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# Councils of contentment: Works councils and income perceptions <sup>\*</sup>

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## Abstract

Using data from the German Socio-Economic Panel, we provide a comprehensive investigation of the relationship between workplace co-determination in the form of works councils and income satisfaction. Controlling for a wide range of individual, job-related, and firm-level characteristics in OLS and fixed effects specifications, we observe that employees working in establishments with a works council report significantly higher income satisfaction compared to their counterparts in non-co-determined firms. The rank in the income distribution, the perceived fairness of the wage, and working conditions emerge as quantitatively relevant factors in explaining the positive correlation.

*Keywords:* Co-determination, income satisfaction, SOEP.

*JEL classification:* I31, J28, J50.

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# 1 Introduction

Co-determination via works councils is a well-established and still widespread feature of the German labour market. Works councils have extensive information entitlements and, to a somewhat lesser extent, consultation and co-determination rights. The linkages between co-determination at the shop floor level and various economic indicators, such as productivity, wages, and profits, have been analysed extensively. Numerous studies suggest that works councils have positive effects on a range of outcomes, although causal relationships are difficult to establish (Jäger et al., 2022a). In contrast, the linkage between working in an establishment with a works council and worker-related outcomes other than wages has been studied much less intensively (Mohrenweiser, 2022, Jäger et al., 2022b). This remains the case even though information on indicators of, for example, employee well-being and job quality is often available. Therefore, the lack of analyses is not a data issue.

An important reason to study worker-related outcomes is that measures of, for example, employee well-being or (perceptions of) job quality may be more informative about the effects of co-determination than purely economic indicators such as wages or profits. At the very least, their analysis can provide valuable additional insights. First, if employees experience positive economic outcomes that at the same time have detrimental effects, the employees' subjective evaluation of these consequences can reveal the net impact of co-determination. Suppose that co-determination leads to higher wages and increased work demands, then the overall effect can be indicated by satisfaction measures, or behavioural indicators, such as absence rates or work commitment. Second, if strictly economic outcomes are not correlated with co-determination at the establishment level, suggesting the absence of effects, the analysis of worker-related outcomes can provide an alternative source of information on its beneficial or adverse welfare consequences. Third, worker-related outcomes may act as mediators in the relationship between co-determination and economic indicators, such as productivity, and can, thus, help explain observed patterns (Mohrenweiser, 2022).

In this paper, we investigate the relationship between working in a co-determined establishment and employees' income satisfaction. Several arguments suggest a linkage: First, employees in establishments with a works council may be paid differently than otherwise equivalent individuals working in non-co-determined firms. This can have an impact on income satisfaction via the level of pay, the resulting extent of income inequality, and the position in the income distribution. Second, works councils have co-determination rights concerning principal arrangements of pay determination and the introduction and application of new remuneration methods. Such influence on pay determination may shape how employees evaluate their income, if they, for example, regard its determination as transparent or plausible and its level as adequate or fair. Third, average tenure in co-

determined establishments is higher than in non-co-determined plants and works councils are associated with lower turnover. Therefore, a given remuneration today is more likely to predict future income in co-determined establishments. Such greater perceived certainty of wage payments may also have an impact on income satisfaction. Fourth, the type of tasks performed and the conditions under which they are carried out are likely to affect income satisfaction. If working conditions in co-determined establishments differ from those in plants without works councils, this may also affect how satisfied employees are with their income.

Previous studies on co-determination at the shop floor level and subjective employee-related outcomes have predominantly looked at job satisfaction. However, there is no consensus regarding the direction of the relationship ([Jirjahn and Tsertsvadze, 2006](#), [Grund and Schmitt, 2013](#), [Bellmann et al., 2019](#), [Goerke and Huang, 2022](#), [Mohrenweiser and Pfeifer, 2023](#), [Breuer et al., 2024](#)). One reason for these mixed findings may be differences in data sources, in samples, and in empirical specifications. Using a substantially larger panel sample from the SOEP than previously employed, we re-examine this relationship and find a positive association between works councils and job satisfaction. However, this relationship proves sensitive to specification choices. Furthermore, there are some studies examining fairness perceptions. [Pfeifer \(2014\)](#) uses SOEP data from 2011 to show that employees in co-determined firms are more likely to perceive their wages as fair compared to employees in establishments without a works council. [Mohrenweiser and Pfeifer \(2023\)](#), employing the 2012 and 2014 waves of the Linked Personnel Panel, however, observe no such correlation (see also [Mohrenweiser and Pfeifer \(2026\)](#)). Finally, [Addison and Teixeira \(2023\)](#) document a negative correlation between an indicator of being paid appropriately and worker representation at the firm level, based on two waves of the European Working Conditions Survey.<sup>1</sup>

An investigation of the linkage between co-determination at the establishment level via works councils and income satisfaction can be insightful for various reasons. First, pay is the most important compensation for the disutility of work. Accordingly, the satisfaction with the compensation can affect required pay levels. Second, the law establishing works councils states that their general task is to ensure that effect is given to acts, statutory instruments, safety regulations, collective agreements and agreements at the establishment level for the benefit of employees (see Works Constitution Act, § 80(1)). This implies that one of the main duties of works councils is to ensure that employees obtain their adequate pay. Third, we can gain a better understanding of the impact of co-determination on employees by focusing on arguably the most important facet of the employment relationship, that is, the employees' remuneration. Finally, while previous studies suggest

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<sup>1</sup> Worker representation includes the presence of a union or a works council. The published version of the paper ([Addison and Teixeira, 2025](#)) no longer contains the table with this result.

a relationship between co-determination and income satisfaction, none of them explicitly examines this linkage.<sup>2</sup>

In our study, we use data from the German Socio-Economic Panel (SOEP). Our results reveal a consistently positive and statistically significant association between the presence of a works council and income satisfaction, controlling for the income level and a wide range of individual, job-related, and firm-level characteristics. Fixed effects models confirm that the observed relationship is not driven by time-invariant unobservable individual heterogeneity. This indicates that potentially positive economic outcomes of co-determination go hand-in-hand with improvements in the perception of pay by employees, which extend beyond the enhancement due to the higher remuneration. Therefore, our findings suggest an additional benefit of co-determination, which has thus far been ignored. We further examine several potential mechanisms for the observed positive relationship. We find that differences in income rank, perceptions of wage fairness and working conditions play a quantitatively relevant role in explaining the positive correlation.

While our findings are specific to Germany, they are informative for industrial relations settings in other countries. First, we demonstrate the relevance of a particular labour market institution for income satisfaction. Other institutions and regulations, such as minimum wages and extension rules for collective agreements at the national level, or pay transparency requirements and employment protection laws, having an impact more directly at the establishment level, may also affect income satisfaction and, thus, deserve closer scrutiny. Second, our study contributes to the broader policy debate on whether to extend or establish shop floor representation of employees or co-determination in countries without such forms of employee involvement.

The remainder of the paper is structured as follows: Section 2 provides background information on the role of works councils in the German labour market. Section 3 describes in more detail the theoretical considerations that motivate our analysis. Section 4 introduces the data and outlines the empirical model. In Section 5, we present the results and discuss potential channels for the observed relationship. Section 6 concludes the paper.

## 2 Institutional background

Collective bargaining, mainly at the industry level, and co-determination at the plant or shop floor level are constituent elements of the industrial relations system in Germany (Heinze and Wolf, 2010, Heywood et al., 2010, Jäger et al., 2022a). In 2020, collective

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<sup>2</sup> As a partial exception, Breuer et al. (2024) consider the relationship between income satisfaction and a works council dummy interacted with the legally required share of the minority gender in the council, using data from the Linked Personnel Panel. They observe no correlation.

bargaining agreements covered 51% of employees, while works councils represented around 40% of private sector employees. These shares have declined from more than 70% coverage and 50% representation in the mid-1990s. The overlap between collective bargaining and works council representation is high, but by no means universal. In 2020, more than one in four employees who worked in a plant in which a works council existed was not covered by a collective bargaining agreement, while more than 35% of covered employees worked in a plant without a works council.<sup>3</sup> Personnel or staff councils are the public sector equivalent of private sector works councils. Most public sector employees are represented by such councils and simultaneously covered by a collective wage agreement ([Oberfichtner and Schnabel, 2019](#)).

The rights and obligations of works councils are laid down in the Works Constitution Act (WCA), originating from 1952. The law states in §1(1): *Works councils are elected in all establishments that normally have five or more permanent employees with voting rights.*<sup>4</sup> Although works councils are mandatory, they will only come into existence if elected by the workforce. If no such election takes place, this neglect of the law will not be sanctioned. Elections take place every four years between March 1 and May 31, most recently in 2026.

Works councils are legally obliged to cooperate with management to the advantage of the workforce and the establishment (WCA §2). To achieve this objective, the law endows works councils with information, consultation and co-determination rights, which become more extensive the larger the plant. The legal entitlements of works councils relating to personnel policy and social affairs are more widespread than with regard to financial and economic aspects. Concerning the remuneration of employees, the WCA states that a works council cannot negotiate the pay of employees with management if pay is usually or actually determined by a collective agreement, unless the applicable contract explicitly entitles works councils to do so (WCA §77(3)). The law also establishes co-determination rights concerning *the time and place for and the form of payment of remuneration* and relating to *principles of remuneration* (WCA §87(1)). Furthermore, employees who request an explanation of how their remuneration is calculated or an interview with the management to assess future career possibilities can ask to be accompanied by a works councillor (WCA §82(2)). In consequence, works councils can have at least an indirect impact on pay determination.

Co-determination entitlements, as laid down in WCA §87(1), also relate to aspects other than pay. Works councils, for example, can initiate guidelines or have to agree

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<sup>3</sup> See Tables 1, 7 and 9 in [Ellguth and Kohaut \(2021\)](#) for the numbers presented above.

<sup>4</sup> This translation and all subsequent ones are from a document made available by the Federal Ministry of Justice, available at: [https://www.gesetze-im-internet.de/englisch\\_betrvg/](https://www.gesetze-im-internet.de/englisch_betrvg/). For some recent expositions on the role of works councils and their effects, see, for example, [Jirjahn and Smith \(2018\)](#) and [Mohrenweiser \(2022\)](#).

to respective employer proposals regarding general regulations governing employee behaviour, working time and vacation arrangements (though not their respective durations), the use of devices monitoring employee behaviour and performance, occupational health and safety, principles of teamwork, and the design of remote work. These entitlements can give rise to better working conditions in co-determined establishments.

Furthermore, co-determination imposes restrictions on dismissals: *Any notice of dismissal that is given without consulting the works council is null and void* (WCA §102(1)). In addition, management has to brief the works council about its employment policy and discuss measures aimed at mitigating adverse consequences for employees resulting from employment changes (WCA §92). This set of obligations can enhance staff awareness of employment adjustments and mitigate the risk of a job loss in co-determined establishments.

The size of works councils, that is, the number of works councillors, increases with the number of employees (WCA §9). Basically, they continue to work in their job (WCA §37(2)). However, to enable them to perform their duties as councillors, their workload has to be reduced. If the establishment has 200 or more staff members, some works councillors are entitled to become full-time councillors and to be relieved from their standard job tasks. The number of full-time works councillors also increases with establishment size (WCA §38).

### 3 Expectations

In this section, we outline various reasons for an impact of co-determination on income satisfaction. To provide a conceptual framework, we interpret income satisfaction,  $IS_{it}$ , of individual  $i$  in year  $t$  as a function,  $f$ , of the wage,  $w_{it}$ , whether an individual works in a co-determined establishment ( $Co_{it}$ ), and a vector of other determinants, denoted by  $X_{it}$ :

$$IS_{it} = f(w_{it}, Co_{it}, X_{it}). \quad (1)$$

There are two categories of arguments for an impact of co-determination on income satisfaction. The first set of arguments relates to the level and certainty of pay, aspects concerning the income distribution, the manner in which pay is determined and the subjective evaluation of a given wage level. The second category encompasses aspects related to working environment.

