Schmollers Jahrbuch 123 (2003), 359 – 381
Duncker & Humblot, Berlin

Works Councils and Fixed-Term Employment: Evidence from West German Establishments*

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Abstract

Works councils and employees represented by them have diverse interests with regard to the use of fixed-term contracts. On the one hand, these contracts may be a threat to the position of permanent workers. On the other, the use of atypical work in the establishment could also increase permanent workers' job security, as suggested by dual labour market theory. Our empirical results reflect this ambiguity. While the existence of a works council influences the likelihood of employing fixed-term workers positively, it is negatively associated with their share in total employment in establishments using fixed-term labour. Empirical analysis of worker flows suggests that this effect is due to differences in the number of fixed-term workers, rather than differences in the duration of contracts.

Zusammenfassung

Die Position von Betriebsräten wie Arbeitnehmern gegenüber befristeten Neueinstellungen ist uneindeutig. Zum einen können befristet Beschäftigte für die „Insider" eine Bedrohung darstellen, zum anderen können sie zu einer (weiteren) Stabilisierung der Stammbelegschaften beitragen. Unsere empirischen Befunde dokumentieren die Ambiguität: Unter sonst gleichen Bedingungen geht die Existenz eines Betriebsrates einerseits mit einer höheren Wahrscheinlichkeit einher, dass Unternehmen befristete Neueinstellungen vornehmen. Andererseits ist der Anteil befristet beschäftigter Arbeitnehmer in Betrieben mit einer gewählten Arbeitnehmervertretung signifikant niedriger als in vergleichbaren Unternehmen ohne Betriebsrat. Diese Unterschiede sind weniger mit

* *Acknowledgement:* This paper was prepared for the workshop of the Forum Mitbestimmung und Unternehmen and Witten-Herdecke University on works councils and employee participation, which took place on February 19th, 2002. We wish to thank the participants of the workshop and in particular the organiser, Bernd Frick, as well as two anonymous referees and our colleagues at the ZEW for helpful comments and suggestions. We also wish to thank the Institute for Employment Research of the Federal Labour Services in Germany (IAB) for the opportunity to work with the IAB-Establishment Panel and for its hospitality. Financial support from the Deutsche Forschungsgemeinschaft (DFG) under the project "Technological progress, skills and labour demand" (PF 331 / 1 – 3) is gratefully acknowledged.

der unterschiedlichen Laufzeit der Verträge, als vielmehr mit der unterschiedlichen hohen Zahl an befristet Beschäftigten zu erklären.

JEL Classification: J53, J42, J23

1. Introduction

In the public discussion on the flexibility of German labour markets, both the regulation of fixed-term employment contracts (FTCs)[1] and the co-determination by works councils[2] have been major issues. Employers often view works councils as a reason for inflexibility, because they possess consultation rights on individual dismissals and may thus raise institutional firing costs. Similarly, restrictions on the use of FTCs are regarded as detrimental for firms' employment flexibility, since these employment relationships are terminated without dismissal at the end of the agreed term and, hence, no firing costs are incurred. In this paper, we ask how these two institutions interact. For instance, if works councils do in fact reduce employment flexibility, employers in establishments with works councils may have a higher incentive to use FTCs. On the other hand, works councils may try to prevent the use of FTCs as a flexible alternative to permanent contracts.

In a previous study (Boockmann / Hagen 2001), we found that the probability of employing FTC workers is increased by the existence of works councils and the coverage of the establishment by legal employment protection. This may be interpreted as evidence for the hypothesis that these institutions raise firing costs for permanent contract workers, making the use of FTC workers more profitable. In this paper, we also look at whether the share of FTC workers in total employment is increased by the existence of a works council. In a second step, we use data on employment flows to analyse whether works councils also have an impact on the duration or stability of FTCs.

There is an extensive literature on the economic effects of German works councils on economic variables such as company performance, hirings and separations, or R&D activity (see, for instance, Addison et al., 2001, Frick, 1996, 1997, Frick / Sadowski, 1995, Hübler / Jirjahn, 2001, Schnabel / Wagner, 1994). However, the link between works councils and atypical work has so far

1 By FTCs, we mean fixed-term contracts regulated by the Employment Promotion Act of 1985 (revised in 1996) and the Law on Part-Time and Fixed-Term Employment Contracts of 2001. In 1999, about 7 per cent of all West German employees (excluding workers in vocational training) were working on the basis of an FTC (see Boockmann / Hagen, 2001).

2 Since we focus on the role of works councils in the following, we use "co-determination" and "works councils" as synonyms, although there may exist structures for co-determination other than works councils.

only been addressed by Düll and Ellguth (1999), who found a positive effect of the works council on the probability of using FTC workers but a negative effect on the share of FTC in total employment.

The data set used is the IAB Establishment Panel for West Germany. In addition to information on FTCs and works councils, this data set also includes information on the application of (firm- or industry-wide) collective wage agreements. To control for collective wage agreements may be important since companies with works councils are more likely to be covered by collective agreements than other firms.

The plan of the paper is as follows. Section two discusses how works councils may influence firms' use of FTCs in Germany, taking into account the legal framework for co-determination. The third section introduces the data. The specification of the equation determining the share of FTC workers and estimation results are contained in section four. Section five looks at the determinants of worker turnover among FTC employees. Conclusions are drawn in the last section.

