteristics. Time fixed effects γ_t are included to capture trends and shocks that affect the wages but not the labor market condition u. A worker-specific fixed effect δ_i is included to capture worker heterogeneity. To avoid the Moulton (1986) problem of too-small standard errors when using a macroeconomic variable for estimating individual effects, I use the regional unemployment rate u_t and calculate robust standard errors.

Table I shows the results for models that are pooled across the regimes of industrial relations. I separately estimate models with one unemployment variable (column 1 to 4) and a nested model (column 5). There is a strong effect of the lowest unemployment during the match. When the lowest unemployment rate since the hiring is 1 percentage

Table I: Estimation of wage with pooled data

	(1)	(2)	(3)	(4)	(5)	(6)
u_t	-0.10***				-0.11***	0.02
	(0.02)				(0.02)	(0.02)
$u_{h[i]}$		0.25***			0.45***	
		(0.10)			(0.10)	
u_{max}			0.29***		0.50***	
			(0.03)		(0.03)	
u_{min}				-0.57***	-0.69***	-0.58***
				(0.03)	(0.04)	(0.03)
N	2,581,127					

Notes: Dependent variable. log of daily wages; u is regional unemployment for 328 NUTS3-districts. Control variables are: potential experience and its square, tenure and its square, dummies for 6 categories of education, 10 occupational groups, 8 classes of firm size, 10 sectors and year dummies. Robust standard errors in parenthesis, * $p < .1$; ** $p < .05$; *** $p < .01$

Table II: Estimation of wage across regimes of industrial relations

bargaining	individual		firm		sector	
works council	no	yes	no	yes	no	yes
u_t	0.08	0.32***	-0.55**	0.06	-0.23***	0.01
	(0.09)	(0.07)	(0.27)	(0.06)	(0.07)	(0.02)
u_{min}	-0.84***	-1.06***	0.41	-0.60***	-0.82***	-0.47***
	(0.17)	(0.14)	(0.45)	(0.10)	(0.14)	(0.04)
N	187	213	21	269	197	1,656

Notes: Observations N in thousands, further notes see Table 1.

point higher, the wage is 0.57 percentage lower (column 4). This result is evidence for implicit contracts with worker mobility.

The effect of the contemporary unemployment in column 1 is -0.1. This specification is basically a wage curve model, and the size of the effect is exactly what Blanchflower and Oswald (1994) state as an economic law. The same size is found in the nested specification. However, this result is not robust. When I include only u_{min} and u_t (column 6), the effect of contemporary unemployment becomes insignificant.

Concerning maximum unemployment, I find a pattern that is also found by Devereux and Hart (2007) for Britain: a positive effect of u_{max}. This result is not easy to explain; however, because Germany is a country with strong employment protection one should not expect a negative sign for maximum unemployment. The variables with implausible signs (maximum unemployment and the unemployment at hiring) are excluded in the specification in column 6. This specification is the baseline for estimating the model separately for the six different regimes of industrial relations (see Table II).

The evidence for implicit contracts combined with worker mobility is stronger for individually negotiated wages than for wages negotiated at the sectoral level. This result

could explain the downward wage rigidity in firms where wages are bargained individually, which is found by Gartner et al. (2013).

Furthermore, the results demonstrate that the interaction of institutions is important for wage setting: The difference between individually negotiated wages and wages negotiated at the sectoral level is larger when a works council exists. The result for firms with works councils and firm-level bargaining lies in between. Interestingly, this result is consistent with Rudanko (2009) as well as with Malcomson (1983) or Hogan (2001). On the one hand, the incentive for implicit contracts may be lower because the workers' share on the surplus is higher when unions negotiate wages. On the other hand, the results show that monitoring institutions such as works councils may be helpful for implementing implicit contracts.

For establishments with firm-level contracts and without works councils, the effect of the lowest unemployment is insignificant, and the effect of the current unemployment is significantly negative, meaning that wages are set on a spot market and not by implicit contracts. This result is again consistent with both theories: The workers' share on matching-surplus in these establishments is higher than for individually bargained wages, what lowers the incentive for implicit contracts, and there is no institution for monitoring implicit contracts.

The results are robust for different specifications (results are available upon request). If the sample is restricted to the years 1995 to 2001 or to 1997 to 2004, the results are identical. Furthermore, if I apply the estimation only to the manufacturing sector or to men, the result is stable. The same is true when u_{max} and $u_{h[i]}$ are included or when a time trend instead of dummies is used.

The finding that works councils enforce implicit contracts is consistent with the results of Gürtzgen (2014). However, in contrast to my results she founds that also collective contracts help to implement implicit contracts. She uses the establishment's value added as proxy for economic conditions instead of unemployment. An explanation for the different results may be that unions help to insure against firm specific shocks but do not so against macroeconomic shocks. In future research the different levels of shocks should be more carefully addressed.

4 Conclusion

The paper analyzes the role of works councils and unions for the prevalence of implicit contracts in Germany. There is strong evidence for implicit contracts combined with worker mobility.

The support for implicit contracts is stronger in firms with individual bargaining and if a works council exists. The analysis of the interaction of institutions has revealed that two models, the model of Rudanko (2009) and that of Malcomson (1983) and Hogan (2001), that appear mutually exclusive at first glance may both work in reality.

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