The level of pay is likely to enhance income satisfaction directly, suggesting that  $\partial f / \partial w_{it} > 0$  holds. Moreover, empirical analyses generally find wages to be higher in co-determined firms (see Addison (2009), Jirjahn (2017), Mohrenweiser (2022), Schnabel (2020) and Jäger et al. (2022b) for surveys of the evidence). This could be a causal effect

if works councils manage to move employees into higher and better-paid occupational ranks. Alternatively, they may use their co-determination rights in areas other than pay to negotiate a wage rise in exchange for an agreement on, for example, overtime hours or productivity-enhancing alterations in the production process. The relationship could also reflect a simple correlation if co-determined firms systematically employ different types of individuals than establishments without works councils, and these differences are not fully captured in the vector of other determinants,  $X_{it}$ . But irrespective of why employees in co-determined establishments earn higher wages than comparable individuals working in plants without works councils, we expect that  $w_{it}(Co_{it})$  and  $\partial w_{it}/\partial Co_{it} > 0$  hold.

Labour income can also affect income satisfaction through an individual's position in the income distribution. For Germany, people in the same occupation or colleagues at the workplace appear to be an important reference groups (see, for example, [Goerke and Pannenberg \(2015\)](#)). Unfavourable income comparisons tend to lower job and life satisfaction, whereas realizing that one earns more than peers is often found to have a relatively small positive or no effect (see [Clark \(2017\)](#) for a survey with a host of references). As higher pay can translate into a better position in the income distribution, we may expect a positive impact of co-determination on income satisfaction. However, there are also studies documenting that individuals exhibit higher well-being if they earn less than relevant peers because their relatively low income today signals wage increases in the future (e.g., [Senik, 2004](#)). In this case, the relationship between income satisfaction and co-determination would be negative.

A further reason for why working in an establishment with a works council may affect satisfaction with income is that co-determination reduces pay inequality ([Heinze and Wolf, 2010](#), [Jirjahn and Smith, 2018](#), [Schnabel, 2020](#), [Jäger et al., 2022a](#)). Moreover, satisfaction with income increases with income equality ([Valet, 2023](#)). If such a relationship exists within firms, it can give rise to a positive effect of co-determination on income satisfaction. The impact of more pay equality is related to the effect of income comparisons but can arise in addition to or in the absence of considerations with regard to the pay of reference groups.

Additionally, satisfaction with current income is likely to vary with future earnings. For example, if the probability of remaining in the job is perceived as high, satisfaction with current income is arguably greater than when the future of the job is uncertain. In consequence, satisfaction with income can vary with the level of job security because the latter provides information about future earnings. Resignations and dismissals occur less often in establishments with a works council than in establishments without such institutions ([Hirsch et al., 2010](#), [Pfeifer, 2011](#), [Grund et al., 2016](#), [Gralla and Kraft, 2018](#), [Adam, 2019](#), [Fackler et al., 2024](#)). Therefore, if employees perceive their job to be more

secure in co-determined establishments, we can expect them to exhibit a higher level of satisfaction with a given level of income.

Furthermore, co-determination may affect the transparency of wage determination, as works councils have co-determination entitlements regarding pay principles. If works councils help individuals better understand the rationale behind their compensation, the greater transparency and plausibility of wage determination can enhance satisfaction with income. Furthermore, co-determination rights concerning pay principles may affect income satisfaction because this influence of a works council makes it more likely that employees regard their pay as an adequate or fair compensation for the work and effort they provide. A higher perceived fairness of pay is likely to enhance satisfaction with it.

Classifying the position in the income distribution, pay inequality, the stability of future earnings, and the transparency of pay determination as pay-related determinants of income satisfaction,  $Z_{it}^{Pay}$ , of individual  $i$  at time  $t$ , our above arguments suggest that  $Z_{it}^{Pay}(Co_{it})$  applies and  $IS_{it} = f(\dots, Z_{it}^{Pay})$  holds.

We additionally assume that works councils have an impact on income satisfaction via their effect on the working environment. We describe such effects by the variable  $Z_{it}^{Environ}$ . First, there are studies documenting that working conditions in co-determined establishments are better than or perceived to be superior to those in workplaces without a works council (Schnabel, 2020, Mohrenweiser, 2022). This feature may affect income satisfaction if it depends on how employees perceive the work they are paid for. In this case, income satisfaction will be higher for employees in co-determined establishments. Second, co-determination introduces and strengthens democratic elements in a hierarchical organisation and fosters workplace democracy (Jirjahn and Kiess, 2026). If employees in co-determined establishments perceive their workplace and decisions taken as more democratic, they are likely to be more satisfied with them. If this line of reasoning applies to pay as well, a positive effect of co-determination on income satisfaction will result. The above arguments relating to the working environment suggest that  $Z_{it}^{Environ}(Co_{it})$  and  $IS_{it} = f(\dots, Z_{it}^{Environ})$  apply.

Based on the above considerations, we can rewrite equation (1) as:

$$IS_{it} = f(w_{it}(Co_{it}), Co_{it}, X_{it}, Z_{it}^{Pay}(Co_{it}), Z_{it}^{Environ}(Co_{it})). \quad (2)$$

All in all, there are a number of arguments suggesting an impact of co-determination on income satisfaction. We conjecture that the positive effects dominate possible adverse consequences. Therefore, we subsequently test the following **hypothesis**:

*Individuals working in co-determined establishments exhibit a higher satisfaction with their own income than observationally equivalent employees working in plants without a works council.*

In terms of equation (2), the hypothesis implies  $df/dCo_{it} > 0$ . Moreover, we anticipate that a higher wage, positive pay-related effects and a good working environment raise income satisfaction, implying that  $\partial f/\partial w_{it}$ ,  $\partial f/\partial Z_{it}^{Pay}$ , and  $\partial f/\partial Z_{it}^{Environ} > 0$  hold. We further expect  $\partial w_{it}/\partial Co_{it}$ ,  $\partial Z_{it}^{Pay}/\partial Co_{it}$ , and  $\partial Z_{it}^{Environ}/\partial Co_{it} > 0$ . When we estimate the impact of co-determination on income satisfaction, the estimated coefficient is likely to become smaller in a specification in which the wage, pay-related effects and the working environment are accounted for, as the coefficient will no longer reflect effects operating through these channels. In terms of equation (2), we no longer approximate  $df/dCo_{it}$  when accounting for  $w_{it}$ ,  $Z_{it}^{Pay}$  and  $Z_{it}^{Environ}$ , but rather  $\partial f/\partial Co_{it}$ .

## 4 Data and empirical strategy

To estimate the correlation between income satisfaction and co-determination at the establishment level, we use data from the German Socio-Economic Panel (SOEP v39, 2022), a representative longitudinal study on households and individuals living in Germany. The survey has been conducted annually since 1984 (Goebel et al., 2019).

### 4.1 Variables

Our dependent variable,  $IS_{it}$ , stems from a question inquiring “*How satisfied are you today with the following areas of your life?*”. The answer category we focus on is “*Your personal income*”, which has been included in every wave since 2004. Possible answers range from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). In robustness analyses, we consider responses to the satisfaction question relating to other categories, such as household income, health, sleep, dwelling, leisure time, family life, social life, the job, and life in general.

With regard to our main dependent variable, the SOEP questionnaire does not provide guidance as to which components of income respondents should classify as personal income, i.e., whether non-labour income should be included. Since we focus on employees (see Section 4.2), labour earnings constitute the main income source for respondents in our sample. In fact, labour income accounts for, on average, 96.8% of total household pre-government income in our estimation sample, suggesting that the measure largely reflects satisfaction with earnings from work.

Our main independent variable,  $Co_{it}$ , is derived from the question “*Does a works or personnel council exist at your place of work?*”, with the possible answers “*Yes*” and “*No*”. This question has been included in the SOEP questionnaires at irregular intervals. During the period for which the information on income satisfaction is available, it has

been asked in 2006, 2011, 2016, 2019, and 2022. For simplicity, we use the term *works council* to refer to such an institution in both the private and the public sector.

We include the natural logarithm of net monthly income in our empirical specifications as a covariate, approximating  $w_{it}$  in equation (2). The further covariates,  $X_{it}$ , can be broadly divided into demographic controls and labour market- and firm-related variables. The former include dummy variables for being a female respondent, single, divorced, or widowed (with being married as reference category), a variable describing the respondent's age (and age squared), and a categorical measure of migration status.<sup>5</sup> Additionally, we include information on years of education and on the number of children in the household.

The second set of independent variables includes dummies for having a permanent contract, working part-time, being employed in the public sector, being a blue-collar worker or a civil servant (with being a white-collar employee as reference category), being an apprentice, and whether a job change occurred since the start of the previous calendar year. Furthermore, we include information about actual weekly working hours, years of tenure (and tenure squared), and three firm size dummies (with the smallest category of 5 to 19 employees as reference). Moreover, we incorporate dummies differentiating ten occupations, ten industries, 16 federal states of residence, and years of observation.

In some robustness analyses, we utilise further control variables. Moreover, when accounting for the channels via which co-determination can affect income satisfaction, we include empirical proxies for  $Z_{it}^{Pay}$  and  $Z_{it}^{Environ}$ . We will introduce the relevant variables when we motivate the additional estimations.

## 4.2 Estimation sample

We consider individuals who are employed full-time or part-time and between 16 and 67 years of age. We exclude self-employed individuals from our sample, as well as observations working in establishments with fewer than five employees, since the law on works councils applies to firms exceeding this size threshold. Moreover, we drop all observations with missing values. When focusing on the waves in which our main variables are available, i.e., 2006, 2011, 2016, 2019 and 2022, we obtain a sample of 42,158 observations from 24,344 individuals, of which 13,346 are observed only once. Some of the additional control variables we employ in extended specifications are unavailable in certain SOEP waves. Consequently, these estimations are based on fewer observations than the main estimates.

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<sup>5</sup> Migration status is further differentiated into direct migrants who migrated to Germany themselves, indirect migrants who were born in Germany and have parents who came from abroad, and a reference group of individuals without any migration background.

### 4.3 Estimation approach

To examine the relationship between working in a co-determined establishment and employees' satisfaction with their income, we specify the following model:

$$IS_{it} = \beta_0 + \beta_1 Co_{it} + \beta_2 w_{it} + \beta_3 \mathbf{X}_{it} + \lambda_t + \lambda_i + \epsilon_{it}. \quad (3)$$

The variable  $IS_{it}$  describes income satisfaction of individual  $i$  in year  $t$ .  $Co_{it}$  equals one if the respondent works in a co-determined establishment, and zero otherwise. Therefore,  $\beta_1$  is our main coefficient of interest.  $w_{it}$  describes the natural logarithm of net monthly income. The vector  $\mathbf{X}_{it}$  contains the demographic and job-related control variables, as described in Section 4.1. We also include year fixed effects, denoted by  $\lambda_t$ . When we estimate equation (3) using OLS on repeated cross-sections, we omit the individual fixed effect ( $\lambda_i$ ). Standard errors are clustered at the individual level.

The vector,  $\mathbf{X}_{it}$ , does not include variables that measure the impact of co-determination on pay-related outcomes and the work environment,  $Z_{it}^{Pay}$  and  $Z_{it}^{Environ}$ . In consequence, the estimated coefficient  $\beta_1$  incorporates the entire impact of co-determination, after controlling for wages. To account for the channels by which co-determination can affect income satisfaction, we also estimate an extended specification by including variables that approximate the channels:

$$IS_{it} = \beta_0 + \beta_1 Co_{it} + \beta_2 w_{it} + \beta_3 \mathbf{X}_{it} + \beta_4 Z_{it}^c + \lambda_t + \lambda_i + \epsilon_{it}, \quad (4)$$

with  $c = \{Pay, Environ\}$ . The direction and magnitude of the change in the estimated coefficient  $\beta_1$ , when comparing the results from estimating equations (3) and (4), will provide information on the role of the proposed channels via which works councils affect income satisfaction.