2. The impact of works councils on the use of fixed-term contracts

What determines the use of FTCs and is the decision to hire fixed-term labour influenced by co-determination? In the following, we distinguish between a direct effect and an indirect effect of works councils. The direct effect stems from works councils' function as workers' interest representation. Works councils may affect the use of FTCs negatively since workers are better off with indefinite-term contracts[3] and works councils act on behalf of employees. This notion is supported by evidence from a representative survey for West German establishments conducted in 1989 (Bielenski / Kohler, 1995, 160). According to this study, 32 per cent of all works councils were strictly against the use of FTCs while a further 44 per cent accepted FTCs only in the case of 'objective reasons'[4]. The indirect effect arises because works councils raise firms' separation costs with respect to regular employees. Thus, they may make workers on permanent contracts more expensive and induce firms to substitute permanent employees by fixed-term labour.

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[3] This would not be the case if FTC workers were compensated for lower job security by higher wages. However, empirical evidence shows that this is not the case. Indeed, FTC workers tend to receive lower pay than comparable permanent workers (see, for example, Hagen, 2002, for Germany and Booth et al., 2002, for Great Britain).

[4] Since the Employment Promotion Act of 1985, employers have been free to hire new employees on FTCs without 'objective reasons' for a duration of up to 18 months. However, an FTC has to be converted into a permanent contract if, on expiry of the contract, the worker is to be retained.

In the following, we discuss the relevance of these two effects from a theoretical point of view. Since both of them are closely connected to works councils' co-determination rights as contained in German labour law, we also provide some institutional detail on the legal competencies of works councils in this section.[5]

2.1 The direct effect: representation of worker interests

To examine the function of works councils as interest representation and their role in influencing firms' decision to use FTCs, we need to distinguish between the interests of different groups of employees. In the first place, we need to consider the interests of FTC workers who wish to have their contract converted into a permanent one. However, while these workers have full voting rights in works council elections, they will almost always be in a minority position within the establishment. Therefore, the works council's stance towards FTCs is more likely to be determined by the interests of permanent workers. Concerning their position, different aspects have to be considered.

First, among permanent employees there may be the fear to by replaced by fixed-term workers due to firms' desire to increase employment flexibility. Workers on indefinite-term contracts may, therefore, wish to restrict the use of FTCs. Employment protection legislation clearly prevents firms from making large-scale reductions in the existing workforce, hiring new workers on the basis of FTCs instead. However, legal employment protection does not provide a guarantee of future employment in the firm. In the case of declining sales and output, firms may make some of their workforce redundant, with the intention to hire FTC workers once the demand for the company's products has recovered. By contrast, if FTCs are not available, it may be efficient for the firm to continue employing the current workforce even during a temporary slump. Therefore, the threat of being dismissed due to a greater use of FTCs may be real, but it should matter only for those workers with least employment security, i.e. those who are most likely to lose their job in a downturn.

Second, however, firms may insulate their permanent workforce from changing demand conditions by employing FTC workers. This may help firms to gain flexibility while, at the same time, maintaining the incentive for permanent workers to invest in firm-specific human capital. In the extreme, if all adjustment is made by changes in the number of FTC workers, job stability

[5] Institutions are described only inasmuch as they relate to our hypotheses. Detailed information on the legal background for FTCs is contained in Boockmann / Hagen (2001). Since our analysis covers the period between 1997 and 1999, we do not take into account the revision of the Works Constitution Act and the new Law on Part-Time and Fixed-Term Employment Contracts. Both came into force in 2001.

among permanent workers is maximised. Therefore, permanent workers may have an interest in the use of some fixed-term labour by the firm.[6]

A similar question relates to the works councils' stance on the duration of fixed-term contracts. Fixed-term employees clearly have an interest in their contracts being extended. However, regular employees could be in favour of more short-term contracts, because the distinction between regular and atypical workers is thus underlined.

Taking these arguments together, the position of works councils towards to the use of FTCs cannot be predicted unambiguously. Another question is whether works councils wield much power over firms' decisions to use FTCs anyway. In Germany, the legal basis for the works council's influence is the Works Constitution Act (Betriebverfassungsgesetz, abbreviated BetrVG). In establishments with at least 20 employees, works councils have to agree to the recruitment of new employees (§ 99 BetrVG). They can refuse to agree if the recruitment leads to dismissals or is otherwise detrimental for current staff. In this case, the employer can appeal to a labour court for approval of the recruitment. Thus, although works councils cannot in all cases prevent the employer from hiring new workers, they can increase the procedural complexity and the costs of hiring.[7] Apart from these general provisions, however, the Works Constitution Act does not provide works councils with a mandate to negotiate with employers over the use of FTCs.[8] In particular, the list of co-determination rights contained in § 87 of the Act does not contain a reference to fixed-term contracts. Neither is there any such provision in other labour laws.

The absence of an explicit right to negotiate on FTCs, however, does not preclude the possibility that management and works council bargain over the issue and conclude formal or informal agreements. It is possible to restrict the use of FTCs in employer-works council agreement (Betriebsvereinbarung) in accordance with § 88 of the Works Constitution Act. Moreover, there may be informal agreements between the works council and management. The study by Bielenski and Kohler (1995) quoted earlier, however, found that only one per cent of all employers stated that employer-works council agreements or collective wage agreements restricted the use of FTC contracts. If anywhere, restrictions on the use of FTCs can be found in large firms (see Dragendorf

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6 This argument is developed in greater depth in the recent paper by Cahuc and Postel-Vinay (2002), who look at the combined impact of FTCs and employment protection on workers' welfare in the framework of a theoretical matching model.

