



IAAEU

Institut für Arbeitsrecht
und Arbeitsbeziehungen
in der Europäischen Union

**IAAEU Discussion Paper Series in Economics
No. 01/2016**

**Paid Vacation Use:
The Role of Works Councils**

Laszlo Goerke, Sabrina Jeworrek

February 2016

Institute for Labour Law and Industrial Relations in the
European Union (IAAEU)
54296 Trier
www.iaaeu.de

Paid Vacation Use: The Role of Works Councils*

Laszlo Goerke

E-mail: goerke(at)iaaeu.de

IAAEU – Trier University ⁺, IZA, Bonn and CESifo, München

Sabrina Jeworrek

E-mail: jeworrek(at)iaaeu.de

IAAEU – Trier University ⁺

⁺ Institute for Labour Law and Industrial Relations in the European Union, Campus II
D – 54286 Trier, Germany

February 2016

Abstract

We investigate the relationship between co-determination at the plant level and paid vacation in Germany. From a legal perspective, works councils have no impact on vacation entitlements, but they can affect their use. Employing data from the German Socio-Economic Panel (SOEP), we find that male employees who work in an establishment, in which a works council exists, take almost two additional days of paid vacation annually, relative to employees in an establishment without such institution. The effect for females is much smaller, if discernible at all. The data suggests that this gender gap might be due to the fact that women exploit vacation entitlements more comprehensively than men already in the absence of a works council.

JEL Classifications: J 22, J 32, J 33, J 53, M 54

Keywords: Gender Difference, German Socio-Economic Panel (SOEP), Paid Vacation, Works Council

* We are grateful for helpful comments by participants of the 4th SOLE EALE World Conference, a seminar in Trier and the annual meeting of the Committee for Population Economics of the Verein für Socialpolitik in Nürnberg.

1 Introduction

In many industrialised countries, employees are legally entitled to four or more weeks of paid vacation annually. The actual number of vacation days taken usually exceeds this legal minimum (Ray and Schmitt 2007, Ray et al. 2013). Therefore, the total duration of paid vacation may amount to up to ten percent of total working time. Especially psychologists argue that vacation time is important to build new resources by recovering from work demands and empirical evidence indicates that such a recovery is associated with less health complaints and higher subjective well-being after returning to work (e.g. Westman and Etzion 2001, Fritz and Sonnentag 2006, de Bloom et al. 2011). Nonetheless, the determinants of paid vacation have not found much attention. So far, analyses of vacation use have focused on individual-specific and job-related correlates, while institutional features have figured less prominently. In this paper, we put a particular labour market institution at centre stage which substantially affects industrial relations in Germany: non-union employee representation at the workplace. More specifically, we analyse the relationship between works councils and the number of vacation days used.

The presence of a works council is correlated with various outcomes affecting an employee's income or working conditions in Germany. Wages and employment stability, for example, are higher in plants with a works council. Moreover, the remuneration structure and working time arrangements differ for establishments in which a works council exists, in comparison to plants without such an institution. In cases such as the regulation of working time, the relevant law, the Works Constitution Act, explicitly grants works councils co-determination rights. If there is, however, collective bargaining between a trade union and employers on an issue, the law generally rules out negotiations between works councils and the employer about this subject. While vacation entitlements in excess of the legal minimum are mostly dealt with in collective negotiations and should, therefore, not be influenced by works councils, the use of vacation days is often decided upon at the plant level. Therefore, works councils may be expected to affect the actual number of days of vacation taken by an employee.

In order to investigate the relationship between the presence of a works council and vacation, we use data from the German Socio-Economic Panel (SOEP) for 1999 to 2011. This is, to the best of our knowledge, the only panel data set with information on both relevant variables. During the period under consideration, data on vacation is available for the years 1999, 2004, and 2009, while a question on the presence of a works council has been included into questionnaires in 2001, 2006, and 2011. Therefore, our initial task is to impute the

information on works councils for the years for which vacation data is available. Applying an OLS-estimator to the imputed data, we show that employees who work in a plant in which there is a works council take more than one additional day of paid vacation annually, relative to comparable employees who work in observationally equivalent plants without such an institution. This works council vacation effect can also be observed when we employ alternative dependent variables. Similarly, our findings are unaffected when using a Poisson model to cater for the fact that our main dependent variable is a count variable or when utilising various matching models to allow for the possibility of a selection bias. When analysing the relationship between the existence of a works council and vacation use in more depth, we find a positive works council vacation differential for male employees also across various regional- and sector-specific subgroups of up to two days. In contrast, there generally is no effect for female employees. Our data suggests that this gender gap arises because women exploit their vacation entitlements to a significantly larger extent than men do. Hence, there is inherently less scope for a works council effect. When looking for the causes of the vacation effect, we find no evidence that it is due to a strict formalisation of working time arrangements, higher perceived job security in plants in which there is a works council or an income effect induced by a works council.

The estimated gain for male employees from co-determination at the plant level is economically relevant, as the subsequent back-of-the envelope calculation indicates. Assuming two hundred working days per year, a works council differential of two days is tantamount to a reduction in working time by 1% or, alternatively, a wage increase by about the same magnitude. To put this number into perspective, it may be noted that Addison et al. (2010) find a direct wage effect of works councils of 4.5% for male employees. Accordingly, the monetary equivalent of the works council vacation differential equals about 20% of the direct wage gain from plant-level co-determination.

The further paper develops as follows. In the next section, we survey the literature. Section 3 provides institutional background information relating to paid vacation and works councils. Section 4 outlines the data and the empirical strategy. In Section 5, we initially present descriptive evidence and findings for regression analyses for the entire sample and various subgroups. Subsequently, we focus on gender differences and analyse potential causes for the works council vacation nexus. Section 6 summarises.

2 Review of the Literature

Our investigation is mainly related to two strands of literature, namely contributions which analyse the relationship between works councils and various facets of employment relations, and analyses of vacation use.

Following the seminal contribution by Freeman and Lazear (1995), works councils have often been viewed as institutions which help to create and/ or share rents. Since there are a multitude of indicators of rent-sharing and rent-creating activities, a complete survey of contributions is a daunting task and clearly beyond the scope of this paper.¹ Instead, we subsequently highlight some investigations which focus on employee-related outcomes and, hence, constitute evidence with respect to rent-sharing.

First, wages are notably higher in establishments in which a works council exists, relative to comparable plants without such an institution (cf. Addison et al. 2001, Addison et al. 2010), although the simultaneous applicability of a collective bargaining agreement can affect this outcome (Hübler and Jirjahn 2003). Moreover, the wage effect may no longer be observable if a change in council status is considered (Kraft and Lang 2008, Grund and Schmitt 2013).

Second, job stability is higher in establishments with a works council. Addison et al. (2001) and Frick and Möller (2003), for example, find that works councils are associated with a reduction in labour turnover. Kraft and Lang (2008) also observe such an impact, which can again not be discerned once unobservable heterogeneity of establishments is accounted for. Related, Hirsch et al. (2010) show that works councils are associated with lower separation rates, particularly for male employees.

Third, there is a higher probability of family-friendly practices at the workplace, such as flexible working time arrangements and childcare, if employees are represented by a works council (cf. Beblo and Wolf 2004, Heywood and Jirjahn 2009). Heywood and Jirjahn (2009) furthermore find that the impact of the works council will be larger if the share of female employees increases. Looking at other working time arrangements, it has, for example, been observed that works councils and the existence of shift work are correlated positively (Jirjahn 2008), while there is no association with overtime (Jirjahn 2008, Schank and Schnabel 2004).²

Turning to the second branch of relevant contributions, the impact and correlates of paid vacation have primarily been looked at for Anglo-Saxon countries. Starting with the United

¹ See Addison (2009) and Jirjahn (2011; in German) for extensive surveys.

² Kraft and Lang (2008) diagnose a negative relationship between the existence of a works council and overtime but, again, cannot find evidence that this correlation is actually due to the introduction of the council.

States, Green and Potepan (1988) employ data from the Panel Study of Income Dynamics (PSID) and observe vacation to rise with tenure. Altonji and Usui (2007) also use PSID data and investigate the impact of vacation days on various indicators of working time. Moreover, they establish a positive correlation between vacation entitlements and the number of vacation days used. Additionally, Altonji and Usui (2007) show that the number of vacation days taken is higher, *inter alia*, for females, more educated people and that it rises with tenure. Maume (2006) utilises the National Study of the Changing Workforce. He finds that vacation entitlements and days used rise with education and tenure. Females use more vacation days than males and their number rises with firm size for females, but does not vary with education. Fasih (2014) conceptually follows the approach by Altonji and Usui's (2007) and presents findings for Canada on the basis of the Workplace and Employee Survey. Vacation entitlements and vacation days used are higher for married respondents and full-time employees, inversely u-shaped in age and their number rises with tenure, education and firm size. Moreover, females have more vacation days and there is a positive relationship with entitlements. Shi and Skuterud (2015) use the Canadian Labour Force Survey and observe a positive correlation between tenure and the probability of being absent in a reference week due to vacation. Turning to Great Britain, Bryan (2006) investigates entitlements to paid vacation employing data from the Quarterly Labour Force Survey. He finds entitlements to be inversely u-shaped in age and tenure, to rise in educational attainments, to be higher for married respondents, but not to vary with gender.³ Moving further around the globe, Wooden and Warren (2008) utilise the Household, Income and Labour Dynamics in Australia data set and show that respondents do not completely consume their vacation entitlements. Moreover, hours of work are associated positively with the number of vacation days taken. Finally, Ohtake (2003) finds vacation days to rise with firm size and vacation entitlements in a firm-level data set for Japan.