## 5 Results

### 5.1 Descriptive statistics

We report summary statistics in Table 1. In our main estimating sample, 63.4% of observations work in firms with a works council. In the private sector, the respective percentage equals 52.1%.<sup>6</sup> Therefore, there is a substantial gap in the presence of works councils in the private and public sector. While 41.7% of observations employed in establishments

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<sup>6</sup> Note that employees in firms with fewer than five employees are excluded from the sample. As a result, the share of observations working in a co-determined establishment is higher than the number reported in Section 2.

with a works council work in the public sector, just 7.3% of observations employed in establishments without a works council work in that sector. The table also indicates that the presence of a works council is more likely in larger firms.

Table 1 around here

Table 1 further shows that the income satisfaction level of respondents working in co-determined establishments exceeds that of employees in establishments without works councils by about 0.673 points. This is a sizeable difference given a mean satisfaction level of 6.779. When examining the distribution of the income satisfaction variable, Figure A.1 in Appendix A shows that individuals employed in co-determined establishments are more likely to report high levels of income satisfaction (particularly selecting responses between 8 and 10) and less likely to express low satisfaction levels compared to individuals in establishments without a works council.

## 5.2 Main results

Table 2 reports our main findings for OLS and fixed effects (FE) models. Across specifications, we consistently find positive and statistically highly significant correlations between the presence of a works council and employees' income satisfaction.<sup>7</sup> In the OLS models, the estimated coefficients decrease substantially when demographic and labour market controls are incorporated, which include information about a respondent's occupation. The respective decline is much less pronounced in the FE specifications. Adding industry information has little impact on the magnitudes of the estimated coefficients.

Table 2 around here

Employees in co-determined establishments differ from those in firms without a works council in several observable characteristics, such as firm tenure, job mobility, sector of employment (public vs. private), firm size, and even industry. Because the FE specifications account for time-invariant unobservable individual characteristics, we base our interpretation primarily on column (8) of Table 2, which is our preferred specification. Focusing on this specification, the income satisfaction of employees in co-determined establishments is 0.215 points higher than that of employees in non-co-determined establishments.

There might be concerns that employees who are dissatisfied with their income respond by setting up a works council or by moving to a co-determined establishment.

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<sup>7</sup> Table A.1 in Appendix A provides the full regression results, including coefficients on all control variables (except for year, state, occupation, and industry fixed effects).

The positive estimated coefficient for the works council dummy in the FE specification, however, is not compatible with such a sequence of events. Unfortunately, our data does not allow us to explicitly test whether dissatisfaction with income predates working in a co-determined establishments, since the information on works council presence is only available at multi-year intervals. This data structure prevents us from implementing a clean event-study design. Nevertheless, we can examine whether income satisfaction in earlier periods predicts the subsequent presence of a works council. To do so, we restrict our sample to individuals who either remain in an establishment without a works council between two survey years with available information (e.g., 2006–2011, 2011–2016, 2016–2019, and 2019–2022) or experience a change in works council status from being absent to being present at the place of work of the respondent during either of these intervals. Income satisfaction is measured in 2006, 2011, 2016, and 2019, respectively, while the covariates are measured in 2011, 2016, 2019, and 2022. We then regress a dummy variable indicating whether a change in the works council status occurred between two waves on the indicator of income satisfaction at the beginning of the interval. Table A.2 in Appendix A shows that the coefficients on lagged income satisfaction are small and statistically insignificant. Therefore, these findings provide no indication that income satisfaction in earlier years systematically predicts the subsequent presence of a works council.

A further concern relating to the results depicted in Table 2 could be that the findings may hide differences between different groups of employees. To explore this issue, we separate the sample according to gender, age, education, working hours, sector (public vs. private), occupation (blue-collar vs. white-collar), and region (eastern vs. western Germany). In addition, we examine heterogeneity by establishment size, as it plays a distinct role in the German institutional framework. We therefore report results using two alternative cutoffs, distinguishing establishments with fewer and more than 2,000 employees to capture differences associated with large-scale enterprises that are typically almost universally covered by collective bargaining agreements, and establishments with fewer and more than 200 employees to reflect the legal threshold at which works councilors are entitled to full release from regular duties (see Section 2). The estimated coefficients for working in a co-determined establishments are always positive (see Figure A.2 in Appendix A). Overall, there is no indication that the positive relationship between income satisfaction and co-determination is restricted to specific groups of employees.

### 5.3 Robustness

In this section, we summarize the results from several additional tests to verify the robustness of our findings.

**Omitted variables.** Income satisfaction may be affected by job-related and individual characteristics that are also correlated with the likelihood of working in a co-determined establishment. Hence, we investigate whether the observed positive correlation still holds when additional factors are accounted for. Potential omitted variables related to the job include collective bargaining coverage and differences in working hours, while relevant individual factors may be risk attitudes and personality traits.

Individuals employed in firms covered by a collective wage agreement are more likely to work in co-determined establishments than in those without a works council (Ellguth and Kohaut, 2021). Moreover, collective bargaining is likely to have direct effects on wages and the remuneration structure. Therefore, the estimated correlation between income satisfaction and co-determination may be biased if collective bargaining coverage is not accounted for. Since data on bargaining coverage and works councils at the workplace is available simultaneously solely for 2016 and 2019, we re-estimate equation (3) for these years, additionally including information about collective bargaining coverage.

If individuals work overtime, both the occurrence and the number of overtime hours may affect their satisfaction with income. In addition, overtime use in co-determined establishments differs from its extent in plants without works councils, although the direction of the correlation is disputed (see Schank and Schnabel (2004), Jirjahn (2008), Kraft and Lang (2008) and Gralla et al. (2017)). Data on the use of overtime and the number of weekly overtime hours is available in all SOEP waves used to estimate equation (3). However, a substantial number of individuals do not provide this information.

Table A.3 in Appendix A depicts the results from re-estimating equation (3) using the samples for which we have information on the additional control variables, covering both OLS and FE specifications in columns (1), (3), and (6). Focusing on the FE specifications, Panel B of Table A.3 shows that the estimated coefficients on the works council dummy for the different samples are comparable in significance to and of slightly greater magnitude than the one reported in our preferred baseline specification (column (8) of Table 2). Column (2) of Panel B further indicates that collective bargaining is not significantly associated with income satisfaction. The two overtime indicators are negatively correlated with income satisfaction (see columns (4) and (5)), implying that extra working hours may not be fully compensated financially. Importantly, including any of these additional variables hardly changes the estimated coefficient on the works council dummy. Finally, when we jointly include information on collective bargaining and overtime work, the estimated works council coefficient changes only marginally (see columns (6) to (8) in Panel B in Table A.3).

Turning to individual characteristics, there is evidence that personality traits and risk attitudes are associated with income satisfaction (see, for example, Shaw et al. (1999), C. Shrader and Singer (2014), Kang and Malvaso (2023) for findings from the US, the

UK, and China). If working in a co-determined establishment is systematically related to personality traits or risk attitudes, as also conjectured by [Jirjahn and Lange \(2015\)](#), the works council dummy in equation (3) may not describe the pure co-determination effect. To account for this possibility, we additionally include indicators of personality and risk attitudes in the model specified in equation (3). Data on personality traits, as measured by the Big Five, is available in the SOEP together with information on income satisfaction and works councils in 2019. Therefore, we restrict our analysis of personality traits to this year and report results for an OLS specification. The risk variable, which ranges from 0 (risk-averse) to 10 (risk-seeking), is available in all waves used for our baseline estimation. Hence, we provide the results from both OLS and FE models.

Table A.4 in Appendix A depicts the results from re-estimating equation (3) for the samples with information on the Big Five personality traits and on risk attitudes in columns (1), (3), (5), and (7). The even-numbered columns present the results after additionally including individual characteristics in the regression model. Risk attitudes and the Big Five traits, with the exception of neuroticism, are positively associated with income satisfaction. Comparing the estimated coefficients in even-numbered columns with those in the odd-numbered columns reveals that incorporating information on personality traits and risk attitudes does not alter the relationship between income satisfaction and co-determination. The results remain similar, when we jointly include information on personality traits and risk attitudes from the 2019 survey wave (see columns (7) and (8) in Table A.4).

Taking the insights from Tables A.3 and A.4 together, we find no indication that our baseline estimates in Table 2 are substantially affected by omitted variable bias.

**Alternative specifications.** To assess the relationship between co-determination and income satisfaction, we have so far relied on a continuous measure of income satisfaction. In Table A.5 in Appendix A, we document positive correlations for various binary indicators of income satisfaction. While we have estimated linear OLS and FE specifications so far, Table A.6 in Appendix A shows that our findings continue to hold if we use an ordered probit model. In addition, the results indicate that working in a co-determined firm is associated with a lower likelihood of expressing low or moderate levels of income satisfaction (0 to 7) and a higher probability of reporting high satisfaction levels (8 to 10).

**Sample selection.** Our income satisfaction measure may also reflect income from non-labour sources, which could bias our results if such income plays an important role for a subset of households. As an additional robustness check, we therefore examine whether our findings are sensitive to the presence of non-labour income. Although labour income constitutes, on average, 96.8% of total household income in our estimation sample, we

further restrict the sample to observations in which labour income accounts for the vast majority of total household income. In the specifications reported in column (1) of Table A.7 in Appendix A, we exclude individuals whose household labour income accounts for less than 85% of total household income. Total household income includes income from labour, assets, such as interest, dividends, and rental income, as well as private transfers from individuals outside the household, including alimony and child support payments. In column (2), we tighten this restriction to 90%, and in column (3) to 95%. The results, reported in Table A.7, remain very similar to the baseline estimates, indicating that our findings are not driven by households with substantial non-labour income.

Another concern regarding the FE estimates is that the identification relies on individuals who remain in the same firm and experience either the introduction of a works council or its abolition, and those who switch to a firm with a different works council status. The fixed effects estimates might be driven by job movers, which raises the concern that the estimated relationship partly captures factors associated with establishment mobility rather than changes in works council status per se. To account for the immediate effects of establishment mobility, we control for whether an individual experienced a job change in the previous year in all specifications. Nevertheless, we cannot fully rule out that works council status changes coincide with job changes that occurred further in the past because the year of the former change is not observable in our data.

Therefore, as a further robustness analysis, we restrict the sample to individuals who experience a change in works council status during the observation period. Individuals without any change in works council status are excluded, as they do not contribute to the FE estimates we focus on. We also omit individuals who experience multiple status changes, as they constitute only a small share of the sample. We identify establishment mobility using information on tenure. Dropping observations with no information on tenure, our resulting sample consists of 1,102 individuals who change employers when the works council status changes and 763 individuals who remain in the same firm when the council status varies. We first estimate our baseline specification using the restricted sample and then re-estimate it separately for respondents who change their employer and those who do not. The results are reported in Table A.8 in Appendix A. We find that the FE estimates are substantially larger for individuals who do not change their employer. This indicates that the FE estimates reported in Table 2 are not primarily driven by establishment mobility.

**Other satisfaction measures.** Our main results are consistent with the hypothesis we postulated, as they provide robust evidence of a positive correlation between working in a co-determined establishment and satisfaction with one's own income. However, we may obtain similar estimation results for the linkage between income satisfaction and

co-determination as documented in Table 2 if individuals working in establishments with a works council are not only more satisfied with their income but exhibit a higher level of satisfaction in general and are, therefore, more satisfied with a variety of aspects of life. In this case, the estimated coefficient in the specification described by equation (3) would not be informative about income satisfaction, if this satisfaction indicator moved in tandem with indicators relating to satisfaction with other life domains.

To explore this possibility, we re-estimate equation (3), using indicators of satisfaction with aspects not directly related to one’s job, such as health, sleep, housing, leisure time, family life, social life, and a measure of overall life satisfaction as dependent variables. For these specifications, the estimated correlations are statistically insignificant (see columns (1) to (7) in Table A.9 in Appendix A). Therefore, there is no indication that working in a co-determined establishment is associated with a broad impact on satisfaction. Moreover, the findings rule out the possibility that those individuals who are generally more satisfied with life or various facets of it sort into co-determined establishments.

Besides the above-mentioned satisfaction measures, we investigate two further job- and income-related outcomes. First, we consider satisfaction with one’s household income. In line with our main result, we observe a positive correlation between co-determination via works councils and satisfaction with household income. In the FE specification, the estimated coefficient is roughly half the size of that for satisfaction with personal income (see column (8) in Table A.9).