7 Frick (1997), however, finds a positive impact of works councils on hirings.

8 The Law on Part-Time and Fixed-Term Employment Contracts of 2001 introduced the right of the works council to be informed of the number and the proportion of employees with fixed-term contracts (§ 20). However, no right of co-determination concerning the type of contract offered is included in the law.

et al., 1988). Therefore, one would expect that works councils' participation rights have only a limited influence on the use of FTCs.

2.2 The indirect effect: substitution of permanent by fixed-term labour

FTC employment may be profitable because firms can adjust more efficiently to temporary demand fluctuations. In particular, if employers are uncertain about whether a rise in demand is temporary or permanent, they will be reluctant to increase the number of regular workers, relying instead on atypical workers until the economic outlook becomes more certain (Saint-Paul, 1996). Since firing costs are particularly high where works councils are present, works councils may increase firms' demand for FTCs at the expense of regular employment.

Works councils raise firing costs because, according to stipulations of the Works Constitution Act, they must be consulted before an employee can be dismissed. If the works council objects to the dismissal, the worker has a claim to continued employment until the case is settled by a judicial decision or out of court (§ 102 BetrVG).[9] In case of mass dismissal, consultation with the works council is more extensive and the regional employment office (Landesarbeitsamt) must be informed. The employment office can decide that the employer has to wait for up to two months before proceeding with redundancies. Furthermore, firms with at least 20 employees have to negotiate a "social plan" with the works council (§ 112 BetrVG), which includes redundancy payment and payment of re-training measures. Thus, works councils are able to make individual or collective dismissals costly either in terms of time, money or procedural complexity (Hunt, 2000).

The link between firing costs of regular employees and the use of FTC labour is supported by empirical evidence from our earlier study (Boockmann / Hagen, 2001). The increase in the threshold for the application of the Protection Against Dismissal Law from 10 to 20 employees in 1996 provided a basis for a natural experiment. Establishments outside the scope of the law after 1996 had a reduced likelihood of employing FTC workers, while no such change was found for firms in other size categories.

[9] The case that works councils object to a dismissal is the exception rather than the norm (Höland, 1985 as well as Frick / Sadowski, 1995). However, even the threat of an objection by the works council may be sufficient to raise firms' dismissal costs.

3. Data set and descriptive statistics

The empirical analysis is based on three waves of the IAB-Establishment Panel (from 1997 to 1999) for West Germany which contains over 4000 usable interviews in each year.[10] The unit of observation of the data is the establishment, not the company. By 'establishment' we mean *"the local unit in which the activities of a company, that is, the production of goods or services, are actually carried out."* (Kölling, 2000, 293). The population of the panel consists of establishments with at least one employee covered by social security. Therefore, establishments with only self-employed persons (such as farmers, artists or publicists) are excluded. We also exclude non-profit organisations, the government sector, public social security institutions and agricultural enterprises. Financial institutions and insurance companies are also dropped from the data set, since they do not report sales as a measure for their business volume and expectations on future sales are among our independent variables.

In each year, the establishments taking part in the survey are interviewed on the number and structure of their employees as of June 30th. We restrict our descriptive and econometric analysis to establishments in West Germany. East German firms are excluded since the proportion of FTC workers in public programmes is known to be high and we cannot distinguish between participants in public employment programmes (Arbeitsbeschaffungsmaßnahmen) and unsubsidised FTC workers in our data. By contrast, the share of subsidised workers in total FTC employment is less than five per cent in West Germany, as more recent data from the IAB establishment panel shows. Moreover, since non-profit organisations, the government sector and public social security institutions are excluded, subsidised employment should be a minor issue for our data.[11]

The coverage of works councils for the estimation sample is depicted in Table 1. The coverage of works councils is significantly reduced by the definition of our sample. This explains the differences to other studies, such as Addison et al. (2001).[12] Only 3.79 per cent of all establishment with five to 20 employees have works councils. The proportion of workers covered by works councils is 5.1 per cent in these establishments. By contrast, works councils can be found in nearly every establishment with more than 1000 employees.

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10 Due to data confidentiality laws in Germany, it is not possible for researchers outside the Federal Labour Service to access the data directly. For this reason, all data operations were carried out with the help of the IAB-Establishment Panel Data Service at the Federal Labour Service Offices.

11 Most public employment measures are carried out in the public sector and in non-profit organisations.

12 Works councils are more prevalent in the public sector, in financial institutions and insurance companies. If we use the entire sample, the figures are very similar to those reported in Addison et al. (2001).

Since there is no comparison group, the effect of works councils cannot be estimated for large establishments. For this reason, we restrict our sample to establishments with up to 1000 employees. We omit the category of establishments with one to five employees, since the Works Constitution Act does not apply to this group.

Table 1

Coverage of Works Councils by Establishment Size, 1997 – 1999

Establishment Size (number of employees)	Share of Establishments with Works Councils (per cent)	Share of Workers in Establishments with Works Councils (per cent)	Observations
5 – 20	3.79 (0.38)	5.10 (0.49)	2441
21 – 100	28.31 (1.25)	34.53 (1.29)	1939
101 – 299	71.26 (2.25)	72.76 (2.23)	1159
300 – 1000	88.67 (2.39)	89.71 (2.23)	916
1001 –	97.18 (1.90)	97.33 (1.37)	761
total	9.80 (0.37)	44.91 (0.65)	7216

Notes: Weighted data for West Germany. As in the estimation sample, establishments which did not report their sales as revenues (financial institutions, insurance companies, non-profit organisations, the government sector, public social security institutions and agricultural enterprises) were excluded. Standard deviations in parentheses.