With respect to Germany, Saborowski (2005) and Schnitzlein (2012) study the difference between entitlements and vacation days used, employing data from the German Socio-Economic Panel (SOEP). Goerke et al. (2015) also utilise the SOEP, exploiting observations on vacation days taken from 1985 to 2009. Their focus is on the impact of an individual's trade union membership. In neither of these studies, works councils play a role.

The relationship between employee representation and vacation has already been looked at for other countries. There is, for example, evidence that individuals covered by collective

³ On the basis of the United Kingdom time use survey, Saborowski (2005) analyses the under-utilisation of vacation entitlements, i.e. the difference between entitlements and days of vacation actually taken.

bargaining agreements enjoy longer vacations in the United States (Buckley 1989, Buchmueller et al. 2004) and Japan (Ohtake 2003), while the information for Canada is contradictory (cf. Fasih 2014, Shi and Skuterud 2015). Moreover, coverage and union recognition are associated with higher holiday entitlements in Great Britain (Green 1997, Bryan 2006) and Canada (Fasih 2014). It should be emphasised, though, that the findings with respect to vacation days and collective bargaining coverage for other countries cannot simply be extended to Germany. First, the industrial relation system in Germany differs fundamentally from those in Anglo-Saxon countries or Japan. Second, and more importantly, works councils do not constitute the German equivalent to firm-specific trade unions, since they have substantially different rights and obligations. Therefore, the impact of works councils on vacation use deserves closer scrutiny.

3 Institutional Background

3.1 Paid Vacation

In Germany, the Federal Vacation Law (*Bundesurlaubsgesetz*) establishes an entitlement to paid vacation of 24 days per annum for dependent employees, on the basis of a six-day work week (§ 3). Individual or collective agreements often extend these entitlements to 30 or even more days, generally presuming five working days per week (WSI 2015). Since bargaining coverage in the private sector in Germany in 2010 was more than 60%, while labour contracts of a further 20% of the workforce reflected the content of collective agreements (Ellguth and Kohaut 2011), vacation entitlements are determined by collective negotiations in most cases.

The entire vacation entitlement can only be used once the contract has lasted for six or more months (Federal Vacation Law, § 4), that is, after the common probation period has expired. Within the first six month of an employment relationship, the right to take paid vacation exists on a pro rata basis. Since entitlements are based on calendar years, employees can generally use remaining vacation entitlements in the first months of the subsequent year (§ 7). Moreover, periods of illness, which occur during vacations and which have been certified by a doctor, prolong the vacation entitlement. Note, finally, that the law rules out the possibility to substitute additional wage payments for vacation days not taken, unless the employment relationship is terminated.

The exact dates of paid leave have to be agreed upon between the employee and the employer. The Federal Vacation Law, moreover, states that the timing of vacation has to take into

account the preferences of the employee, unless they are incompatible with business needs or the requests of other employees, which are more important from a "social perspective" (§ 7). In addition to paid vacation, there are between 9 and 13 public holidays in Germany. Their number varies regionally and also depends on calendar dates.

3.2. Works Councils

Collective bargaining mainly at the industry level and co-determination at the plant level are constituent elements of the industrial relations system in Germany. As mentioned above, more than 60% of all employees were covered by collective bargaining agreements in 2010, while 44% of the employees working in private sector plants with five or more employees were represented by a works council. The overlap between collective bargaining and works council representation is high, but by no means universal. In 2010, almost one in five employees who worked in a plant in which a works council existed was not covered by a collective bargaining agreement, while about 35% of all employees covered by a collective contract worked in a plant without a works council.⁴ In addition to works councils in the private sector, there are so-called personnel councils, which constitute the co-determination body at the establishment level in the public sector. Most public sector employees are represented by such institutions.

The rights and obligations of works councils are laid down in the Works Constitution Act (WCA) which originates from 1952. This institution may be more thoroughly embedded in western Germany, because the WCA only became applicable in the eastern part of the country after re-unification in 1990. Works councils are mandatory in all private sector establishments having five or more permanent employees. However, they will only come into existence if elected according to the procedures laid down in the WCA. If no such election takes place, this neglect of the law will not be sanctioned. This legal feature may explain the works council coverage rate of less than 50% despite the law's requirement to establish such institution. Works councils have to be re-elected in the regular elections taking place every four years. Otherwise, they will cease to exist.

According to the WCA, works councils are legally obliged to cooperate with management to the advantage of the workforce and the establishment (§ 2). The law establishes information, consultation and co-determination rights, which become more extensive the larger the plant. Furthermore, the legal entitlements of works councils are more widespread with regard to

⁴ See Ellguth and Kohaut (2011, Tables 1, 4 and 6), for the numbers presented in this paragraph.

personnel policy and social affairs, and less pronounced with respect to financial and economic aspects. Co-determination rights exist in particular with respect to what the law calls 'social matters' (WCA § 87) which include vacation arrangements, principles of remuneration – though not its level –, and health and safety regulations. This is the only place of the WCA where vacations are mentioned explicitly. The relevant part reads (translation provided by the Ministry of Labour and Social Affairs):

The works council shall have a right of co-determination in the following matters in so far as they are not prescribed by legislation or collective agreement: The establishment of general principles for leave arrangements and the preparation of the leave schedule as well as fixing the time at which the leave is to be taken by individual employees,

This section of the WCA implies that organizational issues regarding vacation cannot be decided upon by the firm or its personnel department but have to be determined jointly with the works council. So-called workplace agreements ("Betriebsvereinbarungen"; § 77 WCA) between a works council and a plant's management often regulate how to apply for vacation, stipulate conditions under which such applications have to be granted or can be denied, and contain provisions relating to the transfer of vacation entitlements from one year to the next as well as to the treatment of different groups of employees (cf. Neuhaus and Heidemann 2011). Such involvement of a works council is likely to increase the employees' awareness of regulations concerning vacations, especially with regard to the actual number of paid vacation days they are entitled to, and can help them to exploit their entitlements. Similar or more extensive possibilities to affect vacation arrangements, as they are contained in the WCA, are found in the laws governing the rights and obligations of personnel councils, the co-determination body of public sector employees.

In consequence, there are a number of reasons based on the interpretation of the WCA which suggest that works councils may enhance the number of vacation days taken. In addition to this legal perspective, works council may be looked at from an exit-voice perspective (Freeman and Lazear 1995). If going on vacation is equivalent to a short-term exit, employees in works council firms may take fewer vacation days because there is less need to use the exit-voice mechanism 'vacation'. Alternatively, going on vacation could also be viewed as a voice mechanism, in that, for example, discontent is expressed by emphasising personal needs. The voice mechanism 'vacation' may be employed more extensively by employees in

establishments in which there is a works council, because the council can partially protect them against reprisals or, more generally, disadvantageous consequences.

In sum, there is a variety of arguments suggesting a relationship between vacation use and the existence of a works council. In their majority, they indicate a positive relationship.

4 Data Description and Empirical Strategy

To investigate the relationship between vacation and the existence of a works council, we use the German Socio-Economic Panel (SOEP). It is a nationally representative survey, conducted each year since 1984. It covers about 20,000 participants, belonging to approximately 11,000 households in recent waves. The SOEP contains a host of information, for example, on personal and household characteristics, labour market outcome, life events, health status and attitudes on an annual basis.⁵ More sporadically, respondents have been asked about vacation use, according entitlements, and the existence of a works council.

The question relating to vacation days reads: "How many days of vacation did you actually take *last year*?" Directly afterwards it is clarified that the question refers to working days and, hence, excludes public holidays. Furthermore, the relevant waves contain a question about vacation entitlements. "How many vacation days can you take according to your contract?" Since this entitlement query directly precedes or follows immediately after the question about vacation days used, we assume that the information provided also relates to the year prior to the survey. Additionally, vacation entitlements are relatively constant over time. The query on vacation is contained in the waves 2000, 2005, and 2010 and, hence, provides information for the years 1999, 2004, and 2009. Moreover, in the waves 2005 and 2010 respondents have been asked to indicate whether they did not use up their vacation entitlements in the previous and carried them forward into the present year.