Moreover, we consider job satisfaction. This satisfaction measure is commonly used as a broad proxy for individuals’ utility from work. It captures both pay-related and pay-unrelated aspects of the employment relationship. Since works councils have extensive co-determination rights in areas such as working conditions or workplace organisation, it is plausible that works councils could also significantly affect job satisfaction.

The estimates indicate a positive relationship between job satisfaction and working in an establishment with a works council (see column (9) in Table A.9).<sup>8</sup> The positive association is consistent with Grund et al. (2024), who show that the adoption of management practices leads to a stronger increase in job satisfaction when a works council is present. However, repeating the robustness checks reported in Tables A.5 and A.6 for the relationship between co-determination and income satisfaction for specifications with job satisfaction as dependent variable, we observe that a positive linkage does not exist across all specifications, as documented in Tables B.1 and B.2 in Appendix B. These findings are

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<sup>8</sup> Figure B.1 in Appendix B illustrates that employees in co-determined establishments more often report higher levels of job satisfaction between 7 and 9 and fewer low or moderate satisfaction responses than employees in establishments without a works council. However, these differences are less pronounced than those observed for income satisfaction (see Figure A.1).

broadly consistent with results reported by [Grund and Schmitt \(2013\)](#), [Bellmann et al. \(2019\)](#), and [Goerke and Huang \(2022\)](#) based on a variety of SOEP samples. These authors document positive correlations between the presence of a works council and job satisfaction or the absence of a relationship. Using the 2001 SOEP wave, [Jirjahn and Tsertsvadze \(2006\)](#) even observe a negative relationship for some subgroups. These differences in findings concerning the relationship between co-determination and job satisfaction may arise because the respective studies employ different, usually much smaller samples than ours and often focus on other issues, such as union membership ([Goerke and Huang, 2022](#)) or training ([Bellmann et al., 2019](#)). Further studies, employing different data, such as from the Linked Personnel Panel (LPP), tend to find no correlation between co-determination and job satisfaction ([Bellmann et al., 2019](#), [Mohrenweiser and Pfeifer, 2023](#)).

The magnitude of the association between working in an establishment with a works council and job satisfaction reported in column (9) in [Table A.9](#) is much smaller than the estimates reported for income satisfaction in [Table 2](#). One possible explanation is that job satisfaction captures many different aspects of work. Positive effects may exist in some domains, whereas negative relationships may prevail in other contexts, as we document in the next section. If these opposite effects partially offset each other, we will observe a weaker correlation between co-determination and job satisfaction than with income satisfaction. Second, if the positive association between co-determination at the plant level and job satisfaction is weaker for some groups of employees than others, or even non-existent, whereas this is not the case for income satisfaction as the outcome, the aggregate impact of co-determination on job satisfaction is likely to be quantitatively smaller. For example, the comparison between [Figures A.2](#) and [B.2](#) shows that the existence of a works council is positively linked to income satisfaction among both blue-collar and white-collar workers, while a positive correlation with job satisfaction exists only for white-collar workers.

The various findings on the correlation between co-determination and job satisfaction (see [Appendix B](#)) suggest that the relationship between works councils and income satisfaction does not mainly reflect general improvements in job quality but rather captures pay-related mechanisms. We take up this issue in the next section.

## 5.4 Channels

In this sub-section, we seek to identify mechanisms which give rise to the observed positive relationship between working in a co-determined establishment and income satisfaction. We can consider five possible channels. First, co-determination alters an employee's position in the income distribution. Second, the perception of future earnings is different for individuals working in co-determined establishments than for employees in establish-

ments without co-determination at the plant level. Third, co-determination affects the transparency of the wage determination process. Fourth, co-determination alters the evaluation of a wage being an adequate or fair remuneration. All these channels are summarised in the variable  $Z_{it}^{Pay}(Co_{it})$  in equation (2). Fifth, the working environment varies with co-determination. This effect is captured by  $Z_{it}^{Environ}(Co_{it})$ . For each of the hypothesised mechanisms, we first outline the variable available in the SOEP we can employ to analyse the mechanism by which co-determination may impact income satisfaction. Second, we assess whether there is a correlation between the variable and co-determination, i.e. whether  $\partial Z_{it}^{Pay} / \partial Co_{it}$  and  $\partial Z_{it}^{Environ} / \partial Co_{it}$  are non-zero. Third, we re-estimate our baseline regression, as described by equation (3), using the sample for which data on the channel variable is available. Finally, we include the channel variable in the re-estimated baseline model, as specified in equation (4), and compare the estimated coefficients,  $\beta_1$ , for the works council dummy. This allows us to evaluate whether the proposed channel contributes to an explanation of the observed correlation between income satisfaction and co-determination.

**Position in income distribution.** Higher pay of individuals working in co-determined establishments can affect satisfaction with income because it alters the position in the income distribution. Given our individual-level data and the absence of information on the earnings of colleagues within the same establishment, we construct respondents' relative income positions at the level of the 1-digit industry. While this approach does not capture within-establishment comparisons, evidence suggests that workers in comparable jobs constitute an important reference group for income comparisons in Germany (Goerke and Pannenberg, 2015). More specifically, we construct a categorical variable for the income rank based on the quintiles of the net income within each industry-year group. This approach is based on the insight that an individual's rank within the income distribution is a better predictor of the well-being effects of relative income than comparing their own income with that of a reference group (Boyce et al., 2010). Since we have works council information in five survey years and consider up to ten 1-digit industries, we could have a maximum of 50 income distributions. However, due to variation in industry coverage across years, the actual number is 45.<sup>9</sup>

Table 3 around here

Table 3 reports a positive correlation between working in an establishment with a works council and the income rank in column (1), accounting for the (natural logarithm of) net

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<sup>9</sup> Three of the 45 distributions have fewer than 20 observations, which makes it difficult to generate a reliable income distribution. For the analysis of the effect of the position in the income distribution, we drop 29 observations from the sample who belong to these industry-year combinations.

income, suggesting that  $\partial Z_{it}^{Pay} / \partial C_{oit} > 0$  holds. Column (2) demonstrates a positive correlation between co-determination and income satisfaction for the slightly smaller sample. Adding information about the income rank clarifies that a higher position in the income distribution is positively correlated with income satisfaction. Moreover, the magnitude of the estimated coefficient for the works council dummy,  $\beta_1$ , in the FE specification in column (3) is about 14% lower if income rank is accounted for. This appears to be a sizeable effect, given that our indicator of an employee’s income rank is determined at the industry and not the establishment level. Accordingly, the findings are consistent with the conjecture that co-determination has a positive effect on satisfaction with income because it alters the position in the income distribution.

**Stability of future earnings.** Working in a co-determined establishment makes resignations and job terminations less likely and enhances job stability (see references in Section 3). This could affect satisfaction with income because it makes future earnings more stable. While there is no direct information about the evaluation of future earnings, the SOEP contains a question on perceived job security: “*How concerned are you about your job security?*”. Three answers are possible: “*Very concerned*”, “*Somewhat concerned*”, and “*Not concerned at all*”. To facilitate the interpretation of the results, we first construct a dummy variable that equals one if a respondent reports not being concerned about their job security, and zero otherwise.

Table 4 around here

Column (1) of Table 4 describes the relationship between co-determination and concerns about job security. The OLS results indicate that individuals working in a co-determined establishment are more concerned about their job security, while the estimated coefficient in the FE specification is not significantly different from zero. These findings are not in line with our expectations that employees in co-determined establishments view their jobs as more secure. One possible explanation for the observed correlation is that works councils must be consulted on future employment adjustments. This obligation could enhance the awareness of employees regarding future job losses. When we include the job security dummy in the baseline specification, the results in column (3) show that having no concerns about job security is associated with higher levels of income satisfaction. Moreover, the magnitude of the estimated coefficient for the works council dummy,  $\beta_1$ , increases in the OLS model, while it remains roughly unaffected in the FE specification. We obtain comparable findings when we include job security as an ordinal variable rather than as a dummy indicator, thereby exploiting information from all three response categories (1 = *very concerned*, 2 = *somewhat concerned*, and 3 = *not concerned at all*). The corresponding estimations are reported in columns (4) to (6) of Table 4. Based on

the FE model, therefore, we find no evidence that the perception of the stability of future earnings is a channel via which co-determination affects income satisfaction.

**Wage transparency.** If transparency of wage determination is higher in co-determined establishments, this may positively affect satisfaction with income. The SOEP does not contain a question, which we could directly use to test this potential channel. However, in the years 2011 and 2016 it provides information on performance appraisals. The survey item asks: “*Is your own performance regularly assessed by a superior as part of an agreed procedure?*” Possible answers are “*Yes*” and “*No*”. If a respondent answers “*Yes*”, they are subsequently asked: “*Does this performance assessment influence your monthly gross salary, a yearly bonus, future salary increases, or potential promotion?*” The feasible answers are “*Yes*”, “*No*”, and “*I do not know*”. From this information, we construct a dummy variable which equals one if the answers to both questions are affirmative. We interpret this dummy as an indication of a greater transparency of wage determination.

Table 5 contains the findings from the analysis of this potential channel. Since the number of observations in 2011 and 2016 is relatively large and these two years are not too far apart, we can estimate OLS and FE models.

Table 5 around here

Column (1) of Table 5 shows a significantly positive correlation between working in a co-determined establishment and our indicator of wage transparency in the OLS specification, while the relationship is not significant in the FE model.<sup>10</sup> Re-estimating equation (2) for the sample with information about performance appraisals (see column (2) in Table 5) indicates that the correlation is quantitatively somewhat stronger than for the main sample. Adding information about performance appraisals (see column (3)) hardly affects the magnitude of the estimated coefficients of the works council dummy,  $\beta_1$ . In consequence, we find no evidence that greater transparency of wage determination, proxied by a more pronounced use of performance appraisals, constitutes a channel by which co-determination increases income satisfaction.

**Wage fairness.** During the observation period, respondents were asked about the perceived fairness of their (net) income in odd years. Before and in 2015, the survey question was: “*Is the income that you earn at your current job just, from your point of view?*” The two possible answers were “*Yes*” and “*No*”. Individuals who answered “*No*” were further asked: “*How high would your net income have to be in order to be just?*” Since 2017,

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<sup>10</sup> Grund et al. (2020) report a positive correlation between co-determination and performance appraisals based on two waves of the German Linked Personnel Panel (LPP).

the respective question has been revised to: “*If you think about your current net income, would you say that it is just, considering the type of work you do, or that it is unjustly high or low?*” Answers can be provided on an eleven-point scale, ranging from “*unjustly low*” to “*unjustly high*”, with the midpoint indicating a perception of “*just*” compensation.<sup>11</sup> As before, individuals who perceive their wage as not just are asked to state the net income that they would regard as just. Using this information, we construct a binary variable capturing perceived income unfairness. Before 2017, the dummy variable equals one if respondents classify their wages as unjust and zero otherwise. From 2017 onward, the dummy variable equals one if respondents perceive their net income as unjustly low, and zero if they perceive it as just.<sup>12</sup>

Information on the existence of a works council at the place of work, income satisfaction, and perceived fairness of income is available in the SOEP in 2011 and 2019. Due to the eight-year gap, relatively few respondents appear in both waves and experience a change in the works council status. Consequently, Table 6 presents the results from OLS regressions using pooled data.

Table 6 around here

Employees working in co-determined establishments are less likely to perceive their wages as unfair than comparable employees in firms without a works council (see column (1), and Pfeifer (2014) for a comparable finding). This insight is consistent with the sign restriction  $\partial Z_{it}^{Pay} / \partial C_{oit} > 0$ . We re-estimate the baseline model using the restricted sample (see column (2)) and depict the findings when we include the indicator of wage unfairness in the regression model in column (3). Two findings emerge. First, greater unfairness perceptions are associated with lower income satisfaction. Second, the estimated coefficient on the works council dummy,  $\beta_1$ , declines by about 23% in magnitude.