Not only does the proportion of establishments with works councils vary with establishment size, but the mandate of works councils also differs. The relevant thresholds are at 21, 101 and 300 employees, respectively (see, for instance, Addison et al., 2000). The most important threshold is between 20 and 21 employees. The works council has a mandate for co-determination with regard to matters relating to the individual employment contract only beyond that level of employment. Similarly to Addison et al. (2001), we therefore restrict our sample to establishments with 21 to 1000 employees. In order to check the sensitivity of the results with respect to establishment size and variations in works councils' legal mandate, we additionally use a sub-sample of establishments with 21 to 100 employees.

Descriptive information on our dependent variables is provided in Table 2. The data source is the same as in Table 1 except that firms with one to five employees are also listed here. Again, it should be kept in mind that the fig-

ures are based on the estimation sample, i.e. establishments such as financial institutions, insurance companies, the agriculture and the public sector are excluded.

Table 2

Fixed-Term Contract Employment by Establishment Size, 1997 – 1999

Establishment Size (number of employees)	Share of Establishments with FTC workers (per cent)	Share of FTC Workers (per cent)	Share of FTC workers in establishments with FTC workers (per cent)
1 – 5	2.46 (0.48)	1.10 (0.24)	43.37 (4.58)
5 – 20	8.84 (0.66)	2.19 (0.23)	22.30 (1.55)
21 – 100	29.81 (1.35)	3.38 (0.54)	10.01 (1.46)
101 – 299	63.07 (2.02)	4.60 (0.63)	7.05 (0.91)
300 – 1000	75.37 (2.92)	4.36 (0.29)	5.76 (0.29)
1001 –	83.34 (2.65)	3.97 (0.21)	4.63 (0.22)
total	9.15 (0.41)	3.25 (0.19)	6.94 (0.32)

Notes: Weighted data for West Germany. As in the estimation sample, establishments which did not report their sales as revenues (financial institutions, insurance companies, non-profit organisations, the government sector, public social security institutions and agricultural enterprises) were excluded. Standard deviations in parentheses.

While the share of establishments employing at least one FTC worker increases trivially with establishment size (column 1), there is no clear correlation between size and the share of FTC employment in total employment (column 2). This is a consequence of the relation between establishment size and FTCs for those establishments employing at least one FTC worker (column 3). Among these establishments, the share of FTC workers declines with establishment size, even for large establishments where indivisibility does not affect the results. This finding suggests that the decision whether to employ FTC workers at all may be determined differently from the decision of how many FTC workers to employ.

4. The demand for labour on fixed-term contracts: empirical analysis

4.1 Specification and hypotheses

In the following, we use the probability of employing at least one FTC worker as well as the share of FTC workers in total employment as our two dependent variables. To deal with the first dependent variable, we use a probit model. Regarding the second, approximately 45 percent of all establishments in our sample (with 21 up to 1000 employees) do not employ any FTC workers. The dependent variable is thus censored at zero FTC employees. In order to obtain consistent and unbiased estimations, we estimate a tobit model and the sample selection introduced by Heckman (1979), also called the type 2 tobit model.[13]

The tobit model imposes the restriction that the decision to employ at least one FTC worker is determined by the same stochastic process as the decision of how many FTC workers to employ. In our case, not only are there reasons both for a positive and a negative impact of works councils on the use of FTCs, but the impact may also differ for the likelihood and the share of FTC employment. Therefore, it would not be reasonable to impose the restriction implicit in the tobit model without comparing the results to a more general model.

The sample selection model consists of two stages: In the first stage, the probability of employing at least one FTC worker is estimated using a probit model. In the second stage, the share of FTC workers is estimated on the sample of establishments with at least one FTC worker, including the first-stage residual (the inverse Mills ratio) as an additional regressor. For identification one needs at least one variable in the first stage which is insignificant in the second stage and can therefore be excluded.[14] There is a number of variables which fulfil this condition in our dataset.

The panel character of the data allows us to control for unobserved firm-specific heterogeneity in the probit and the tobit estimations. To this purpose, we use the random effects probit and the random effects tobit models of Butler / Moffitt (1982). A potential drawback of the random effects probit and tobit models is that they are calculated using Gauss-Hermite quadrature as an approximation for the high-dimension integral that is part of the likelihood

[13] One might object that the ratio is restricted to values between 0 and 100, and therefore use a logit transformation. However, since there are many observations at the lower boundary, it is more appropriate to treat this as a genuine problem of censoring. Note that there are no establishments employing only fixed-term workers, hence we can neglect the upper boundary for the dependent variable.

[14] The model can still be estimated in the absence of exclusion restrictions through identification by functional form. However, identification of the model then rests entirely on distributional assumptions.

function. This requires the integrated function to be well-approximated by a polynomial. The approximation is appropriate if changing the number of quadrature points does not affect the results. Our findings seem to be robust to any such changes.[15]

We now turn to the explanatory variables. As mentioned above, uncertainty about future demand may be a reason for firms to hire FTC workers instead of permanent workers. As an indicator for uncertainty, we use information generated by a question on the development of sales in the current year. Establishments can choose between the following answers: "sales will be approximately constant", "sales will rather increase", "sales will rather decrease", and "I do not know yet". We interpret the last option as uncertainty and code a dummy variable accordingly. Furthermore, we include the expected percentage change in sales (as compared to the previous year) as an additional continuous explanatory variable.

In order to control for the industrial relations practices in the establishment, we use dummy variables indicating whether the establishment is bound to an industry-level or a firm-level collective wage agreement. Collective wage agreements sometimes include regulations which may prevent employers from hiring on the basis of FTCs. Furthermore, they can restrict the duration of FTCs (Schaub, 1997). Although provisions on FTCs can be found only relatively infrequently in collective agreements, there is some evidence that the duration of FTCs is reduced by collective wage agreements (Walwei, 1990).