The question concerning works councils asks "Is there a works or personnel council in your establishment?" and is included in the years 2001, 2006, and 2011. Taking into account that councils are elected every four years, the SOEP questionnaires from 2001 and 2011 contain information about the respective outcomes for 1998 and 2010. The data for 2006, however, provide information about the elections in 2002 or 2006, since works council elections take

⁵ More specifically, we use the SOEP long v28 dataset. For a general in-depth discussion of the SOEP see Wagner et al. (2007). Additional information can be found at: <http://www.diw.de/english/soep/29012.html>.

place between March and May, while SOEP interviews are conducted throughout the year. Table 1 depicts the timing of council elections and the relevant SOEP information.

Table 1: Timing of Events and Questionnaire Information

	1998	1999	2000	01	02	03	04	05	06	07	08	09	10	11
Works council elections														
Information available in SOEP														
on vacation days taken														
on existence of works council														

Given the data structure described above, we have to impute the information about works council status for the years 1999, 2004 and 2009 in order to combine it with vacation data. By taking into account the year in which works council elections took place and the month in which a respondent was interviewed, and by imposing appropriate tenure requirements as well, we especially ensure that the person-specific vacation data and the plant-specific works council information relate to the same employment relationship.⁶ As a by-product, this approach automatically eliminates all employees from the sample who have not completed the probationary period and may only be able to make limited use of their vacation entitlement. Furthermore, we drop all observations for which we cannot ascertain the works council status for the year for which vacation data is available.

In the main part of the paper, we estimate the following linear regression:

$$v_{it} = x_{it}\beta + WoCo_{it}\gamma + u_{it} \quad (1)$$

In equation (1), v_{it} depicts the number of vacation days taken by individual i in period t , where $t = 1999, 2004, 2009$. Our main variable of interest in is denoted by $WoCo_{it}$ and indicates the existence of a works council at the workplace of the respondent at time t . The covariate vector x_{it} includes the number of contractually agreed days of paid vacation, the respondent's age, tenure and tenure squared, different firm size categories (20 to 199, 200 to 1999, and 2000 or more employees), the regional unemployment rate at the level of the federal state (*Bundesland*), as provided by the Federal Employment Agency (*Bundesagentur für Arbeit*), and dummy variables for being of foreign nationality, having completed an apprenticeship, having obtained a university degree, working part-time, having a temporary contract, and being a white-collar employee. In addition, we include dummy variables capturing the survey year and the sector (NACE 1-digit) in which the respondent works and, wherever appropriate, indicating the respondent's gender and whether he/she lives in the

⁶ The details of this imputation procedure are outlined in Appendix A.1.

eastern part of Germany. The parameters of equation (1) are estimated by pooled OLS under the assumption that $E(x'_{it}u_{it}) = 0$, where the regression error is denoted by $u_{it} = c_i + \varepsilon_{it}$, with c_i being the unobserved individual effect and ε_{it} the idiosyncratic error term.

In addition to the number of vacation day taken (v_{it}), we also use three other dependent variables. Weeks of vacation (vw_{it}) are defined as the ratio of vacation day taken and the number of usual working day per week. Using this measure allows to rule out the possibility that a works council vacation effect is due to an impact on the number of weekly working days. Furthermore, we consider two measures which take into account the possibility that employees in plants in which there is a works council take a different number of vacation days simply because they have other entitlements. The vacation differential (vd_{it}) is calculated as vacation entitlement less the number of days taken. Since greater usage of entitlements reduces this differential, we expect the sign of the works council dummy to be the opposite of that found for the number of vacation days taken. Finally, we create a dummy variable (vu_{it}) which is set equal to one if vacation entitlements are fully used and to zero if the number of days taken is less than the number of days an employee is entitled to.

Our sample consists of regular full- and part-time employees with a minimum tenure in accordance with the imputation of the works council data as described in Appendix A.1. Additionally, we exclude civil servants (*Beamte*), for whom different legal regulations apply than for regular employees, as well as self-employed. Since works councils can only be elected in establishments with at least five permanent employees, we also exclude individuals working in smaller establishments. In consequence, there is a maximum of 8570 observations. To account for survey design as well as panel attrition, we use SOEP weights for all analyses.

5 Results

5.1 Descriptive Findings

In our imputed data set, 70.44% of all employees work in establishments in which there is a works council. This percentage is somewhat higher than numbers reported in other sources, mainly for two reasons: First, we also include employees who state in the SOEP questionnaire that they work in the public sector, as long as they are no civil servants. Traditionally, works or personnel councils are more widespread in such sectors. Second, tenure is higher in establishments with works councils than without. Since we have to impose minimum tenure

requirements in order to impute the works council information this also contributes to an increase in the share of employees working in plants in which a council exists.⁷

Additionally, there is a huge variation between firms. In small firms (between 5 and 19 employees), 16.67% of employees are represented by a works council, whereas this rate increases to 57.80% for firms with 20 to 199 employees. Already 88.91% of the employees who work in firms with 200 to 1999 employees have elected a works council and this percentage rises to 94.02% in firms with at least 2000 employees.⁸ Looking at other subgroups, the differences are less pronounced. We find that the coverage rate is approximately 8 percentage points higher in western than in eastern Germany (71.72% vs. 63.96%). Comparing industry with services, we can discern only a small difference of about 4.5 percentage points (73.49% vs. 69.12%). Finally, note that only 1.65% of individuals in our sample change their works council status during the ten-year observation period. This small number makes it impossible to take into account time-invariant, unobservable individual- or firm-specific characteristics.

Table 2, which reports further descriptive statistics, indicates that individuals represented by a works council take almost 2.5 days more of paid vacation than respondents who have no works council in their establishment. We observe no relationship to the number of regular working days per week. Accordingly, individuals represented by a works council also take about 0.4 more vacation weeks than their non-council counterparts. Vacation entitlements for employees working in plants with a works council exceed those of employees working in a plant without such institution by almost 1.5 days. Hence, the (positive) difference between contractually agreed number of vacation days and the number of days taken, vd_{it} , is lower in plants with a works council. In particular, employees not represented by a council leave on average 2.69 days of their vacation entitlements unexploited, whereas employees of an establishment in which a works council is present only forego 1.58 days. Finally, the probability that an individual's vacation entitlements are fully used is about 11.2 percentage points higher for employees represented by a council. In sum, the evidence presented in Table 2 clearly suggests that a works council might support employees in vacation issues.

⁷ When we exclude the public sector ('öffentlicher Dienst') from our sample, the percentage of employees covered by a works council shrinks to about 63%. This number is consistent with the figure calculated by Gralla et al. (2012), who also use the SOEP and somewhat higher than the percentage reported by Ellguth and Kohaut (2011) on the basis of data from the IAB establishment panel by the Institute for Employment Research (IAB) for the first decade of this millennium.

⁸ Ellguth and Kohaut (2011), for example, report similar numbers for somewhat different firm size categories.

Table 2: Descriptive Statistics

	Works council present in plant	No works council present in plant	Difference
N° of vacation days taken (v_{it})	28.550	26.139	2.411***
Weeks of vacation (vw_{it})	5.732	5.304	0.428***
Vacation differential (vd_{it})	1.589	2.636	-1.047***
Entitlements used (vu_{it})	0.748	0.636	0.112***
Vacation entitlements	30.139	28.775	1.364***
<i>Demographics:</i>			
Age	44.201	42.086	2.115***
Women	0.400	0.462	-0.062***
Foreigner	0.089	0.078	0.011
<i>Highest qualification:</i>			
Apprenticeship	0.695	0.736	-0.041***
Academic degree	0.200	0.142	0.058***
<i>Workplace Context:</i>			
Tenure	15.041	10.431	4.610***
Part-time	0.149	0.192	-0.043***
Temporary Contract	0.027	0.030	-0.003
White-collar worker	0.650	0.619	0.031**

Note: SOEP 1999-2011. SOEP weights are used. N_all: 8570, with the exception of vacation weeks due to missing values for the number of working days per week (N=7893). Significance levels are denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2, however, also points out that individual characteristics of workers differ significantly between plants with and without a works council. It is e.g. noteworthy that average tenure of employees represented by a works council is more than 1.4 times the tenure observed for employees working in firms without council. This observed tenure difference in our data is consistent with observations based on other data sets (cf. Addison et al. 2010) and the fact that works councils reduce labour turnover (Addison et al. 2001, Frick and Möller 2003). Moreover, the share of part-time employees is much lower in works council-plants.

5.2 Basic Regression Results

In this subsection we report OLS regression results to control for observable differences between employees working in establishments in which there is a works council and plants in which no such an institution exists. We start with the results for our main dependent variable, the number of vacation days taken, in specification (1) of Table 3. Furthermore, we present

the relationship between the existence of a council and the three other dependent variables outlined above in specifications (2) to (4). Note that the vacation differential (vd_{it}) decreases in the number of days taken such that the estimated coefficients in specification (3) are expected to have the opposite sign than those in the other specifications.