By comparing the self-reported fair net income to the actual net income provided in the same wave, we are able to calculate the gap between the perceived fair wage and the actual wage.<sup>13</sup> When using this continuous measure instead of the unfair wage dummy in the estimations reported in Table 6, we obtain qualitatively similar results.<sup>14</sup>

To further explore the channel of wage fairness, we impute the works council information from 2006, 2016, and 2022 to 2005, 2007, 2015, 2017, and 2021 for individuals

<sup>11</sup> Unfortunately, it is not possible to distinguish whether respondents assessed income fairness based on their gross or net income before 2015.

<sup>12</sup> We code responses indicating that income is *unjustly high* as missing, which affects 1.3% of the sample.

<sup>13</sup> Constructing the unfair wage gap variable, we follow the approach of D’Ambrosio et al. (2018). First, we exclude individuals whose actual earnings exceed their self-reported fair earnings. Second, we top-trim the top 1% of the unfair wage gap distribution to account for likely reporting errors (e.g., one individual reports a monthly net income of €900 but a fair monthly income of €11,000).

<sup>14</sup> The results are available upon request.

who did not change employers.<sup>15</sup> This allows us to estimate FE models. The results for the dummy specification, presented in Table A.10 in Appendix A, are qualitatively and quantitatively comparable to the OLS findings depicted in Table 6.

In sum, the findings are consistent with the conjecture that co-determination has a positive effect on satisfaction with income because it alters the perceived fairness of the respondents' remuneration.

**Working conditions.** The final potential channel we examine concerns differences in working conditions between establishments with and without a works council. Co-determination at the plant level is often argued to improve working conditions (Jirjahn and Tsertsvadze, 2006, Grund and Schmitt, 2013, Bellmann et al., 2019, Mohrenweiser, 2022). First, works councils can act as a collective voice mechanism (Freeman and Medoff, 1984), aggregating and effectively communicating employees' preferences to management, which may in turn facilitate the provision of working environments better aligned with workers' needs. Moreover, co-determination may foster trust between management and employees. In an incomplete-contract setting, higher levels of trust can increase the likelihood that improvements in working conditions are implemented, as neither side expects the other party to opportunistically exploit such improvements.

At the same time, co-determination may also have adverse effects on working conditions or on their perception. By formalizing the employment relationship and introducing the works council as an additional decision-making body or entity that must be consulted or informed, co-determination may slow down or complicate the implementation of changes in working conditions. In addition, works councils may raise employees' awareness of adverse working conditions, potentially generating a negative association between co-determination and perceived working conditions (Jirjahn and Tsertsvadze, 2006, Grund and Schmitt, 2013).

Empirically assessing the role of working conditions faces limitations similar to those encountered in the analysis of wage transparency. The SOEP does not regularly provide indicators of working conditions that can be used to generate a consistent picture of the quality of work. While some measures, such as overtime, working hours mismatch, working time autonomy, and vacation use, are available, relying on these indicators often leads to substantial reductions in sample size or requires imputing works council information when the relevant questions are not included in all survey waves. Estimating our baseline specification separately for each of these indicators, using the maximum number of observations for which information on works councils and the respective working-condition measure is available in the same waves, shows that their inclusion does not materially af-

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<sup>15</sup> Figure A.3 in Appendix A illustrates the imputation approach.

fect the estimated works council coefficient. This suggests that no single observed aspect of working conditions mediates the relationship between co-determination and income satisfaction.

A comprehensive evaluation of working conditions that is continuously available in the SOEP is information about job satisfaction. Although job satisfaction is frequently used in the literature as a broad proxy for working conditions (Poggi, 2010, Raziq and Maulabakhsh, 2015), it also reflects pay-related aspects of the employment relationship and is therefore not well suited to isolating non-wage job characteristics.

To address this limitation, we adopt an indirect approach. We first estimate a regression of job satisfaction on income, a standard set of individual characteristics, and state and year FE, and then use the residual from this regression as a proxy for non-pay aspects of working conditions.<sup>16</sup> This residual captures variation in job satisfaction that cannot be explained by income or individual traits and is thus interpreted as reflecting working conditions and other non-wage job attributes.

Proceeding in the usual manner, we find a positive correlation between this residual-based measure of working conditions and working in a co-determined establishment in OLS and FE models (see column (1) in Table 7), indicating that  $\partial Z_{it}^{Environ} / \partial C_{oit} > 0$  applies. When including this measure of working conditions in our baseline specification for income satisfaction, the magnitude of the estimated works council coefficient in the FE specification decreases by about 12% (see column (3)). This suggests that differences in working conditions unrelated to pay account for part of the positive association between co-determination and income satisfaction.

Table 7 around here

**Combination of channels.** To sum up: The investigation of potential channels through which co-determination at the shop floor affects income satisfaction suggests that the position in the income distribution, perceived fairness of remuneration, and working conditions constitute the mechanisms through which co-determination affects income satisfaction. Information on the empirical proxies for these three mechanisms is available in the years 2011 and 2019 in the SOEP. If we add information on all three channels simultaneously to an OLS-regression with income satisfaction as dependent variable, the magnitude of the estimated coefficient of the works council dummy declines from 0.241 to 0.154 (see Table 8), i.e. by more than a third. Therefore, the three channels via which co-determination at the establishment level enhances satisfaction with own income explain only a part of the association. In terms of equation (2),  $\partial f / \partial C_{oit}$  remains positive, after having filtered

<sup>16</sup> Specifically, the set of individual characteristics correspond to those included in specifications (2) and (6) in Table 2.

out the impact of  $Z_{it}^{Pay}$  and  $Z_{it}^{Environ}$ .

Table 8 around here

**Differences between public and private sector.** We finally examine whether the relevance of the five potential channels differs between the private and public sector. Although the overall association between works councils and income satisfaction is similar across sectors, the mechanisms through which this relationship operates may differ due to distinct institutional environments. In particular, legal frameworks, the scope of co-determination rights, and wage-setting procedures are not fully identical in the two sectors. Figure A.4 in Appendix A, therefore, reports the estimated association between works councils, respectively, personnel councils and each potential channel separately for the private and public sector, focusing on the relationship between co-determination and the respective mediating variable.

The results reveal both similarities and differences across sectors. In line with our baseline findings, neither the perceived certainty of future earnings nor the transparency of wage determination (measured by performance appraisals) emerges as a relevant channel in either sector, as we do not observe a statistically significant association between works councils and these variables. By contrast, working conditions appear to constitute an important channel in both the private and public sector. Differences arise concerning unfair wage perceptions and the position in the income distribution. These channels are primarily relevant in the private sector, while we do not find comparable effects in the public sector. One plausible explanation is that wage-setting in the public sector is largely governed by standardized pay scales and collective agreements, which make earnings more transparent and compress wage dispersion. In such an environment, relative income rank and perceptions of unfair pay may be less salient or offer less scope for influence by personnel councils, the public sector equivalent of private sector works councils. In contrast, greater wage flexibility in the private sector may increase the relevance of these mechanisms.

## 6 Conclusion

Our study contributes to the growing literature on how workplace institutions influence employee well-being and examines the role of co-determination at the workplace for income satisfaction among employees in Germany. Using five waves of the SOEP and applying both OLS and FE specifications, we find robust evidence that individuals working in establishments with a works council report significantly higher satisfaction with their income compared to those in non-co-determined firms. Based on our main specification

including individual fixed effects, we find that working in an establishment with a works council is associated with a 0.215-point increase in income satisfaction. The positive association exists across various subgroups and hardly changes when we control for potential confounders such as collective bargaining coverage.

We further examine possible mechanisms behind this relationship. A higher position in the income distribution, a greater perceived fairness of the remuneration, and better working conditions emerge as quantitatively relevant factors in explaining the positive correlation between co-determination and income satisfaction. In contrast to our expectations, the perceived stability of future earnings and the transparency of the wage determination process do not substantially account for the observed relationship. Moreover, a substantial part of the observed relationship remains unexplained, suggesting that there are additional means by which co-determination affects satisfaction with income.

If co-determination increases income satisfaction, it could enhance the attractiveness of co-determined establishments as employers, help explain why employee tenure is substantially higher than in plants without works councils, and contribute to productivity differences that are unrelated to wage gaps between establishments with and without co-determination. Consequently, co-determination may benefit not only employees but also employers.

Causal evidence on the effects of shop floor co-determination is rare (Jäger et al., 2022a) because changes of the Works Constitution Act in the last two decades have not substantially altered the incentives of employees to establish works councils. Moreover, the firm size threshold to establish a works council has never been changed. Therefore, an exogenous change in coverage or in the incentives to set up a works council have not occurred. While our findings are thus correlational, several arguments suggest that the documented relationship is consistent with a meaningful role of co-determination. First, it seems unlikely that employees exhibiting high income satisfaction decide to establish a works council, which would imply reverse causality, given the overwhelming evidence that such a move is a defensive action that occurs primarily when establishments are in economically disadvantageous situations (Mohrenweiser, 2022). Second, we find no evidence of a relationship between other satisfaction indicators and working in a co-determined establishment, apart from satisfaction with one's job and household income. Accordingly, employees selecting to work in co-determined establishments are not generally more satisfied than workers in non-co-determined plants. Third, employment in a co-determined establishment may be correlated with unobservable features that are also linked to income satisfaction. Our analysis of the underlying mechanism, however, indicates that at least a part of the observed correlation is due to features of the employment relationship that works councils can affect, given the regulations of the Works Constitution Act. Taken

together, these findings point to a robust and systematic relationship between shop floor co-determination and income satisfaction.

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Table 1: Summary statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All observations				Works council	No works council	Difference in means
	Mean	S.D.	Min	Max	Mean	Mean	(5) – (6)
Income satisfaction	6.779	2.054	0	10	7.026	6.352	0.673***
Works council	0.634	0.482	0	1	1.000	0.000	
Female	0.493	0.500	0	1	0.484	0.509	-0.025***
Age	43.606	11.407	17	67	44.343	42.331	2.012***
Migration background: None	0.781	0.413	0	1	0.796	0.756	0.039***
Migration background: Direct	0.165	0.371	0	1	0.152	0.188	-0.036***
Migration background: Indirect	0.054	0.225	0	1	0.052	0.055	-0.003
Years of education	12.909	2.733	7	18	13.203	12.401	0.803***
Married	0.619	0.486	0	1	0.634	0.594	0.040***
Single	0.270	0.444	0	1	0.252	0.302	-0.050***
Divorced	0.097	0.296	0	1	0.100	0.092	0.009***
Widowed	0.014	0.116	0	1	0.014	0.013	0.001
Number of children	0.712	0.991	0	8	0.700	0.732	-0.032***
Firm tenure	11.200	10.531	0	50	13.115	7.890	5.226***
Ln net income	7.420	0.688	0	11	7.533	7.226	0.307***
Job change	0.163	0.369	0	1	0.142	0.199	-0.056***
Working hours	38.681	10.239	0	80	38.786	38.500	0.286***
Part-time	0.256	0.436	0	1	0.241	0.281	-0.040***
Permanent contract	0.872	0.334	0	1	0.876	0.865	0.010***
Public sector	0.291	0.454	0	1	0.417	0.073	0.344***
White-collar	0.688	0.463	0	1	0.684	0.695	-0.011**
Blue-collar	0.203	0.402	0	1	0.176	0.250	-0.074***
Apprentice	0.035	0.185	0	1	0.031	0.044	-0.013***
Civil servant	0.073	0.261	0	1	0.109	0.012	0.097***
Firm size $x < 20$	0.154	0.361	0	1	0.022	0.382	-0.360***
Firm size $20 \leq x < 200$	0.289	0.453	0	1	0.213	0.421	-0.209***
Firm size $200 \leq x < 2000$	0.247	0.431	0	1	0.321	0.119	0.202***
Firm size $x \geq 2000$	0.310	0.462	0	1	0.444	0.078	0.366***
Academic	0.223	0.416	0	1	0.263	0.155	0.108***
Auxiliary	0.058	0.234	0	1	0.049	0.073	-0.024***
Craftsmen and women	0.101	0.302	0	1	0.082	0.135	-0.053***
Farming, fishing, forestry	0.006	0.074	0	1	0.004	0.009	-0.006***
Management	0.055	0.228	0	1	0.054	0.057	-0.002
Mechanical	0.062	0.240	0	1	0.061	0.063	-0.002
Military	0.003	0.057	0	1	0.004	0.003	0.001*
Office and administration	0.115	0.319	0	1	0.117	0.112	0.005
Service and retail	0.104	0.305	0	1	0.076	0.152	-0.076***
Technician, comp. non-techn.	0.273	0.446	0	1	0.291	0.242	0.049***
Agriculture	0.009	0.096	0	1	0.005	0.017	-0.012***
Energy	0.008	0.087	0	1	0.011	0.003	0.008***
Mining	0.002	0.041	0	1	0.002	0.001	0.002***
Manufacturing	0.244	0.429	0	1	0.256	0.223	0.034***
Construction	0.042	0.200	0	1	0.020	0.080	-0.061***
Trade	0.117	0.321	0	1	0.072	0.194	-0.122***
Transport	0.044	0.204	0	1	0.047	0.037	0.010***
Bank/Insurance	0.041	0.199	0	1	0.057	0.014	0.042***
Services	0.415	0.493	0	1	0.423	0.400	0.023***
Other	0.080	0.271	0	1	0.108	0.031	0.076***
Observations		42158			26710	15448	