In the IAB survey, establishments are asked whether they expect problems due to sickness or maternity leave within the next two years. We include the answers to this question as two further dummy variables. This information is important because illness or other absences of employees (due to child care etc.) are legally accepted as 'objective' reasons for employing FTC workers in Germany.[16]

In order to control for the regional labour market situation, we include the unemployment rates of the federal state in which the establishment is located. We expect the unemployment rate to have a positive effect on the use of FTC workers since high unemployment may force workers to accept job offers on the basis of FTCs instead of permanent contracts.[17]

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15 Recently, several fixed effects estimators for selection models have been proposed in order to deal with unobserved heterogeneity (for a survey, see Dustmann / Rochina-Barrachina, 2000). Unfortunately, there is insufficient variation over time in the works councils and the FTC variable to allow for the use of fixed effects estimators in our case.

16 For 'objective reasons', see footnote 4. In a theoretical model, Abraham (1988) formalises the notion that the stochastic absence time from work is a reason both for overstaffing and employing temporary workers from temporary help services.

17 Alternatively, we included dummies for federal states. The results for the other variables did not differ according to which measure was used.

Among the characteristics of the workforce included is the share of skilled workers in the total number of employees, where unskilled manual workers and white-collar workers without vocational training are aggregated into the unskilled category. We also use the share of women in the workforce as an explanatory variable.

Further variables capture the effect of the technology used in the establishment and the effect of investment. The adoption of new technologies often requires further training. Since employers' and employees' incentives to engage in job-specific training increase with the expected duration of the employment contract, a firm may not hire FTC workers for tasks linked with new technologies. One would, therefore, expect the probability of employing FTC workers to be lower in companies investing in new technologies (Maurin, 2000). Apart from a dummy variable for investment into information and communication technologies (ICT) in the previous year, we include indicators for the following kinds of investments: production facilities and equipment, real estate, and means of travel and transportation.[18]

Given that the use of FTCs, the existence of works councils and establishment size are all correlated, it is crucial to control for the effect of establishment size. In the estimations presented here, we include polynomials of total employment. The results do not change if dummy variables for firm size categories are used instead.

4.2 Estimation results

Estimation results for establishments with between 21 and 1000 employees are displayed in Table 3. In order to check the sensitivity of the results, we estimate the same models for establishments with 21 up to 100 employees (Table 4).

[18] Variables that were used but are not included in the preferred specification include managers' own assessment regarding the state of their capital equipment as well as the total volume of investments. These variables were found to be insignificant in all specifications.

Table 3: **Determinants of Fixed-Term Contract Employment in West German Establishments with 21 – 1000 employees**

	Random-Effects Probit[1]		Random-Effects Tobit [1]		Sample Selection Model[1, 2]			
					Share of FTCs (2nd stage)		Pooled Probit (1st Stage)	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Works Council	0.549	5.26	0.014	2.03	–0.021	–2.59	0.377	6.23
Wage Agreement: firm level	–0.176	–1.23	–0.002	–0.28	0.017	2.04	–0.073	–0.78
industry level	–0.304	–2.78	–0.013	–1.78	0.003	0.37	–0.180	–2.68
Uncertain Sales Expectations	0.138	0.82	0.006	0.65	0.003	0.26	–0.104	0.92
Expected Sales Increase (in per cent)	0.018	3.37	0.000	2.79	0.000	0.68	0.013	3.54
Expected Sales Decrease (in per cent)	–0.009	–1.70	0.000	–0.33	0.001	2.54	–0.005	–1.36
Share of unskilled	–0.144	–0.97	0.037	3.89	0.070	8.52	–0.108	–1.21
Share of women	0.059	0.29	0.019	1.32		–	0.020	0.17
Problems due to maternity leave $(t-1)$	0.216	1.43	–0.007	–0.62		–	0.179	2.12
Problems due due to sickness $(t-1)$	0.095	0.85	0.015	1.73		–	0.059	0.95
Investment $(t-1)$ *in*								
Real estate	0.147	1.62	0.004	0.74		–	0.065	1.07
Information and communication	0.106	1.29	0.004	0.76		–	0.122	2.24
Production facilities and equipment	0.159	1.94	0.010	2.12		–	0.161	2.92
Travel and transportation	–0.074	–0.92	0.000	–0.08		–	–0.071	–1.34
Total Employment	0.020	7.34	0.001	5.38	0.000	0.13	0.013	8.34
(Total Employment)^2 * 10^{-3}	–0.060	–4.49	–0.003	–3.51	0.000	–0.26	–0.038	–4.93
(Total Employment)^3 * 10^{-6}	74.743	3.25	3.771	2.65			48.208	3.57
(Total Employment)^4 * 10^{-15}	–32.000	–2.55	–1.649	–2.16			–21.200	–2.82
Regional Unemployment Rate	0.040	2.61	0.002	1.73			0.031	3.54
Constant	–2.359	–8.08	–0.157	–7.83	0.013	0.58	–1.682	–10.13
Inverse mills ratio					0.018	1.13		
Std. error of random effects (Std. error)	1.158	0.084	0.101	0.003				
Number of observations	3,527		3,527		1,941		3,527	
Number of establishments	1,923		1,923				1,923	
LR Test of joint significance (p-value)	$\chi^2(32)$ =349.36 (0.000)		$\chi^2(32)$ =321.31 (0.000)		$\chi^2(53)$ =683.55 (0.000)			

Notes: [1] Industry and Wave dummies are included but not reported. [2] Federal state dummies are included but not reported.