Table 3: Pooled Regression Results – Four Alternative Dependent Variables

<i>Dependent variable:</i>	(1) Vacation days taken (v_{it})	(2) Weeks of vacation (vw_{it})	(3) Vacation differential (vd_{it})	(4) Full use of entitlements (vu_{it})
Works council	1.174*** (0.222)	0.229*** (0.053)	-1.015*** (0.233)	0.112*** (0.019)
Vacation entitlements	0.826*** (0.040)	0.838*** (0.109)	--	--
Age	-0.007 (0.010)	-0.002 (0.002)	0.013 (0.010)	0.000 (0.001)
Foreigner	0.358 (0.264)	0.042 (0.074)	-0.334 (0.267)	0.073*** (0.027)
Apprenticeship	-0.115 (0.233)	-0.050 (0.051)	0.82 (0.236)	-0.029 (0.024)
Academic degree	-0.166 (0.318)	-0.022 (0.065)	0.242 (0.317)	-0.030 (0.030)
Tenure	-0.054* (0.029)	-0.009 (0.006)	0.065** (0.030)	-0.002 (0.003)
Tenure ²	0.002** (0.001)	0.0003* (0.0001)	-0.002** (0.001)	0.000 (0.000)
Part-time	0.121 (0.224)	0.095* (0.053)	-0.373 (0.227)	0.071*** (0.022)
Temporary contract	-1.241*** (0.478)	-0.252** (0.103)	1.181** (0.484)	-0.066 (0.043)
Firm size: 20 ≥ & < 200	0.255 (0.296)	0.047 (0.066)	-0.146 (0.296)	-0.007 (0.022)
Firm size: 200 ≥ & < 2000	0.799** (0.328)	0.139** (0.067)	-0.708** (0.333)	0.028 (0.026)
Firm size: ≥ 2000	0.664** (0.328)	0.113 (0.067)	-0.550* (0.325)	0.008 (0.027)
White-collar worker	-0.768*** (0.203)	-0.121** (0.048)	0.809*** (0.214)	-0.102*** (0.018)
Unemployment rate	-0.060* (0.035)	-0.013* (0.007)	0.066* (0.034)	0.000 (0.003)
Women	0.365** (0.184)	0.050 (0.039)	-0.390** (0.189)	0.033* (0.017)
Eastern Germany	0.745** (0.344)	0.133* (0.074)	-0.943*** (0.337)	0.047 (0.030)
Constant	2.561* (1.367)	0.237 (0.322)	2.000** (0.966)	--
<i>N</i>	8570	7893	8570	8570
<i>(Pseudo) R</i> ²	0.343	0.474	0.031	0.033

Note: SOEP 1999-2011. Models (1) to (3) are estimated by OLS. Because vu_{it} is a binary variable, in specification (4) a probit model is used. The depicted coefficients display average marginal effects. Additionally controlled for industries (NACE 1-digit) & survey year. Standard errors in parentheses, clustered on the individual level, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ SOEP weights are used.

Specification (1) shows that an increase in entitlements by a day is associated with about 0.8 more days of vacation taken. Therefore, employees do not seem to fully exploit their vacation entitlements. This finding is consistent with results for Germany (Saborowski 2005, Schnitzlein 2012, Goerke et al. 2015) and can also be observed in other countries (Ohtake 2003, Maume 2006, Wooden and Warren 2008, Fasih 2014). Since collective bargaining agreements almost universally contain regulations on vacation entitlements, the entitlement variable also allows us to indirectly control for the impact of collective negotiations.⁹

Furthermore, a white-collar worker takes fewer vacation days. Employees working in a firm with 200 or more colleagues take more days of vacation than employees in smaller firms. Similar firm size effects have also been observed in previous investigations (Ohtake 2003, Maume 2006, Fasih 2014, and Goerke et al. 2015). However, the probability to fully exploit entitlements is not significantly related to firm size. Additionally, the number of vacation days is inversely u-shaped in tenure with a minimum at about 17 years in specification (1). While this tenure effect is opposite to what has been observed in other countries (Green and Potepan 1988, Maume 2006, Altonji and Usui 2007, and Fasih 2014), it cannot consistently be found across specifications. Women tend to have more vacation time than men. This finding is in line with results obtained for other countries (cf. Maume 2006, Altonji and Usui 2007, and Fasih 2014).

Turning to the variable of main interest, it is noteworthy that the works council dummy is consistently estimated to be positive (negative in specification (3) because unused vacation entitlements decline) and significantly different from zero (at the 1% level). Controlling for vacation entitlements in specifications (1) and (2) shows, however, that a large part of the raw difference in vacation days taken (cf. Table 2) can be attributed to disparities in vacation entitlements. Quantitatively, specifications (1) to (3) suggest that working in a plant with a works council raises the number of vacation days by at least one day per year. This finding is consistent with the result (cf. specification (4)) that being an employee in a plant in which there is a works council enhances the probability of fully exploiting vacation entitlements by roughly 11 percentage points. Therefore, we obtain consistent evidence that vacation time and the existence of a works council are positively associated.

⁹ Using the information on bargaining coverage for 1995, the only year until 2014 for which it is available in the SOEP, for those respondents who stay with their employer long enough, we find that entitlements are higher for employees covered by a collective agreement. This provides additional support for our argument that vacation entitlements are a kind of proxy for bargaining coverage.

5.3 Robustness Checks

To illustrate the robustness of our results, we first report results obtained from different estimations methods.¹⁰ Afterwards, we consider various subgroups. In particular, we differentiate according to region, sector, firm size and gender.

Since our main dependent variable, the number of vacation days taken, is a count variable, we start with re-estimating equation (1) by using a Poisson model. With an average marginal effect of about 1.3 days, the estimated works council effect is quantitatively and qualitatively the same as in our main specification (cf. Table 3, column 1). Next, we employ different matching techniques to capture selection effects into firms in which a works council exists. Neither nearest-neighbour propensity score nor Mahalanobis metric matching suggest that our positive council effect is driven by a selection bias. To the contrary, results indicate that we rather underestimate this effect using pooled OLS. Depending on the particular matching method employed, we find an average treatment effect of roughly two days per year.¹¹

Turning to the possibility of heterogeneity across subgroups, we present results for the entire sample (for specification (1)) and important sub-groups for the variable of interest in Table 4. In particular, we differentiate between the eastern and western part of Germany to cater for the different historical development of both parts of the country. Additionally, we present separate estimations for the industrial and the service sector¹² because works councils have traditionally been more widespread in male-dominated sectors, such as manufacturing or energy and mining. Finally, we look at different plant size categories. Works councils in small firms with 5 to 19 employees may play a substantially different role than in larger enterprises because labour relations are less likely to be formalised. In addition, works councils are relatively rare in such smaller firms. In contrast, the fraction of medium-sized plants with 20 to 199 employees which have or do not have a works council is broadly the same. Hence, we

¹⁰ Detailed results are available upon request.

¹¹ We identified the probability of working in a firm in which a works council exists (the so-called propensity score) using a probit model including different firm size categories, the NACE 1-digit sectors, the regional unemployment rate and whether the respondent is living in the eastern part of Germany. Using a nearest-neighbour matching without replacement and a caliper of size 0.001 resulted in the best balancing properties with standardised biases of not more than 3.3% after matching (average treatment effect on the treated = 2.250). We also employed less restrictive models to increase the number of matched individuals (almost everyone within our sample), e.g. with caliper of size 0.01 and allowing for more than one nearest-neighbour. The balancing of covariates gets slightly worse with standardised biases of up to 9.8% after matching, but the estimated average treatment effect on the treated remains nearly unchanged (2.052).

¹² Based on the NACE 1-digit information, the industrial sector subsample consists of employees working in manufacturing, construction, energy and mining. The service sector subsample covers respondents employed in services, trade, transport and banking/ insurances.

observe a more balanced incidence of councils across such firms (cf., Addison et al. 2001, Addison and Teixeira 2006, Jirjahn and Mueller 2014).

Table 4: Institutional Subgroup Analysis

	(1) All (cf. Table 3, col. 1)	(2) West	(3) East	(4) Industry	(5) Service	(6) Firms with 5 to 19 employees	(7) Firms with 20 to 199 employees
Works council	1.174*** (0.222)	1.127*** (0.263)	1.339*** (0.368)	1.228*** (0.390)	1.155*** (0.272)	1.912*** (0.436)	1.025*** (0.314)
<i>N</i>	8570	6457	2113	3457	4912	1232	2712
<i>R</i> ²	0.343	0.339	0.388	0.248	0.401	0.390	0.332

Note: SOEP 1999-2011. Dependent variable: Number of vacation days taken. The table reports *OLS* estimates. Control variables are the same as in Table 3, column 1, and described in Section 4. Standard errors in parentheses, clustered on the individual level, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. SOEP weights are used.

Again, the works council vacation nexus is consistently estimated to be positive at the 1% significance level and varies only slightly in size. We find a somewhat stronger effect for employees in small firms (5 to 19 employees) who seem to benefit more comprehensively from the existence of a works council with almost two additional vacation days per year.

We also estimated the specifications depicted in Table 4 for a sample from which we excluded all those respondents who state to work in the public sector, since the SOEP questionnaire does not explicitly differentiate between representation by a works or personnel council. The results for the restricted sample (not documented) are qualitatively and quantitatively comparable to those for the more encompassing sample.