Notes: This table shows summary statistics of the main estimation sample. In columns (1)–(4), we show statistics for the whole sample, in column (5) for individuals working in firms with a works council, and in column (6) for individuals working in firms without a works council. Column (7) shows the difference in means between columns (5) and (6) and additionally indicates the statistical significance of the divergences. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table 2: Works councils and income satisfaction

<i>Dep. variable:</i>	Income satisfaction							
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) FE	(6) FE	(7) FE	(8) FE
Works council	0.691*** (0.025)	0.558*** (0.024)	0.242*** (0.030)	0.217*** (0.030)	0.265*** (0.045)	0.267*** (0.045)	0.224*** (0.046)	0.215*** (0.046)
State & year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Labour market controls	No	No	Yes	Yes	No	No	Yes	Yes
Industry controls	No	No	No	Yes	No	No	No	Yes
Observations				42158				
Individuals				24344				

Notes: Columns (1) to (4) show results from OLS regression, while columns (5) to (8) report estimates from linear FE regressions. Standard errors are clustered at the individual level and shown in parentheses. Table A.1 in Appendix A shows full regression results. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table 3: Income rank

<i>Dep. variable:</i>	Income rank		Income satisfaction	
	(1)	(2)	(3)	
<i>Panel A: OLS</i>				
Works council	0.095*** (0.011)	0.217*** (0.030)	0.180*** (0.030)	
Income rank			0.391*** (0.016)	
<i>Panel B: FE</i>				
Works council	0.087*** (0.017)	0.217*** (0.046)	0.186*** (0.046)	
Income rank			0.359*** (0.023)	
Observations		42129		
Individuals		24337		

Notes: Panel A shows results from OLS regressions, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years 2006, 2011, 2016, 2019, and 2022.

Table 4: Stability of future earnings

<i>Dep. variable:</i>	Job security: Not concerned		Income satisfaction		Job security: Ordinal measure		Income satisfaction	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: OLS</i>								
Works council	-0.036*** (0.007)	0.214*** (0.030)	0.239*** (0.029)	-0.056*** (0.010)	0.214*** (0.030)	0.247*** (0.029)		
Job security: Not concerned			0.688*** (0.022)					
Job security: Ordinal measure							0.587*** (0.018)	
<i>Panel B: FE</i>								
Works council	0.010 (0.012)	0.209*** (0.047)	0.206*** (0.047)	0.008 (0.016)	0.209*** (0.047)	0.206*** (0.046)		
Job security: Not concerned			0.283*** (0.030)					
Job security: Ordinal measure							0.273*** (0.025)	
Observations				41688				
Individuals				24190				

Notes: Panel A shows results from OLS regression, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table 5: Transparency of wage determination

<i>Dep. variable:</i>	Performance appraisal	Income satisfaction	
	(1)	(2)	(3)
<i>Panel A: OLS</i>			
Works council	0.082*** (0.009)	0.292*** (0.046)	0.280*** (0.046)
Performance appraisal			0.141*** (0.036)
<i>Panel B: FE</i>			
Works council	0.016 (0.028)	0.330*** (0.115)	0.327*** (0.115)
Performance appraisal			0.184** (0.078)
Observations		15632	
Individuals		12790	

Notes: Panel A shows results from OLS regression, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years: 2011 and 2016.

Table 6: Unfair wage perceptions

<i>Dep. variable:</i>	Unfair wage	Income satisfaction	
	(1)	(2)	(3)
Works council	-0.042*** (0.010)	0.248*** (0.043)	0.192*** (0.040)
Unfair wage (dummy)			-1.356*** (0.029)
Observations		17569	
Individuals		15306	

Notes: This table shows results from OLS regression. The set of covariates corresponds to specification (4) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years: 2011 and 2019.

Table 7: Working conditions

<i>Dep. variable:</i>	Working conditions	Income satisfaction	
	(1)	(2)	(3)
<i>Panel A: OLS</i>			
Works council	0.072** (0.029)	0.213*** (0.030)	0.183*** (0.026)
Working conditions			0.425*** (0.006)
<i>Panel B: FE</i>			
Works council	0.093* (0.049)	0.210*** (0.047)	0.185*** (0.044)
Working conditions			0.279*** (0.008)
Observations		41945	
Individuals		24241	

Notes: Panel A shows results from OLS regression, while Panel B reports estimates from linear FE regressions. The residual-based measure of working conditions is constructed as the residual from a regression of job satisfaction on income and individual characteristics and captures non-pay aspects of working conditions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years 2006, 2011, 2016, 2019, and 2022.

Table 8: Combination of channels

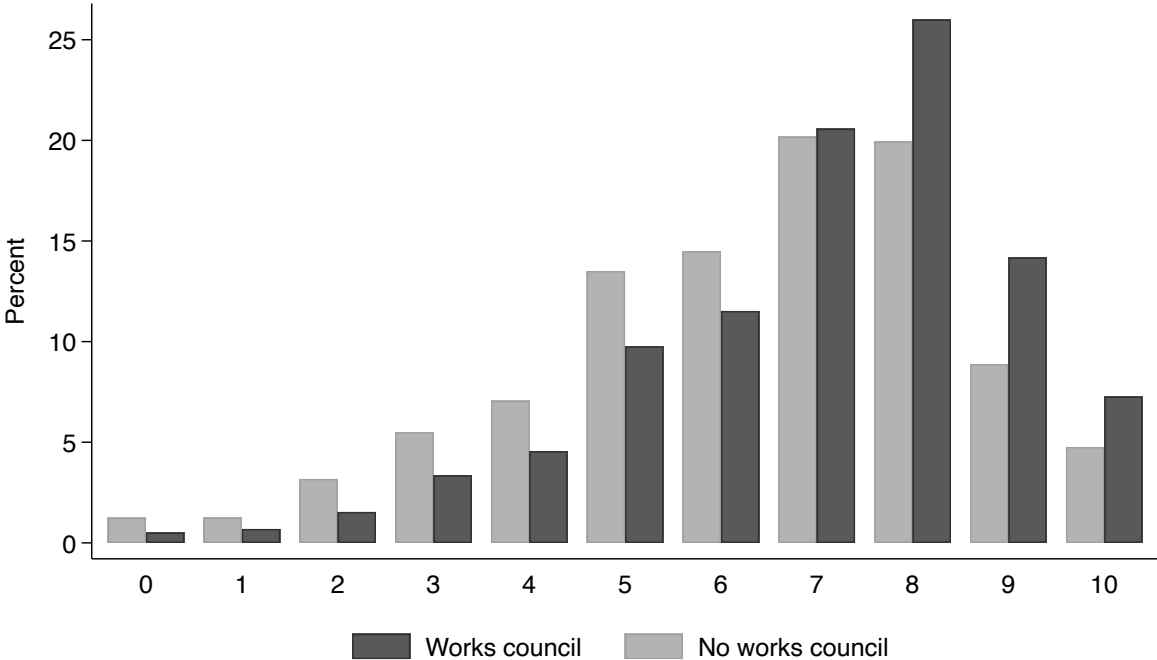
<i>Dep. variable:</i>	Income satisfaction	
	(1)	(2)
Works council	0.241*** (0.043)	0.154*** (0.036)
Income rank		0.270*** (0.022)
Unfair wage (dummy)		-1.037*** (0.027)
Working conditions		0.367*** (0.008)
Observations	17450	
Individuals	15209	

Notes: This table shows results from OLS regressions. The set of covariates corresponds to specification (4) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2011 and 2019.

# Appendix

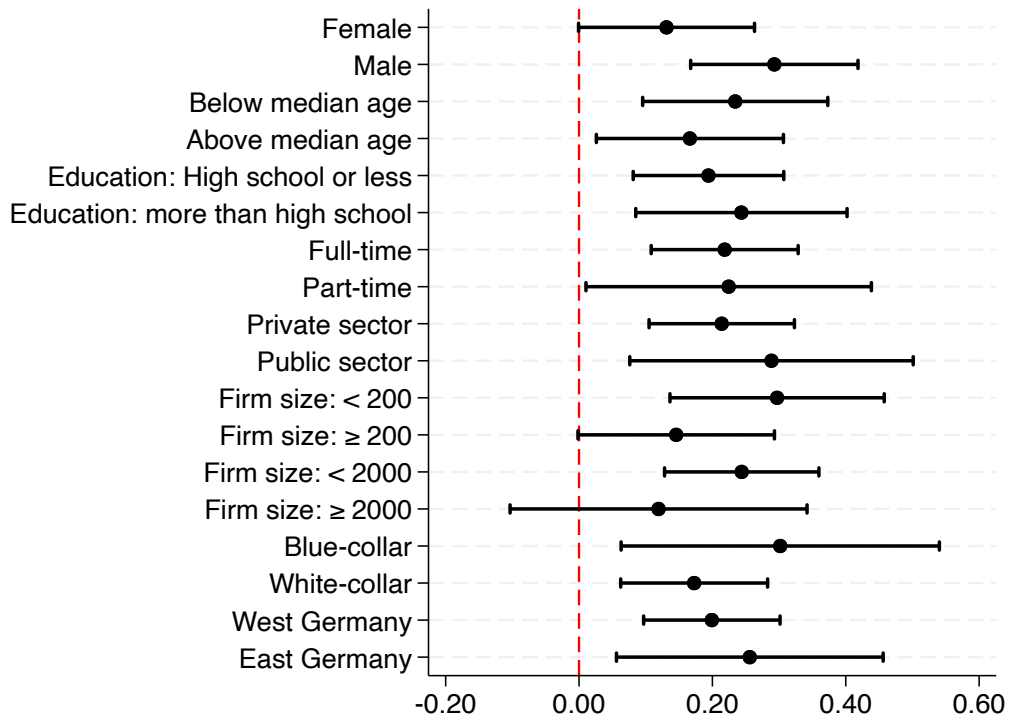
## A Additional Figures and Tables

Figure A.1: Distribution of income satisfaction



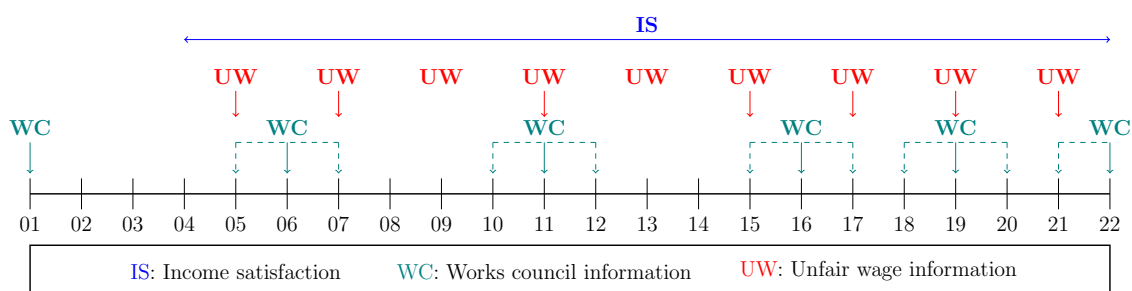
Notes: Data source: [SOEP v39 \(2022\)](#). Survey years: 2006, 2011, 2016, 2019, and 2022.