Table 4: **Determinants of Fixed-Term Contract Employment in West German Establishments with 21 – 100 employees**

	Random-Effects Probit[1]		Random-Effects Tobit [1]		Sample Selection Model[1, 2]			
					Share of FTCs (2nd stage)		Pooled Probit (1st Stage)	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Works Council	0.455	3.67	0.023	1.76	–0.042	–2.13	0.357	4.68
Wage Agreement: firm level	–0.204	–1.04	–0.002	–0.10	0.019	0.85	–0.123	–0.91
industry level	–0.271	–2.04	–0.022	–1.68	0.009	0.56	–0.177	–2.07
Uncertain Sales Expectations	0.039	0.17	0.008	0.37	0.025	0.95	–0.023	–0.14
Expected Sales Increase (in per cent)	0.024	3.17	0.001	1.92	0.000	–1.19	0.018	3.35
Expected Sales Decrease (in per cent)	–0.010	–1.44	0.000	0.62	0.004	4.04	–0.006	–1.12
Share o f unskilled	0.219	1.11	0.047	2.38	0.076	3.76	0.135	1.08
Share of women	–0.117	–0.44	0.004	0.15		–	–0.125	–0.78
Problems due to maternity leave $(t-1)$	–0.028	–0.14	-0.013	–0.56		–	0.033	0.28
Problems due due to sickness $(t-1)$	0.246	1.54	0.017	0.99		–	0.157	1.66
Investment $(t-1)$ *in*								
Real estate	0.126	0.94	0.018	1.46		–	0.042	0.46
Information and communication	0.079	0.74	0.007	0.73		–	0.078	1.05
Production facilities and equipment	0.038	0.36	0.007	0.71		–	0.047	0.64
Travel and transportation	–0.025	–0.23	–0.001	–0.13		–	–0.050	–0.67
Total Employment	–0.024	–0.45	–0.004	–0.68	–0.002	–1.48	–0.003	–0.09
(Total Employment)^2 * 10^{-3}	0.869	0.87	0.105	1.05	0.016	1.32	0.304	0.48
(Total Employment)^3 * 10^{-9}	–5.655	–0.99	–0.656	–1.15			–2.120	–0.58
Regional Unemployment Rate	0.051	2.49	0.006	2.56			0.035	2.86
Constant	–2.162	–2.38	–0.231	–2.44	0.149	1.33	–1.682	–2.95
Inverse mills ratio					–0.066	–1.08		
Std. error of random effects (Std. error)	1.074	0.111	0.136	0.007				
Number of observations	1,697		1,697		564		1,697	
Number of establishments	926		926				926	
LR Test of joint significance (*p*-value)	$\chi^2(31)$ =101.73 (0.000)		$\chi^2(31)$ =118.29 (0.000)		$\chi^2(53)$ =210.55 (0.000)			

Notes: [1] Industry and Wave Dummies are included but not reportet. [2] Federal state dummies are included but not reported.

The first column presents the results for the random effects probit model for the determinants of employing at least one FTC worker. Column two shows the results for the random effects tobit model for the share of FTC workers in the stock of employment. Results for the second stage of the sample selection model are contained in column three, while the first-stage results are shown in the last column.[19] Since the scaling parameter differs between estimators, only the sign and the *t*-values of the coefficients can be compared across all three models.

The most important result is that the existence of works councils increases the probability of employing at least one FTC worker (column 1). The estimated coefficient is highly significant in both samples. This result carries over to the tobit models for the share of FTC workers. However, the coefficient is only significant at the 10 per cent level for establishments with 21 to 100 employees. By contrast, the presence of a works council enters strongly negatively in the share equation of the sample selection model. This result suggests that, while the existence of a works council increases the likelihood of employing at least one FTC worker, it decreases the share of FTC workers in total employment in establishments with at least one FTC worker. Clearly, this indicates that the tobit assumption is violated. The significantly positive works council effect in the tobit estimation is most likely driven by the probit part of the likelihood function.[20]

How can these results be interpreted? A possible explanation is that, on the one hand, works councils raise firing costs of workers on permanent contracts,

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19 We used the two-step Heckman procedure instead of maximum likelihood estimation since it was more stable computationally. The variance-covariance matrix is corrected accordingly. In order to check sensitivity of the results of the Heckman sample selection model with regard to the joint normality assumption, we also used Olsen's (1980) sample selection model for estimation. Since the results differ only little, we conclude that the assumptions of the Heckman model do not influence the results to a great extent.

20 A sensitive issue is the possible endogeneity of the dummy variable for the existence of works councils. Since endogeneity would result in inconsistent estimation results, Fitzroy / Kraft (1987) apply an instrumental variable approach for the estimation of productivity effects of works councils, while Addison et al. (2002) use statistical matching methods. In our case, it is conceivable that FTC workers are less interested in co-determination than permanent workers. This would make the existence of works councils in firms with a high share of FTC workers less likely. This form of endogeneity would exert a downwards bias on the estimated impact of works councils on FTC employment. We addressed the endogeneity problem by performing probit estimations for the existence of a works council. The share of FTC workers was used as an explanatory variable in the estimations. It turned out that this variable was insignificant in all specifications used (results are available on request from the authors). We conclude that endogeneity does not influence our results. Indeed, it is plausible that the existence of a works council is determined by long-term factors, whereas the hiring of FTC workers is more of a short-term decision. Thus, short-run changes in the number of FTC workers have no long-lasting effects on co-determination.

which increases firms' likelihood of hiring FTC workers. On the other hand, works councils in establishments employing FTC workers may worry that their share does not become too large. Although they may not principally be against the use of FTC workers, works councils may nevertheless use their influence in order for these contracts to remain the exception rather than the rule. In this way, the majority of workers continue to enjoy a great degree of employment protection.