In our final subgroup-specific analysis we differentiate men and women (see Table 5). We do so mainly for two reasons: First, the estimates presented in Table 3 indicate that women tend to take more vacation days used. Second, works councils may be more inclined to pursue issues which are important for the male part of a firm's workforce since their members are largely male (61.6% in our ten-year observation period).

Table 5: Subgroup Analysis by Gender

	(1) All	(2) Men	(3) Women
Works council	1.174*** (0.222)	1.699*** (0.304)	0.473 (0.318)
<i>N</i>	8570	4854	3716
<i>R</i> ²	0.343	0.283	0.429

Note: SOEP 1999-2011. Dependent variable: Number of vacation days taken. The table reports *OLS* estimates. Control variables are the same as in Table 3, column 1, and described in Section 4. Standard errors in parentheses, clustered on the individual level, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. SOEP weights are used.

For the subsample of men, we again find a highly significant correlation between the existence of a works council and vacation use. Compared to the pooled sample, the estimated effect increases by roughly half a day. For women, however, we do not observe such a correlation.

In order to ascertain the robustness of these differential findings for men and women, we further look at the various subgroups scrutinised above (cf. Table 4). Across all subsamples and all specifications, the estimated coefficients for the subgroup of men are significantly different from zero and exceed those depicted in Tables 3 for a combined sample (for detailed results, see Appendix A.2). The estimated coefficients of the works council dummy for the subsamples of women are mostly insignificant. However, there are two exceptions. First, women seem to benefit in some cases from the existence of a works council in that their probability to fully exploit their vacation entitlements is higher than for their non-works council counterparts. Second, we consistently find a significantly positive works council effect for women in very small firms, and in two out of four cases also within the service sector.

When searching for the cause of the gender differences one may hypothesise that works council predominantly act in the interests of the median employee. Since labour force participation of women is lower than that of men in Germany and because the share of part-time employees was much higher among women than among men during the observation period, the median employee in many plants is likely to be a man. However, this does not necessarily apply to the service sector and to small firms, where the shares of female employees in our sample exceed 50%. In addition, the labour force participation rate of women in eastern Germany was much higher than in western Germany for historical reasons. Therefore, we would expect a positive correlation between the existence of a works council and vacation use by women in subsamples of firms, sectors or regions, for which the median employee is more likely to be female. However, even within these subsamples we only find a works council vacation effect for women who work in very small firms. Hence, we obtain no consistent evidence in support of the claim that there is no works council vacation effect for women because councils act on behalf of the median employee, who is generally male.

An alternative explanation for the gender-specific findings is based on investigating the degree of utilization of vacation entitlements only for those workers who work in establishments without a council. Employing a Tobit model with vacation days taken divided by vacation entitlements as dependent variable, we find that women exploit their entitlements

to a greater extent than men (roughly 5 percentage points) even in the absence of a works council.¹³ This positive and highly significant female dummy can be found for most subsamples. The exceptions are those subsamples for which we also find a positive works council vacation nexus for women, namely very small firms and the service sector. Hence, there is some evidence which suggests that women may simply not need a works council in order to increase the use of vacation since they already exploit their vacation entitlements to a statistically and economically significantly higher degree than men do. If this is not the case, as it appears to be true in small firms, for example, the existence of a works council is not only associated with a more vacation days taken by men, but also by women.

5.4 Looking for the Causes of Council Influence

The Works Constitution Act (WCA) provides some indication that works councils may affect the use of vacation entitlements but establishes no detailed legal procedures of how such an impact can be attained. In this subsection we analyse potential channels of influence in order to gain further insights into the relationship between works council and vacation use. Since we observe a works council vacation effect consistently solely for men, we focus on the male subsample in the subsequent exposition. The findings, however, also apply to the full sample.

The WCA establishes co-determination rights not only with respect to vacation arrangements in § 87 (see sub-section 3.2 above), but also more generally with regard to daily and weekly working time. Therefore, it may be conjectured that working time arrangements are more formalised in plants in which there is a works council. Hence, employees working in such plants may simply be more aware of their vacation entitlements and, therefore, less likely to leave them unexploited. In order to analyse this conjecture we make use of information available in waves 2004 and 2009 of the SOEP which indicate whether there are so-called working time accounts in the plant in which the respondent works. Such accounts allow firms and employees to deviate from the daily or weekly working time as stipulated in the contract and to balance the actual and the paid volume of hours of work over a longer time horizon.

Moreover, the Federal Vacation Law enables employees to some extent to transfer unused vacation entitlements from one year into the next (cf. Section 3.1). The possibility of such transfers can be argued to raise the probability of eventually foregoing entitlements. If works councils establish tighter rules on shifting unused entitlements into the future, it becomes less

¹³ Complete results are available upon request.

likely that such intertemporal transfers indirectly reduce the number of vacation days taken. Information on whether employees transferred vacation entitlements into the next year and actually used them is provided in the SOEP waves 2005 and 2010 and relates to the previous years, respectively.

If the works council vacation effect is partially due to a stricter formalisation of working time arrangements, we would expect such formalisation to increase the use of vacation days and to lower the estimated works council coefficient quantitatively since the estimated coefficients in the specifications without these additional control variables describe the combined impact of working time formalisation and the remaining (unexplained) works council impact.

Works council may also alter vacation use if they affect an employee's job security and individuals with greater concerns for their job are less likely to take paid vacation. Supportive evidence for this line of argument can be deduced from the evidence reported in Section 2 that job stability is higher in establishments with a works council (cf. Addison et al. 2001, Frick and Möller 2003, and Hirsch et al. 2010) and vacation use by employees with temporary contracts is lower (cf. Table 3). The SOEP contains information on concerns regarding job security and on the own economic situation for all the three relevant waves. As in the case of indicators of the formalisation of working time, we would expect that the estimated coefficients for the works council dummy become smaller and may lose significance, when additionally including a measure of job security in equation (1).

Finally, we know that works councils are associated with higher wages (see, inter alia, Addison et al. 2001, Addison et al. 2010, and Hübler and Jirjahn 2003 to some extent). If taking vacation is a normal good, the observed works council vacation nexus may simply be an income effect. In order to scrutinise this conjecture, we additionally control for monthly gross income, additional Christmas payments and holiday allowances. This information is also available for all three relevant waves. We expect that the works council dummy shrinks in size and significance if the vacation effect is due to differential income levels in works council and non-works council plants.

In Table 6 we present the estimated coefficients of interest for specifications of equation (1) in which we have added the additional control variables separately. In the first row we also depict the estimated coefficients for the works council variable for the same specifications without the additional variables, but using exactly the same sample. This becomes necessary because using the additional information often reduces sample size, and sometimes considerably so.

The findings support the suggestion that a stricter formalisation of working time arrangements indeed enhances vacation use (Table 6, col. 1, 2). However, we find no indication of a job security effect (col. 3, 4) and the estimated coefficients on income variables (col. 5, 6) provide mixed evidence with regard to vacation being a normal good. More importantly, the estimated coefficients of the works council dummy are basically unaffected by the inclusion of the additional control variables, as the comparison of rows one and two shows. Hence, the works council vacation nexus does not appear to be due to either greater formalisation of working time and vacation arrangements, greater job security or a higher income in works council plants.

Table 6: Inclusion of Additional Covariates

	Formalization of Working Time		Higher Job Security		Income Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Works council <i>(without additional controls but with same sample size)</i>	2.340*** (0.463)	2.288*** (0.396)	1.719*** (0.306)	1.730*** (0.304)	1.699*** (0.304)	1.659*** (0.308)
Works council	2.259*** (0.473)	2.122*** (0.365)	1.703*** (0.306)	1.732*** (0.305)	1.650*** (0.303)	1.626*** (0.311)
Working time account	0.496* (0.295)					
No foregone entitlements in previous year		4.923*** (0.794)				
Worries about job security			0.130 (0.147)			
Worries about economic Situation				-0.021 (0.151)		
Monthly gross income <i>(in thousand €)</i>					-0.339*** (0.093)	
Special payments <i>(in thousand €)</i>						0.116* (0.068)
Constant	6.541** (2.676)	-0.701 (2.326)	3.127* (1.647)	2.998* (1.621)	2.589 (1.614)	3.156* (1.679)
<i>N</i>	2381	3011	4785	4841	4854	4656
<i>R</i> ²	0.220	0.313	0.280	0.282	0.289	0.285

Note: SOEP 1999-2011. Only men. Dependent variable: Number of vacation days taken. The table reports OLS estimates. Standard errors in parentheses, clustered on the individual level, * p < 0.10, ** p < 0.05, *** p < 0.01. All specifications include the standard controls. SOEP weights are used.