Figure A.2: Effect heterogeneity



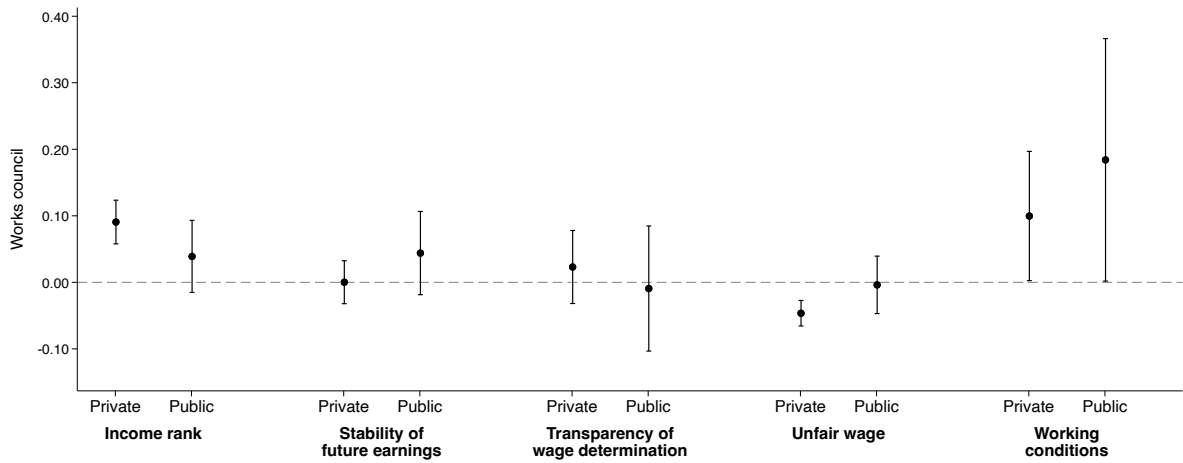
Notes: This figure shows the relationship between working in an establishment with a works council and income satisfaction across different subsamples. Each row is based on a separate linear FE regression containing the set of covariates used in specification (8) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. The confidence intervals shown are set at the 95 % level of statistical significance. Data source: SOEP v39 (2022). Survey years: 2006, 2011, 2016, 2019, and 2022.

Figure A.3: Imputation of works council information



Notes: Information on income satisfaction has been available every year since 2004. Without imputation, we only have information on works councils and perceptions of unfair pay in two waves, 2011 and 2019. To use more survey waves, we transfer the works council information from year  $t$  to  $t - 1$  and  $t + 1$ , marked by the dashed lines, and make sure that no job changes take place in the meantime.

Figure A.4: Channels: Private vs. public sector



Notes: This figure illustrates the relationship between the channel variables and employment in an establishment with a works council. Each row is based on a separate linear FE regression containing the set of covariates used in specification (8) in Table 2, except for the dummy variable indicating employment in the public sector. A complete list of these variables is provided in Table A.1 in Appendix A. The confidence intervals shown are set at the 90 % level of statistical significance. Data source: SOEP v39 (2022).

Table A.1: Works councils and income satisfaction: Full table

<i>Dep. variable:</i>	Income satisfaction							
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) FE	(6) FE	(7) FE	(8) FE
Works council	0.691*** (0.025)	0.558*** (0.024)	0.242*** (0.030)	0.217*** (0.030)	0.265*** (0.045)	0.267*** (0.045)	0.224*** (0.046)	0.215*** (0.046)
Female		-0.261*** (0.024)	0.099*** (0.028)	0.111*** (0.029)				
Age		-0.008 (0.008)	-0.076*** (0.009)	-0.075*** (0.009)		0.050*** (0.016)	-0.012 (0.018)	-0.011 (0.018)
Age <sup>2</sup>		0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)		-0.000 (0.000)	0.000** (0.000)	0.000** (0.000)
Migration background: Direct		-0.079** (0.034)	-0.076** (0.033)	-0.073** (0.033)				
Migration background: Indirect		-0.065 (0.053)	-0.022 (0.051)	-0.015 (0.051)				
Years of education		0.139*** (0.004)	0.032*** (0.006)	0.031*** (0.006)		0.083* (0.046)	-0.071 (0.049)	-0.072 (0.049)
Single		-0.175*** (0.036)	-0.117*** (0.033)	-0.114*** (0.033)		0.018 (0.076)	-0.018 (0.074)	-0.015 (0.074)
Divorced		-0.343*** (0.043)	-0.307*** (0.041)	-0.304*** (0.041)		0.029 (0.069)	0.007 (0.069)	0.006 (0.069)
Widowed		0.042 (0.098)	0.140 (0.092)	0.139 (0.092)		-0.154 (0.228)	-0.143 (0.224)	-0.152 (0.224)
Number of children		-0.035*** (0.013)	-0.009 (0.013)	-0.010 (0.013)		-0.061*** (0.023)	-0.023 (0.023)	-0.024 (0.023)
Firm tenure			0.014*** (0.004)	0.014*** (0.004)			-0.014** (0.006)	-0.014** (0.006)
Firm tenure <sup>2</sup>			-0.000 (0.000)	-0.000 (0.000)			-0.000 (0.000)	-0.000 (0.000)
Ln net income			0.874*** (0.043)	0.859*** (0.043)			0.507*** (0.054)	0.505*** (0.054)
Job change			0.034 (0.032)	0.034 (0.032)			0.116*** (0.043)	0.114*** (0.043)
Working hours			-0.014*** (0.002)	-0.013*** (0.002)			0.002 (0.002)	0.002 (0.002)
Part-time			-0.171*** (0.039)	-0.155*** (0.039)			-0.251*** (0.055)	-0.246*** (0.055)
Permanent contract			0.083** (0.039)	0.082** (0.039)			0.048 (0.061)	0.045 (0.061)
Public sector			-0.008 (0.029)	0.022 (0.032)			0.004 (0.055)	0.014 (0.055)
Blue-collar			-0.322*** (0.036)	-0.345*** (0.036)			-0.257*** (0.059)	-0.261*** (0.059)
Apprentice			-0.044 (0.086)	-0.052 (0.086)			-0.307* (0.158)	-0.307* (0.158)
Civil servant			0.244*** (0.045)	0.251*** (0.046)			-0.010 (0.192)	-0.022 (0.192)
Firm size 20 ≤ x < 200			-0.043 (0.036)	-0.051 (0.036)			0.067 (0.057)	0.064 (0.057)
Firm size 200 ≤ x < 2000			0.002 (0.041)	-0.011 (0.041)			0.111* (0.066)	0.103 (0.066)
Firm size x ≥ 2000			0.103** (0.042)	0.095** (0.042)			0.103 (0.068)	0.096 (0.068)
State & year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation controls	No	No	Yes	Yes	No	No	Yes	Yes
Industry controls	No	No	No	Yes	No	No	No	Yes
Observations					42158			
Individuals					24344			

Notes: Columns (1) to (4) show results from OLS regressions, while columns (5) to (8) report estimates from linear FE regressions. Omitted variables: Native, Married, Full-time, White-Collar, and Firm size <20. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table A.2: Works councils and previous income satisfaction

<i>Dep. variable:</i>	Works council	
	(1) OLS	(2) FE
Previous income satisfaction	-0.002 (0.002)	-0.001 (0.005)
Observations	5774	
Individuals	4109	

Notes: This table reports the estimation results from regressions of the works council dummy on lagged income satisfaction. The sample is restricted to individuals who remain in establishments without a works council between two survey years with available works council information, as well as those who experience a change in works council status (from 0 to 1) over this period. Column (1) shows results from the OLS regression, while column (2) reports estimates from the linear fixed effects regression. Additional covariates correspond to those used in specifications (4) and (8) in Table 2. A complete list of these covariates is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years: 2011, 2016, 2019, and 2022.

Table A.3: Robustness: Inclusion of further controls

<i>Dep. variable:</i>	Income satisfaction							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: OLS</i>								
Works council	0.199*** (0.041)	0.136*** (0.043)	0.231*** (0.031)	0.233*** (0.031)	0.231*** (0.031)	0.211*** (0.042)	0.143*** (0.044)	0.142*** (0.044)
Collective bargaining		0.183*** (0.035)					0.195*** (0.036)	0.195*** (0.036)
Overtime (0/1)				-0.105*** (0.024)			-0.040 (0.033)	
Overtime hours					0.001 (0.003)			0.001 (0.005)
<i>Panel B: FE</i>								
Works council	0.235*** (0.086)	0.219** (0.087)	0.235*** (0.048)	0.236*** (0.048)	0.236*** (0.048)	0.297*** (0.090)	0.277*** (0.091)	0.278*** (0.091)
Collective bargaining		0.088 (0.066)					0.105 (0.068)	0.107 (0.068)
Overtime (0/1)				-0.052* (0.031)			0.017 (0.053)	
Overtime hours					-0.011** (0.005)			-0.013 (0.010)
Observations	18909	18909	40074	40074	40074	18119	18119	18119
Individuals	13829	13829	23352	23352	23352	13321	13321	13321

Notes: Panel A shows results from OLS regressions, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Columns (1) and (2) and (6) to (8) use information from the survey years 2016 and 2019. Columns (3) to (5) use information from the survey years 2006, 2011, 2016, 2019, and 2022.

Table A.4: Robustness: Controlling for personality traits and risk attitudes

<i>Dep. variable:</i>	Income satisfaction							
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) FE	(6) FE	(7) OLS	(8) OLS
Works council	0.192*** (0.051)	0.173*** (0.051)	0.217*** (0.030)	0.218*** (0.030)	0.218*** (0.047)	0.218*** (0.047)	0.191*** (0.051)	0.172*** (0.051)
Big 5: Openess		0.080** (0.037)						0.058 (0.037)
Big 5: Conscientiousness		0.113*** (0.038)						0.111*** (0.038)
Big 5: Extraversion		0.158*** (0.037)						0.135*** (0.037)
Big 5: Agreeableness		0.161*** (0.036)						0.171*** (0.036)
Big 5: Neuroticism		-0.413*** (0.037)						-0.392*** (0.037)
Risk attitudes				0.052*** (0.005)		0.036*** (0.008)		0.041*** (0.009)
Observations	10640	10640	42096	42096	42096	42096	10634	10634
Individuals	10640	10640	24317	24317	24317	24317	10634	10634

Notes: Columns (1) to (4) and (7) to (8) show results from OLS regression, while columns (5) and (6) report estimates from linear FE regressions. The Big Five indicators are dummy variables that equal one if a respondent's score is above the median of the sample. The variable *risk attitudes* varies from 0 (risk-averse) to 10 (risk-seeking). The sets of additional covariates in columns (1) to (4), (7), and (8) correspond to specification (4) in Table 2, while the additional covariates in columns (5) and (6) correspond to specification (8) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Columns (1), (2), (7), and (8) use information from the survey year 2019, while columns (3) to (6) use information from the survey years 2006, 2011, 2016, 2019, and 2022.

Table A.5: Robustness: Alternative specification of the dependent variable

<i>Dep. variable:</i>	Dummy equal one if the income satisfaction level is at least			
	6 out of 10 (1)	7 out of 10 (2)	8 out of 10 (3)	9 out of 10 (4)
<i>Panel A: OLS</i>				
Works council	0.030*** (0.006)	0.047*** (0.007)	0.044*** (0.007)	0.018*** (0.005)
<i>Panel B: FE</i>				
Works council	0.023** (0.011)	0.038*** (0.012)	0.042*** (0.012)	0.032*** (0.010)
Observations	42158			
Individuals	24344			

Notes: Panel A shows results from OLS regressions, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years 2006, 2011, 2016, 2019, and 2022.