Another interesting result is that the existence of a collective wage agreement at the industry level (but not at the firm level) reduces the probability of observing FTC workers, although it does not influence the share of FTC workers. Apparently, unions prevent firms from using FTC workers. However, since we did not find this effect in an analysis on the basis of the same data for earlier periods (Boockmann / Hagen, 2001), this result should perhaps be interpreted with caution.[21]

Positive expectations concerning the future development of sales enter significantly positively in the probit and tobit specifications, although they are not significant in the second step of the sample selection model. More surprisingly perhaps, negative expectations tend to have a negative effect on the dependent variable (but are not significant at the five per cent level) in probit and tobit estimation, but have a significantly positive impact on the share of FTC workers in the sample selection model. The last result can be explained by the fact that firms with negative expectations about future demand conditions meet their replacement requirements by hiring of FTC workers instead of regular employees. Furthermore, these firms will hesitate to transfer workers from FTCs to permanent contracts. Conversely, firms expecting to grow may prefer to hire regular workers or to transfer FTCs into permanent contracts. However, they are likely to hire *some* FTC workers in case the positive development turns out to be transitory, which may explain that the likelihood of FTC employment increases with expected sales. The dummy variable indicating uncertainty over future demand is not significantly different from zero.

In the probit and the tobit estimation, the regional unemployment rate has a significantly positive effect, while this variable was not found to be significant in the share equation of the sample selection model and is, therefore, omitted. The positive impact may, on the one hand, be interpreted as a supply-side effect. Workers in regions with unfavourable labour market conditions may be forced to accept FTCs. On the other hand, firms may also offer fewer jobs on permanent contracts in a region with high unemployment rates, since the economic prospects in this region are not favourable.

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[21] Using a survey of service sector firms, Kaiser / Pfeiffer (2001) found that the application of a collective wage agreement actually *increased* the use of FTCs.

The indicator variables for problems due to maternity leave or sickness tend to influence the use of FTCs positively, but they are often insignificant and sensitive to the definition of the sample. Similarly, coefficients for the dummy variables indicating different kinds of investments are positive but lack robustness. From the probit and the tobit models, there is some evidence that investment in production facilities and equipment raises the probability and the share of FTCs, but this result is not confirmed in the sub-sample with smaller establishments. Finally, ICT investment has no effect on the demand for FTC workers.

5. The effect of works councils on the flow of FTC workers

In this section, we investigate whether the presence of a works council has a positive impact on measures of employment stability among fixed-term contract workers. There are two motivations for this investigation. First, the results presented in the last section may be either due to the impact of works councils on the number of FTC workers hired or due to their impact on contract duration. For instance, the increased likelihood of FTC workers in establishments with works councils may result from a higher number of hirings or from longer average FTC durations. Conversely, the decreased share of FTC workers in establishments with works councils could be due to the fact that works councils do not influence hiring behaviour but, in line with dual labour market theory, reduce the duration of FTC contracts. Moreover, if works councils promote the use of FTCs as an adjustment instrument along the lines discussed in section two, works councils will have a positive effect on the turnover of FTC workers while their effect on the turnover of permanent workers will be negative. Second, the question of employment stability is interesting in its own right, because results from other studies suggest that works councils tend to increase employment stability, which is in line with the interest representation argument.[22]

In the following, our two dependent variables are the turnover and the rotation rates of fixed-term employment. Turnover is the sum of hirings and separations due to contract expiry. Employees who take up unlimited employment with the same employer are not included in the definition of turnover. The rotation rate is the part of the turnover rate not associated with net changes in the level of employment. The reason for using the rotation rate is that the determinants of employment creation and reduction, on one hand, and simultaneous hiring and firing, on the other, are likely to differ.

[22] Frick (1996, 1997) finds that the existence of works councils reduces quits but leaves hirings unaffected. Dilger (1999) reports a negative effect of works councils on turnover. In the study by Addison et al. (2001), the effect on hirings, separations and turnover is also negative, but loses its significance when only establishments with less than 100 employees are looked at.

To introduce these concepts more formally, let hiring and separation rates of FTC workers be defined as

$$HR_{it} = \frac{H_{it}}{N_{it}}\,,\quad SR_{it} = \frac{S_{it}}{N_{it}}\,,$$

where H_{it} is the number of new FTC workers at time t in establishment i, S_{it} is the number of workers who leave the firm due to the expiration of their contract, and N_{it} is the stock of FTC workers. The turnover rate is simply the sum of the hiring and separation rates:

$$TR_{it} = HR_{it} + SR_{it}\ .$$

To derive the rotation rate, we deduct job creation and job destruction from the turnover rate. In line with Serrano (1998), we assume that job creation and job destruction can be measured as the net increase or decrease in employment in the establishment. The rotation rate is then given by

$$RR_{it} = TR_{it} - GR_{it} = HR_{it} + SR_{it} - |HR_{it} - SR_{it}|\ .^{23}$$

In the following, we regress turnover and rotation rates on roughly the same set of covariates as the share and the likelihood of FTC labour in the last section. Again, the presence of a works council is the main variable of interest.