6. Summary

This paper draws attention to an effect of works councils which has hitherto gone unnoticed. Looking at the period 1999 to 2009, we find that the existence of a works council is associated with more extensive vacation use by employees, relative to employees who work

in plants without such an institution. This relationship is particularly strong for men and can be observed consistently across subgroups. For the entire sample, our OLS estimates indicate that male employees substantially benefit from a works council, in that the duration of vacation taken annually rises by about 2 days. This finding is corroborated for other measures of vacation use. Assuming 200 working days per annum, the vacation effect translates into a wage increase of close to 1%. For women, however, no such works council vacation effect is consistently discernible. We only find evidence of a positive correlation for female employees in small firms and in the service sector. From further regression analyses we tentatively conclude that works councils do not enhance vacation use of women because they generally utilise their entitlements to a much greater degree than men. Consequently, there is less scope for a works council effect.

As regards the channel by which works councils might raise the number of vacation days used, the findings presented above do not support the hypotheses that works council plants are characterised by (1) more extensive formalisation of working time arrangements, (2) greater job security or (3) higher income and that the works council vacation nexus is due to such effects. There are at least two further plausible explanations for the existence of the works council vacation nexus. First, employees who are working in a firm where a works council exists are simply better informed about the concrete number of days they are entitled to and that they can demand their rights. Second, employees' requests for leave might be approved more easily due to the pure existence of a works council since employers are aware of the council's co-determination rights and the possible support for employees in case of disputes. To fit in with the observed gender differences – which have also been found for the U.S. labour force and could not be explained by work-family priorities (Maume 2006) –, these lines of reasoning would require that either women are generally better informed about their rights than men or that their leave requests are approved more easily by employers. The available data neither provides the necessary information to test these suggestions nor allows drawing causal inferences in general. Hence, our investigation points to a previously unnoticed additional benefit of an existing works council in an establishment, but also indicates directions for future research.

7. References

- Addison, John T. (2009), *The Economics of Codetermination. Lessons from the German Experience*, Palgrave Macmillan.
- Addison, John T. and Paulino Teixeira (2006), The Effects of Works Councils on Employment Change, *Industrial Relations* 45(1), 1-25.
- Addison, John T., Schnabel, Claus and Joachim Wagner (2001), Works Councils in Germany: Their Effects on Establishment Performance, *Oxford Economic Papers* 53(4), 659-694.
- Addison, John T., Teixeira, Paulino and Thomas Zwick (2010), German Works Councils and the Anatomy of Wages, *Industrial and Labor Relations Review* 63(2), 247-270.
- Altonji, Joseph G. and Emiko Usui (2007), Work Hours, Wages, and Vacation Leave, *Industrial and Labor Relations Review* 60(3), 408-428.
- Beblo, Miriam and Elke Wolf (2004), Chancengleichheit und Vereinbarkeit von Familie und Beruf – Faktoren des betrieblichen Engagements, *WSI Mitteilungen* 10-2004, 561-567.
- Bryan, Mark L. (2006), Paid Holiday Entitlements, Weekly Working Hours and Earnings in the UK, ISER Working Paper 2006-52, University of Colchester.
- Buchmueller, Thomas C., DiNardo, John E. and Robert G. Valetta (2004), A Submerging Labor Market Institution? Unions and Nonwage Aspects of Work, 231-263, in: Freeman, Richard B., Hersch, Joni and Lawrence Mishel (eds), *Emerging Labor Market Institutions for the Twenty-First Century*, University of Chicago Press.
- Buckley, John E. (1989), Variations in Holidays, Vacations, and Area Pay Levels, *Monthly Labor Review* 112(2), 24-30.
- de Bloom, Jessica, Geurts, Sabine A.E., Sonnentag Sabine, Taris Toon, de Weerth, Carolina and Michiel A.J. Kompier (2011), How does a Vacation from Work Affect Employee Health and Well-being?, *Psychology and Health* 26(12), 1606-1622.
- Ellguth, Peter and Susanne Kohaut (2011), Tarifbindung und betriebliche Interessenvertretung: Aktuelle Ergebnisse aus dem IAB-Betriebspanel 2010, *WSI-Mitteilungen* 5-2011, 242-247.
- Fakih, Ali (2014), Vacation Leave, Work Hours and Wages: New Evidence from Linked Employer-Employee Data, *Labour* 28(4), 376-398.
- Freeman, Richard B. and Edward P. Lazear (1995), An Economic Analysis of Works Councils, 27-50, in: Rogers, Joel and Wolfgang Streeck (eds.), *Works Councils - Consultation, Representation and Cooperation in Industrial Relations*, University of Chicago Press.
- Frick, Bernd and Iris Möller (2003), Mandated Works Councils and Firm Performance: Labor Productivity and Personnel Turnover in German Establishments, *Schmollers Jahrbuch* 123(3), 423-454.
- Fritz, Charlotte and Sabine Sonnentag (2006), Recovery, Well-Being, and Performance-Related Outcomes: The Role of Workload and Vacation Experiences, *Journal of Applied Psychology* 91(4), 936-945.
- Goerke, Laszlo, Jeworrek, Sabrina and Markus Pannenberg (2015), Trade Union Membership and Paid Vacation in Germany, *IZA Journal of Labour Economics* 4:17.
- Gralla, Rafael, Kraft, Kornelius and Julia Lang (2012), Let's call it a Day – The Effect of Works Councils on Working Hours Constraints in German Establishments, *SFB 823 Discussion Paper* 36/2012.
- Green, Francis (1997), Union Recognition and Paid Holiday Entitlements, *British Journal of Industrial Relations* 35(2), 243-255.

- Green, Francis and Michael J. Potepan (1988), Vacation Time and Unionism in the U.S. and Europe, *Industrial Relations* 27(2), 180-194.
- Grund, Christian and Andreas Schmitt (2013), Works Councils, Wages and Job Satisfaction, *Applied Economics* 45(3), 299-310.
- Heywood, John S. and Uwe Jirjahn (2009), Family-Friendly Practices and Worker Representation in Germany, *Industrial Relations* 48(1), 121-145.
- Hirsch, Boris, Schank, Thorsten and Claus Schnabel (2010), Works Councils and Separations: Voice, Monopoly, and Insurance Effects, *Industrial Relations* 49(4), 566-592.
- Hübler, Olaf and Uwe Jirjahn (2003), Works Councils and Collective Bargaining in Germany: The Impact on Productivity and Wages, *Scottish Journal of Political Economy* 50(4), 471-491.
- Jirjahn, Uwe (2008), On the Determinants of Shift Work and Overtime Work: Evidence from German Establishment Data, *British Journal of Industrial Relations* 46(1), 133-168.
- Jirjahn, Uwe (2011), Ökonomische Wirkungen der Mitbestimmung in Deutschland: Ein Update, *Schmollers Jahrbuch* 131(1), 3-57.
- Jirjahn, Uwe and Steffen Mueller (2014), Non-union Worker Representation, Foreign Owners, and the Performance of Establishments, *Oxford Economic Papers* 66(1), 140-163.
- Kraft, Kornelius and Julia Lang (2008), The Causes and Consequences of Adopting a Works Council, *Jahrbücher für Nationalökonomie und Statistik* 228(5+6), 512-532.
- Maume, David J. (2006), Gender Differences in Taking Vacation Time, *Work and Occupations* 33(2), 161-190.
- Neuhaus, Markus and Ralf Heidemann (2011), Urlaubsgrundsätze und Urlaubsplanung, *Betriebs- und Dienstvereinbarungen / Kurzauswertungen* (http://www.boeckler.de/pdf/mbf_bvd_urlaubsgrundsaeetze.pdf; accessed December 2, 2015).
- Ohtake, Fumio (2003), Unions, the Costs of Job Loss and Vacation, 371-390, in: Ogura, Seiritsu, Tachibanaki, Toshiaki and David A. Wise (eds), *Labor Markets and Firm Benefit Policies in Japan and the United States*, University of Chicago Press.
- Ray, Rebecca and John Schmitt (2007), No-vacation Nation USA – a Comparison of Leave and Holiday in OECD Countries, ETUI-REHS, *European Economic and Employment Policy Brief* 3 – 2007.
- Ray, Rebecca, Sanes, Milla and John Schmitt (2013), No-Vacation Nation Revisited, *CEPR Report*.
- Saborowski, Christian (2005), Under-Utilisation of Holiday Entitlements as a Career Investment, *DIW Research Notes* 7.
- Schank, Thorsten and Claus Schnabel (2004), Betriebliche Determinanten des Überstundeneinsatzes, 37-62, in: Bellmann, Lutz and Claus Schnabel (eds), *Betriebliche Arbeitszeitpolitik im Wandel*, Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg.
- Schnitzlein, Daniel D. (2012), Extent and Effects of Employees in Germany Forgoing Vacation Time, *DIW Economic Bulletin* 2(2), 25-31.
- Shi, Jingye and Mikal Skuterud (2015), Gone Fishing! Reported Sickness Absenteeism and the Weather, *Economic Inquiry* 53(1), 388-405.
- Stock, James H. and Motohiro Yogo (2005), Testing for Weak Instruments in Linear IV Regression, 80-108, in: Andrews, Donald W. K. and James H. Stock (eds), *Identification and Inference for Econometric Models*, Cambridge University Press.
- Vella, Francis and Marno Verbeek (1999), Estimating and Interpreting Models with Endogenous Treatment Effects, *Journal of Business & Economic Statistics* 17(4), 473-478.