Table A.6: Robustness: Ordered probit model

<i>Dep. variable:</i>	Income satisfaction	
	(1) Coefficient	(2) Marginal effect
Works council	0.111*** (0.016)	
Income satisfaction = 0		-0.002*** (0.000)
Income satisfaction = 1		-0.002*** (0.000)
Income satisfaction = 2		-0.004*** (0.001)
Income satisfaction = 3		-0.007*** (0.001)
Income satisfaction = 4		-0.007*** (0.001)
Income satisfaction = 5		-0.010*** (0.001)
Income satisfaction = 6		-0.007*** (0.001)
Income satisfaction = 7		-0.001*** (0.000)
Income satisfaction = 8		0.013*** (0.002)
Income satisfaction = 9		0.014*** (0.002)
Income satisfaction = 10		0.013*** (0.002)
Observations	42158	
Individuals	24344	

Notes: Column (1) shows the coefficient of the works council dummy based on an ordered probit model, while column (2) reports the marginal effects for each income satisfaction level. The set of covariates corresponds to specification (4) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table A.7: Robustness: Sample restrictions

<i>Dep. variable:</i>	Income satisfaction		
	85% (1)	90% (2)	95% (3)
<i>Panel A: OLS</i>			
Works council	0.232*** (0.031)	0.233*** (0.031)	0.247*** (0.032)
<i>Panel B: FE</i>			
Works council	0.230*** (0.048)	0.238*** (0.049)	0.223*** (0.051)
Observations	39856	38533	35803
Individuals	23245	22707	21544

Notes: Panel A shows results from OLS regression, while Panel B reports estimates from linear FE regressions. In column (1), we exclude individuals whose household labour income accounts for less than 85% of total household income (including income from labour, financial assets, rents, etc.). In column (2), we tighten this restriction to 90%, and in column (3) to 95%. The set of covariates corresponds to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table A.8: Individuals with and without establishment mobility using FE specification

<i>Dep. variable:</i>	Income satisfaction		
	Both changers & non-changers (1)	Changers (2)	Non-changers (3)
Works council	0.194*** (0.057)	0.163* (0.089)	0.234*** (0.075)
Observations	4885	2922	1963
Individuals	1865	1102	763

Notes: This table shows results from linear FE regressions. The set of additional covariates corresponds to specification (8) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years 2006, 2011, 2016, 2019, and 2022.

Table A.9: Robustness: Other satisfaction measures

<i>Dep. variable:</i> Satisfaction with	Life (1)	Leisure (2)	Family life (3)	Social life (4)	Dwelling (5)	Sleep (6)	Health (7)	Household income (8)	Job (9)
<i>Panel A: OLS</i>									
Works council	0.008 (0.024)	0.009 (0.031)	-0.035 (0.027)	-0.024 (0.033)	-0.015 (0.027)	-0.024 (0.035)	-0.017 (0.029)	0.102*** (0.029)	0.072** (0.029)
<i>Panel B: FE</i>									
Works council	0.004 (0.034)	0.035 (0.050)	0.018 (0.043)	0.055 (0.062)	0.006 (0.045)	0.059 (0.055)	0.045 (0.043)	0.097** (0.044)	0.093* (0.049)
Observations	42144	42158	41826	24575	42127	34517	42189	41956	41945
Individuals	24345	24346	24205	17071	24321	20919	24356	24234	24241

Notes: Panels A shows results from OLS regressions, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Columns (1), (2), (3), (5), (7), (8), and (9) use information from the survey years 2006, 2011, 2016, 2019, and 2022. Column (4) uses information from the survey years 2006, 2011, and 2016. Column (6) uses information from the survey years 2011, 2016, 2019, and 2022.

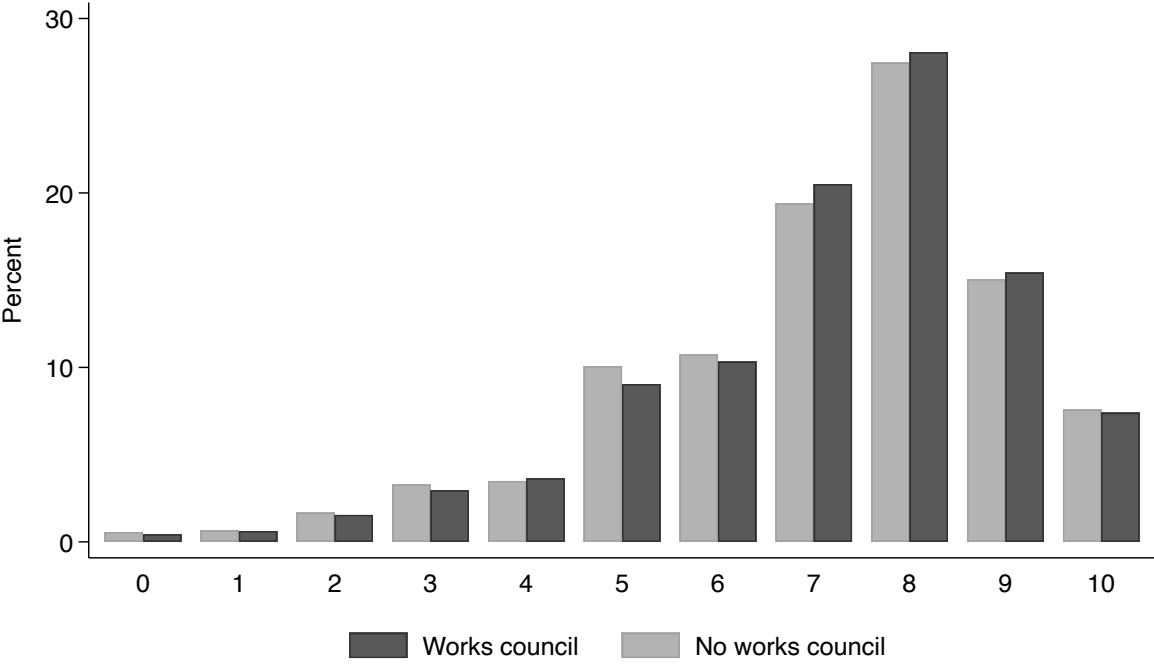
Table A.10: Works councils and unfair wage perceptions using FE specification

<i>Dep. variable:</i>	Unfair wage		Income satisfaction	
	(1)	(2)	(3)	
Works council (imputed)	-0.045*** (0.012)	0.230*** (0.044)	0.200*** (0.043)	
Unfair wage (dummy)			-0.669*** (0.022)	
Observations		50367		
Individuals		22094		

Notes: This table shows results from linear FE regressions. The work council information from 2006, 2016 and 2022 to 2005, 2007, 2015, 2017, and 2021 is imputed for individuals who did not change employers. Details on the imputation procedure are provided in Figure A.3. The set of covariates corresponds to specification (8) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2005, 2007, 2011, 2015, 2017, 2019, and 2021.

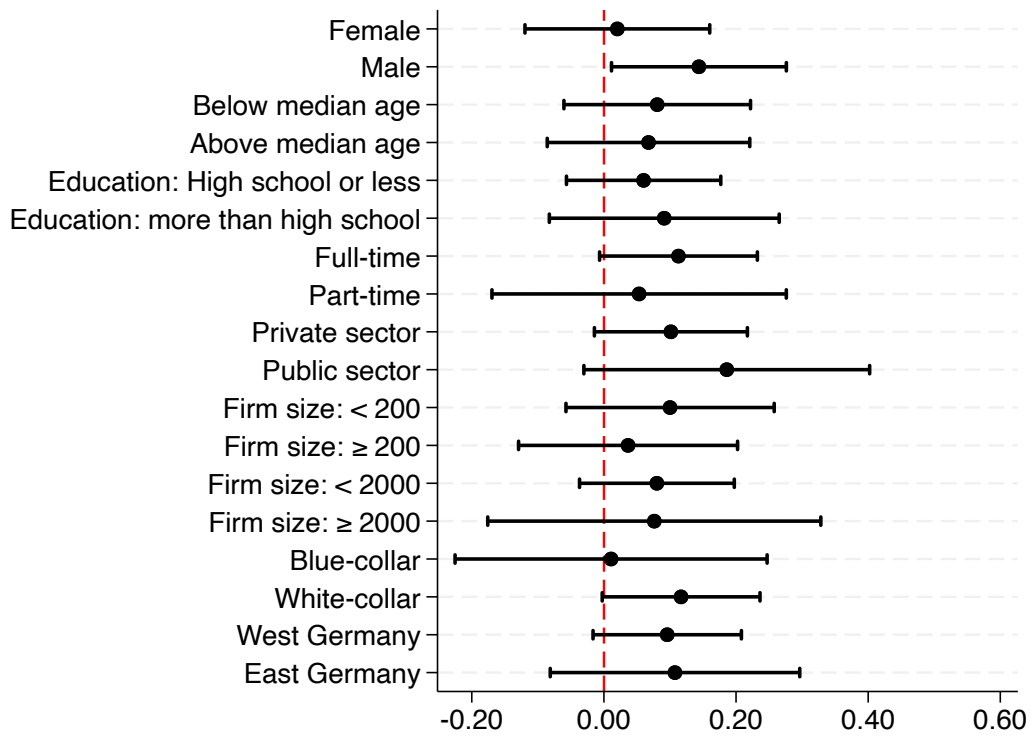
# B Robustness Tests for Job Satisfaction

Figure B.1: Distribution of job satisfaction



Notes: Data source: [SOEP v39 \(2022\)](#). Survey years: 2006, 2011, 2016, 2019, and 2022.

Figure B.2: Effect heterogeneity



Notes: This figure shows the relationship between working in an establishment with a works council and job satisfaction across different subsamples. Each row is based on a separate linear FE regression containing the set of covariates used in specification (8) in Table 2. A complete list of these variables is provided in Table A.1 in the Appendix. The confidence intervals shown are set at the 95 % level of statistical significance. Data source: [SOEP v39 \(2022\)](#). Survey years: 2006, 2011, 2016, 2019, and 2022.

Table B.1: Robustness: Alternative specification of the dependent variable

<i>Dep. variable:</i>	Dummy equal one if the job satisfaction level is at least			
	6 out of 10 (1)	7 out of 10 (2)	8 out of 10 (3)	9 out of 10 (4)
<i>Panel A: OLS</i>				
Works council	0.008 (0.006)	0.014** (0.007)	0.019*** (0.007)	0.013** (0.006)
<i>Panel B: FE</i>				
Works council	0.021* (0.011)	0.016 (0.012)	0.022* (0.013)	0.007 (0.011)
Observations	41945			
Individuals	24241			

Notes: Panel A shows results from OLS regressions, while Panel B reports estimates from linear FE regressions. The sets of additional covariates in Panels A and B correspond to specifications (4) and (8) in Table 2, respectively. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: [SOEP v39 \(2022\)](#). Survey years 2006, 2011, 2016, 2019, and 2022.

Table B.2: Robustness: Ordered probit model

<i>Dep. variable:</i>	Job satisfaction	
	(1) Coefficient	(2) Marginal effect
Works council	0.044*** (0.016)	
Job satisfaction = 0		-0.001*** (0.000)
Job satisfaction = 1		-0.001*** (0.000)
Job satisfaction = 2		-0.001*** (0.001)
Job satisfaction = 3		-0.002*** (0.001)
Job satisfaction = 4		-0.002*** (0.001)
Job satisfaction = 5		-0.004*** (0.002)
Job satisfaction = 6		-0.003*** (0.001)
Job satisfaction = 7		-0.002*** (0.001)
Job satisfaction = 8		0.004*** (0.002)
Job satisfaction = 9		0.007*** (0.002)
Job satisfaction = 10		0.006*** (0.002)
Observations	41945	
Individuals	24241	

Notes: Column (1) shows the coefficient of the works council dummy based on an ordered probit model, while column (2) reports the marginal effects for each job satisfaction level. The set of covariates corresponds to specification (4) in Table 2. A complete list of these variables is provided in Table A.1 in Appendix A. Standard errors are clustered at the individual level and shown in parentheses. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Data source: SOEP v39 (2022). Survey years: 2006, 2011, 2016, 2019, and 2022.

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