In estimating turnover and rotation rates, we encounter two problems. The first is the selection of establishments into the groups of establishments with fixed-term contracts, which suggests the use of a Heckman-type selection model on the whole sample, with a selection equation determining the use of FTC workers as in the last section and an equation for the turnover or rotation rate as a second stage. The second problem is that some establishments using FTC workers nevertheless have zero turnover or rotation rates, which suggests the use of a tobit model at the second stage.

Maximum likelihood estimation of a model which contains both censoring effects proved to be infeasible due to the lack of concavity of the likelihood function. Therefore, we first estimated a Heckman model with a linear outcome equation, neglecting the censoring problem at the second stage. The Heckman procedure gave no evidence of any correlation between the error terms of the selection and the outcome equation.[24] We, therefore, perform

[23] There is a clear analytical link between the rotation rate and the churning rate used as the dependent variable in Beckmann/Bellmann (2002). It can be shown that the churning rate is simply the rotation rate divided by the turnover rate (see Boockmann/Hagen, 2002).

[24] The coefficients of correlation are 0.176 in the rotation rate model and –0.124 in the turnover rate model. The inverse Mills ratio had t-statistics of 0.77 and 0.54, respectively.

tobit estimation on the sub-sample of establishments using FTC workers only.

Results are contained in Table 5. The works councils variable is not significant in any of the equations. Furthermore, it has the 'wrong' sign if works councils are thought to increase FTC workers' employment stability. Therefore, the results for the works council influence reported in the last section are likely to be produced by differences in the number of FTC workers, and not by differences in the duration of FTCs.

Table 5

Tobit Estimation of Turnover and Rotation Rates

	Turnover Rate		Rotation Rate	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Works council	0.296	0.73	0.011	0.06
Wage agreement: firm level	0.399	0.73	–0.233	–1.01
industry level	–0.417	–0.97	–0.336	–1.81
Uncertain sales expectations	–0.065	–0.11	0.090	0.36
Expected increase in sales (in per cent)	0.003	0.37	0.002	0.52
Expected decrease in sales (in per cent)	–0.036	–1.61	–0.018	–1.61
Share of unskilled	1.069	2.02	0.341	1.50
Investment $(t-1)$ *in*				
Real estate	0.024	0.07	–0.122	–0.88
Information and communication	–0.154	–0.47	0.116	0.80
Production facilities and equipment	0.782	2.23	0.325	2.05
Travel and transportation	–0.299	–1.00	–0.141	–1.10
Total employment	0.001	0.60	0.005	5.70
$(\text{Total employment})^2 * 10^{-3}$	0.002	1.01	-0.004	–3.74
Regional unemployment rate	–0.052	–0.98	0.003	0.11
Constant	–1.398	–1.51	–2.256	–5.41
Number of observations	1552		1552	
Uncensored observations	1036		398	
Number of establishments	794		794	
LR Test of joint significance (*p*-value)	68.80 (0.000)		160.40 (0.000)	

Notes: Industry and Wave Dummies are included but not reported.

Among the other variables, the share of unskilled workers influences the turnover rate significantly positively. This indicates that low-skilled workers tend to have contracts with shorter durations. The quadratic expression for establishment size is also significant in both equations (*F*-statistics are 32.58

in the rotation equation and 13.08 in the turnover equation). The effect is positive for all establishments in the turnover equation and positive for establishments with more than 750 employees in the rotation equation. The finding that larger establishments have FTCs with shorter duration is perhaps surprising in the light of the evidence for all workers (Addison et al. 2001). One would rather expect contracts in large establishments to have longer durations because of the use of internal labour markets. In both equations, investments into production equipment are positively associated with turnover and rotation. This finding, which is similar to a result found by Beckmann / Bellmann (2002) for all employees, suggests that employment stability decreases as a consequence of changes in the production process. However, no similar effect is found for investment into information and communication technology. The other variables do not significantly contribute to the explanation of turnover or rotation.

6. Conclusions

Theoretical reasoning shows that the effect of works councils on the demand for FTCs (or other forms of flexible employment) is ambiguous. This stems from the fact that permanent workers, who cast the majority of votes in works council elections, have different interests with regard to FTCs. On one hand, the may fear to be, *à la longue,* replaced by FTC workers. On the other, the use of FTC workers could lead to a segmentation of employment which actually increases permanent workers' employment security.

The fact that the theoretical expectation for the works council's impact is ambiguous is reflected in the estimation results. While the likelihood of using FTC work is influenced positively by the presence of a works council, the share of FTC workers is lower in establishments with a works council than in those without. This can be explained by permanent workers' desire that FTC employment, while being tolerated or even welcomed as a means to enhance employment flexibility without reducing job security, remains the exception rather than the rule. Permanent workers have an interest in some FTC labour being used by the establishment, because this insulates them from changing demand conditions. However, they are opposed to a substitution of permanent by fixed-term labour. The former effect dominates at low levels of FTC employment, while the latter effect dominates if the FTC share is high, because here the regular workforce is largely protected against displacement.

Regression results for turnover and rotation rates suggest that works councils do not influence the duration of FTCs. This means that the observed differences in the likelihood and share of FTC employment are produced by differences in the number of FTC workers, not by differences in the duration of contracts.

Further research may distinguish between different kinds of works councils. For instance, works councils in establishments with and without collective wage agreements may differ in their stance towards FTCs. Another issue is the effect of works councils on the transfer of FTC workers into permanent employment. Again, the question is whether works councils act in the interest of FTC workers or whether they strengthen labour market segmentation. Given that this variable has only recently been included into the questionnaire of the IAB establishment panel, this issue could not be addressed in this paper.

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