- Wagner, Gerd G., Frick, Joachim R. and Jürgen Schupp (2007), The German Socio-Economic Panel Study (SOEP) – Scope, Evolution, and Enhancements, *Schmollers Jahrbuch* 127(1), 139-169.
- Westman, Mina and Dalia Etzion (2001), The Impact of Vacation and Job Stress on Burnout and Absenteeism, *Psychology and Health* 16(5), 595-606.
- Wooden, Mark and Diana Warren (2008), Paid Annual Leave and Working Hours: Evidence from the HILDA Survey, *Journal of Industrial Relations* 50(4), 664-670.
- WSI (2015), *Statistisches Taschenbuch – Tarifpolitik*, (http://www.boeckler.de/pdf/p_ta_tariftaschenbuch_2015.pdf; accessed November 27, 2015).

Appendix

A.1 - Detailed Information on Imputation of Works Council Information

We impute the information on the works council status of the respondent's workplace for the year for which s/he provides information on vacation in the following manner. First, we establish the works council status of the firm in which the respondent works for the years 1999, 2004, and 2009, i.e. those years for which we have information on vacation. When doing so, we take into account that works council elections normally take place between March and May of an election year and neglect the possibility that works councils are either abolished or newly introduced in between election years. Anecdotal evidence suggests that such changes in council status are indeed rare events. Second, we ascertain that the respondent was actually employed in the firm for which we determined the works council status during the entire year for which we have information on vacation.

Step 1:

In order to determine the works council status of a firm, we treat responses to the works council question in the following way:

- a) Responses in 2001 provide information about works council status of the establishment the respondent works at for 1999, because council elections took place in 1998.
- b1) Responses in 2006, if the interview occurred in January or February, provide information about the council status of the firm for 2004, because there were elections in 2002 and new councils were elected from March 2006 onwards.
- b2) Responses in 2006, if the interview occurred in June or later in that year, provide information about the firm's council status for 2009 because the next election took place in 2010.
- b3) Finally, responses during March to May 2006 can provide information about election outcomes for the years 2002 or 2006, since we do not know whether the response refers to the before- or after-2006-election situation.
- c) Responses to the works council question in 2011 provide information about the outcome of elections in 2010.

Based on the above categorisation, we know the works council status of establishments for the year 1999 in case a), for the year 2004 in case b1), and for the year 2009 in case b2). Furthermore, if the information about works council status obtained from a) and b3) (respectively, b3) and c)) is the same for the years 2001 and 2006 (respectively, 2006 and 2010), we impute this information for the intermittent year 2004 (2009).

Step 2:

We ascertain whether the person has already worked in the same firm s/he worked at in 2001, 2006, and 2011, respectively, during the entire year 1999, 2004, or 2009. If the resulting tenure requirement is met, we can impute the information on works council status of an establishment for the years for which we have information about individual vacation days.

Table A1 summarises our procedure.

Table A 1: Imputation procedure for information about works councils

Data Requirement	Imputation Consequence
<ul style="list-style-type: none"> - respondent in sample in 1999 - 2001 - tenure ≥ 3 years in 2001 	Works council information from 2001 is imputed for 1999
<ul style="list-style-type: none"> - respondent in sample in 2004 - 2006 - interview month in 2006 is Jan./ Feb. - tenure ≥ 2.5 years in 2006 	Works council information from 2006 is imputed for 2004
<ul style="list-style-type: none"> - respondent in sample in 2001 & 2004 - 2006 - interview month in 2006 is March/April/May - council status is the same in 2001 & 2006 - tenure in 2006 ≥ 5.5 years 	Identical works council information from 2001 and 2006 is imputed for 2004
<ul style="list-style-type: none"> - respondent in sample in 2006 & 2009 - 2011 - interview month in 2006 is March/April/May - council status is the same in 2006 & 2011 - tenure in 2011 ≥ 6 years 	Identical works council information from 2006 and 2011 is imputed for 2009
<ul style="list-style-type: none"> - respondent in sample in 2006, 2009 & 2010 - interview month in 2006 is June or later - tenure in 2009 ≥ 3.5 years 	Works council information from 2006 is imputed for 2009

A.2 - Gender Differences by Subsample and Dependent Variable

		All	West	East	Industry	Service	5-19	20-199
<i>Dependent variable: Vacation days taken, v_{it}</i>								
Men	Works	1.699***	1.691***	1.969***	1.771***	1.718***	2.719***	1.539***
	council	(0.304)	(0.348)	(0.556)	(0.466)	(0.396)	(0.905)	(0.402)
	<i>N</i>	4854	3801	1053	2661	2066	583	1513
Women	Works	0.473	0.371	0.606	-0.461	0.672*	1.777***	0.254
	council	(0.318)	(0.388)	(0.404)	(0.579)	(0.376)	(0.898)	(0.452)
	<i>N</i>	3716	2656	1060	796	2846	649	1199

<i>Dependent variable: Weeks of vacation per annum, w_{it}</i>								
Men	Works	0.285***	0.277***	0.318***	0.295***	0.283***	0.338*	0.303***
	council	(0.059)	(0.066)	(0.121)	(0.086)	(0.080)	(0.193)	(0.079)
	<i>N</i>	4510	3562	948	2514	1880	560	1424
Women	Works	0.105	0.090	0.104	-0.107	0.103	0.267*	-0.038
	council	(0.074)	(0.087)	(0.079)	(0.115)	(0.079)	(0.140)	(0.095)
	<i>N</i>	3383	2424	959	782	2534	595	1089

<i>Dependent variable: Difference between vacation entitlements and days taken, vd_{it}</i>								
Men	Works	-1.583***	-1.643***	-1.216**	-1.685***	-1.572***	-2.145**	-1.469***
	council	(0.303)	(0.347)	(0.539)	(0.465)	(0.397)	(0.917)	(0.396)
	<i>N</i>	4854	3801	1053	2661	2066	583	1513
Women	Works	-0.274	-0.203	-0.397	0.568	-0.465	-1.684***	0.128
	council	(0.350)	(0.423)	(0.369)	(0.572)	(0.422)	(0.520)	(0.446)
	<i>N</i>	3716	2656	1060	796	2846	649	1199

<i>Dependent variable: Full use of vacation entitlements, vu_{it}</i>								
Men	Works	0.126***	0.128***	0.122***	0.117***	0.130***	0.231***	0.111***
	council	(0.026)	(0.030)	(0.045)	(0.036)	(0.039)	(0.080)	(0.034)
	<i>N</i>	4854	3801	1053	2661	2066	578	1507
Women	Works	0.086***	0.090***	0.037	-0.001	0.106***	0.242***	0.056
	council	(0.027)	(0.032)	(0.038)	(0.055)	(0.030)	(0.060)	(0.037)
	<i>N</i>	3713	2655	1058	793	2846	647	1194

Note: SOEP 1999-2011. The table reports OLS estimates. Because vu_{it} is a binary variable, a probit model is used in that case and the depicted coefficients display average marginal effects.

Control variables are the same as described in Section 4. Standard errors in parentheses, clustered on the individual level, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ SOEP weights are used.

IAAEU Discussion Paper Series in Economics

- 01/2012 Relative Consumption Concerns or Non-Monotonic Preferences?
Inga Hillesheim and Mario Mechtel
- 02/2012 Profit Sharing and Relative Consumption
Laszlo Goerke
[published as: Goerke, L. (2013). Profit Sharing and Relative Consumption. *Economics Letters* 118, 167-169.]
- 03/2012 Conspicuous Consumption and Communism: Evidence From East and West Germany
Tim Friehe and Mario Mechtel
[published as: Friehe, T. and M. Mechtel (2014). Conspicuous Consumption and Political Regimes: Evidence from East and West Germany. *European Economic Review* 67, 62-81.]
- 04/2012 Unemployment Benefits as Redistribution Scheme for Trade Gains - A Positive Analysis
Marco de Pinto
[published as: de Pinto, M. (2013). International Trade and Unemployment: on the Redistribution of Trade Gains when Firms Matter, Physica-Verlag (Springer), Berlin.]
- 05/2012 Failure of Ad Valorem and Specific Tax: Equivalence under Uncertainty
Laszlo Goerke, Frederik Herzberg and Thorsten Upmann
[revised version published as: Goerke, L., F. Herzberg and T. Upmann (2014). Failure of Ad Valorem and Specific Tax Equivalence under Uncertainty. *International Journal of Economic Theory* 10, 387-402.]
- 06/2012 The Redistribution of Trade Gains and the Equity-Efficiency Trade-Off
Marco de Pinto
[published as: de Pinto, M. (2013). International Trade and Unemployment: on the Redistribution of Trade Gains when Firms Matter, Physica-Verlag (Springer), Berlin.]
- 07/2012 Trade Union Membership and Sickness Absence: Evidence from a Sick Pay Reform
Laszlo Goerke and Markus Pannenberg
[published as: Goerke, L. and M. Pannenberg (2015). Trade Union Membership and Sickness Absence: Evidence from a Sick Pay Reform. *Labour Economics* 33, 13-25.]
- 08/2012 Risk-Sorting and Preference for Team Piece Rates
Agnes Bäker and Vanessa Mertins
[published as: Bäker, A. and V. Mertins (2013). Risk-Sorting and Preference for Team Piece Rates. *Journal of Economic Psychology* 34, 285-300.]
- 09/2012 Union Wage Setting and International Trade
Hartmut Egger and Daniel Etzel
[published as: Egger, H. and D. Etzel (2014). Union wage-setting and international trade with footloose capital. *Regional Science and Urban Economics* 48, 56-67.]

- 10/2012 How Much Do Others Matter? Explaining Positional Concerns for Different Goods and Personal Characteristics
Inga Hillesheim and Mario Mechtel
[published as: Hillesheim, I. and M. Mechtel (2013). How Much Do Others Matter? Explaining Positional Concerns for Different Goods and Personal Characteristics. *Journal of Economic Psychology* 34, 61-77.]
- 11/2012 Benefit Morale and Cross-Country Diversity in Sick Pay Entitlements
Daniel Arnold
[published as: Arnold, D. (2013). Benefit Morale and Cross-Country Diversity in Sick Pay Entitlements. *Kyklos* 66, 27-45.]
- 01/2013 Relative Consumption and Tax Evasion
Laszlo Goerke
[published as: Goerke, L. (2013). Relative Consumption and Tax Evasion. *Journal of Economic Behavior & Organization* 87, 52-65.]
- 02/2013 Variants of the Monoamine Oxidase A Gene (MAOA) Predict Free-riding Behavior in Women in a Strategic Public Goods Experiment
Vanessa Mertins, Andrea B. Schote and Jobst Meyer
[published as: Mertins, V., A.B. Schote and J. Meyer (2013). Variants of the Monoamine Oxidase A Gene (MAOA) Predict Free-riding Behavior in Women in a Strategic Public Goods Experiment. *Journal of Neuroscience, Psychology, and Economics* 6, 97-114.]
- 03/2013 Direct Evidence on Income Comparisons and Subjective Well-Being
Laszlo Goerke and Markus Pannenberg
- 04/2013 Flexibilisation without Hesitation? Temporary Contracts and Workers' Satisfaction
Adrian Chadi and Clemens Hetschko
[forthcoming as: Chadi, A and C. Hetschko. Flexibilisation without Hesitation? Temporary Contracts and Job Satisfaction. *Oxford Economic Papers*.]
- 05/2013 Structural and Cyclical Effects of Tax Progression
Jana Kremer and Nikolai Stähler
- 06/2013 Regional Unemployment and Norm-Induced Effects on Life Satisfaction
Adrian Chadi
[published as: Chadi, A. (2014). Regional Unemployment and Norm-Induced Effects on Life Satisfaction. *Empirical Economics* 46, 1111-1141.]
- 07/2013 Third Person Effects in Interview Responses on Life Satisfaction
Adrian Chadi
[published as: Chadi, A. (2013). Third Person Effects in Interview Responses on Life Satisfaction. *Journal of Applied Social Science Studies (Schmollers Jahrbuch)* 133, 323-333.]
- 08/2013 The Role of Task Meaning on Output in Groups: Experimental Evidence
Agnes Bäker and Mario Mechtel
- 09/2013 Gender Differences in Responsiveness to a Homo Economicus Prime in the Gift-Exchange Game
Vanessa Mertins and Susanne Warning

- 10/2013 Relative Consumption, Working Time, and Trade Unions
Laszlo Goerke and Inga Hillesheim
[published as: Goerke, L. and I. Hillesheim (2013). Relative Consumption, Working Time, and Trade Unions. *Labour Economics* 24, 170-179.]
- 11/2013 The Role of Interviewer Encounters in Panel Responses on Life Satisfaction
Adrian Chadi
[published as: Chadi, A. (2013). The Role of Interviewer Encounters in Panel Responses on Life Satisfaction. *Economics Letters* 121, 550-554.]
- 12/2013 It's the Occupation, Stupid! Explaining Candidates' Success in Low-Information Elections
Mario Mechtel
[published as: Mechtel, M. (2014). It's the occupation, stupid! Explaining candidates' success in low-information elections. *European Journal of Political Economy* 33, 53-70.]
- 13/2013 Do Overconfident Workers Cooperate Less? The Relationship between Overconfidence and Cooperation in Team Production
Vanessa Mertins and Wolfgang Hoffeld
[published as: Mertins, V. and W. Hoffeld (2015). Do Overconfident Workers Cooperate Less? The Relationship between Overconfidence and Cooperation in Team Production. *Managerial and Decision Economics* 36, 265-274.]
- 01/2014 Income Tax Buyouts and Income Tax Evasion
Laszlo Goerke
[published as: Goerke, L. (2015). Income Tax Buyouts and Income Tax Evasion. *International Tax and Public Finance* 22, 120-143.]
- 02/2014 Family Employees and Absenteeism
Jörn Block, Laszlo Goerke, José María Millán and Concepción Román
[published as: Block, J., L. Goerke, J.M. Millán and C. Román (2014). Family employees and absenteeism. *Economics Letters* 123, 94-99.]
- 03/2014 Dissatisfied with Life or with Being Interviewed? Happiness and Motivation to Participate in a Survey
Adrian Chadi
- 04/2014 Gambling to Leapfrog in Status?
Tim Friehe and Mario Mechtel
[forthcoming as Friehe, T. and M. Mechtel. Gambling to Leapfrog in Status. *Review of Economics of the Household*.]
- 05/2014 The Magic of the New: How Job Changes Affect Job Satisfaction
Adrian Chadi and Clemens Hetschko
- 06/2014 The Labor Market Effects of Trade Unions – Layard Meets Melitz
Marco de Pinto and Jochen Michaelis
[forthcoming as: de Pinto, M. and J. Michaelis. The Labor Market Effects of Trade Unions – Layard Meets Melitz. *International Economics and Economic Policy*.]
- 07/2014 Workers' Participation in Wage Setting and Opportunistic Behavior: Evidence from a Gift-Exchange Experiment
Jörg Franke, Ruslan Gurtoviy and Vanessa Mertins

- 08/2014 When Pay Increases are Not Enough: The Economic Value of Wage Delegation in the Field
Sabrina Jeworrek and Vanessa Mertins
- 09/2014 Tax Evasion by Individuals
Laszlo Goerke
[forthcoming as: Goerke, L. Tax Evasion by Individuals. *Encyclopedia of Law and Economics: Springer Reference.*]
- 10/2014 Sickness Absence and Works Councils
Daniel Arnold, Tobias Brändle and Laszlo Goerke
- 11/2014 Positional Income Concerns: Prevalence and Relationship with Personality and Economic Preferences
Tim Friehe, Mario Mechtel and Markus Pannenberg
- 12/2014 Unionization, Information Asymmetry and the De-location of Firms
Marco de Pinto and Jörg Lingens
- 01/2015 The One Constant: A Causal Effect of Collective Bargaining on Employment Growth? Evidence from German Linked-Employer-Employee Data
Tobias Brändle and Laszlo Goerke
- 02/2015 How Job Changes Affect People's Lives – Evidence from Subjective Well-being Data
Adrian Chadi and Clemens Hetschko
- 03/2015 Concerns about the Euro and Happiness in Germany during Times of Crisis
Adrian Chadi
[forthcoming as: Chadi, A. Concerns about the Euro and Happiness in Germany during Times of Crisis. *European Journal of Political Economy* 40, 126-146.]
- 04/2015 Missing at Work – Sickness-related Absence and Subsequent Job Mobility
Adrian Chadi and Laszlo Goerke
- 05/2015 Social Identity and Social Free-Riding
Mark Bernard, Florian Hett and Mario Mechtel
[forthcoming as: Bernard, M., F. Hett and M. Mechtel. Social Identity and Social Free-Riding. *European Economic Review.*]
- 06/2015 Peer Settings Induce Cheating on Task Performance
Agnes Bäker and Mario Mechtel
- 07/2015 The Protestant Fiscal Ethic: Religious Confession and Euro Skepticism in Germany
Adrian Chadi and Matthias Krapf
- 08/2015 Firm-level versus Sector-level Trade Unions – The Role of Rent-Sharing Motives
Marco de Pinto

- 09/2015 Direct Evidence for Income Comparisons and Subjective Well-Being across Reference Groups
Laszlo Goerke and Markus Pannenberg
[published as: Goerke, L. and M. Pannenberg. Direct Evidence for Income Comparisons and Subjective Well-Being across Reference Groups. *Economics Letters* 137: 95-101.]
- 10/2015 Leadership and persistency in spontaneous dishonesty
Susanne Braun and Lars Hornuf
- 11/2015 How are Work-related Characteristics Linked to Sickness Absence and Presenteeism?
– Theory and Data –
Daniel Arnold and Marco de Pinto
- 01/2016 Paid Vacation Use: The Role of Works Councils
Laszlo Goerke and Sabrina Jeworrek