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Works Councils and Apprenticeship Training: Heterogeneous Works Councils, Heterogeneous Effects?

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ABSTRACT

In Germany, works councils possess co-determination rights concerning apprenticeship training, which may influence training outcomes in firms. While the literature commonly assumes homogeneous effects of works councils, this study reveals considerable heterogeneity in their involvement in training-related decisions. Using representative German firm-level data, we explore two dimensions of works councils' heterogeneity: their participation in various apprenticeship-related decisions and their overall perceived success in enforcing their agendas. We document how these dimensions of works council heterogeneity are associated with firms' decisions on whether to train apprentices, the intensity of training (the number of apprentices relative to total employment) and apprentice retention and dropout rates. Our findings indicate that works council participation is associated with higher training propensity and higher apprentice retention rates, but it has no significant link to training intensity. Interestingly, works councils rated as successful are associated with lower apprentice dropout rates but also lower retention rates for graduates, highlighting a trade-off between ensuring training quality and navigating the potentially conflicting interests of apprentices and incumbent workers.

1 | Introduction

Works councils, which represent employees' interests at the firm level, are a cornerstone of the German labour market. These institutions are vested with significant rights to participate in and oversee a range of firm decisions, including those related to apprenticeship training and the subsequent retention of apprentices. Existing empirical research has shown that firms with works councils tend to exhibit higher retention rates for apprentices (Koch et al. 2019; Kriechel et al. 2014). However, the majority of studies have focused solely on the presence or absence of a works council within a firm, largely overlooking the variation in how works councils operate. Recognizing that works councils differ substantially in their areas of activity and in their success at enforcing their agendas, this study contributes to the literature

by examining these two critical dimensions of heterogeneity and their association with firm-level apprenticeship decisions.

Apprenticeship training decisions warrant particular attention for at least two reasons. First, by engaging in apprenticeship training, firms not only address their own future skill needs but also contribute to the broader supply of skilled workers within the economy. Understanding the drivers behind firms' decisions to train apprentices is therefore essential for both research and policy. Second, in Germany, nearly 60% of young adults pursue vocational education through apprenticeships. For lower qualified school leavers who do not intend to pursue higher education, apprenticeships are crucial for gaining entry into the labour market and establishing a successful occupational career. Thus, analysing how works council heterogeneity is associated

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with firm-level decision-making on apprenticeship participation and retention is of paramount importance—particularly for educational policymakers in countries with well-established dual apprenticeship systems, such as Switzerland, Austria and Denmark (see OECD 2023).

Our analysis draws on unique firm-level data that provide comprehensive information on both works council heterogeneity and apprenticeship training outcomes. Utilizing the BIBB Establishment Panel on Training and Competence Development (BIBB-Training Panel), a representative dataset of German firms, we identify two key dimensions of works council heterogeneity: (1) their participation in apprenticeship-related decision-making processes and (2) their perceived success in enforcing their agenda.¹ While previous studies have explored works council heterogeneity in relation to outcomes such as turnover rates or environmental investments (Askildsen et al. 2006; Dilger 2002, 2006), the effects of this heterogeneity on apprenticeship training have yet to be empirically examined.

Our findings reveal substantial variation in the involvement of works councils in apprenticeship training decisions. Not all works councils participate in such decisions, and their success in enforcing agendas is far from uniform. This heterogeneity is associated with divergent training outcomes for firms. Specifically, works council participation is associated with a greater propensity for firms to engage in apprenticeship training, although it has no significant effect on the number of hired apprentices in relation to total employment. Works councils that actively participate in decision-making processes tend to foster higher retention rates among apprentices, whereas those that are deemed more successful in enforcing their agendas are linked to lower retention rates. Similar patterns are observed in apprenticeship dropout rates.

The remainder of this article is organized as follows. Section 2 outlines the institutional framework of works councils and apprenticeship training in Germany. Section 3 provides a theoretical framework, analyses how works council heterogeneity is associated with training outcomes, and derives empirically testable hypotheses. Section 4 reviews the literature on the relationship between works councils and apprenticeship training. Section 5 details the dataset and descriptive statistics. Section 6 describes the empirical model. Section 7 presents the results, examining the relationship between works council heterogeneity and our four key outcomes in the apprenticeship training process. Finally, Section 8 concludes with a discussion of the results and their implications for policy and future research.

2 | Institutional Framework of Works Councils and Apprenticeships

Germany's industrial relations system is characterized by a dual structure. At the industry level, collective agreements are negotiated between unions and employer associations through centralized social partnerships. At the establishment level, workers' interests are represented by works councils, which serve as a key institutional mechanism for employee representation (Jäger et al. 2022). Works councils can be established in firms with at least five employees, based on an initiative by the employees

themselves. Once formed, works councils are granted extensive information, consultation and codetermination rights under the Works Constitution Act (WCA).

Although works councils were present in only 8% of German firms in 2021, they covered 39% of employees in West Germany and 34% in East Germany (Ellguth and Kohaut 2022). Despite this relatively low firm-level coverage, works councils continue to be a vital institution for ensuring democratic participation in German workplaces. Over the years, interest in works councils and the functioning of this institution has been maintained or even revived, although their reach has diminished (Budde et al. 2024). Among their broad array of rights and responsibilities, works councils play a critical role in hiring decisions and in ensuring that apprentices receive appropriate training within firms.

Apprenticeship training occupies a central place in Germany's labour market and education system. The country's dual apprenticeship system relies heavily on firms, which serve as primary sites for the development of practical skills. In deciding whether to train apprentices and whom to train, firms effectively act as gatekeepers to skilled employment. Apprenticeship programmes allow firms to meet their firm-specific skill demands by cultivating and retaining future skilled employees. However, apprenticeship training also imposes significant costs. German firms typically incur a net training investment of about €17,000 (3-year) to €31,000 (3.5-year) per apprentice (Schönfeld et al. 2020). Firms nevertheless train because they can recoup this investment *ex post* by retaining the most productive graduates—by paying a skilled-worker wage that, while attractive to the employee, still lies below the worker's marginal productivity due to labour market frictions (Acemoglu and Pischke 1999; Dustmann and Schönberg 2009; Kriechel et al. 2014).

The apprenticeship market in Germany faces a persistent 'mismatch' phenomenon: Many firms struggle to find suitable apprentices for the positions they offer, whereas prospective apprentices often face difficulty securing placements in their desired occupations or regions. This mismatch has led to a decline in both the share of firms providing apprenticeship training—falling to 19.1% in 2021—and the overall number of apprentices (Mohr 2023). Such trends exacerbate existing and future skill shortages, posing a significant challenge to the labour market.

Given the extensive rights and responsibilities of works councils, as well as the crucial role apprenticeships play in the German labour market, several empirical studies have examined the influence of codetermination on apprenticeship training. These studies, discussed in detail below, explore how works councils shape firm-level training decisions and the broader apprenticeship system.

3 | Theoretical Framework and Hypotheses

Apprenticeship training is shaped by a network of stakeholders whose interests overlap but sometimes diverge. Management must secure a reliable pipeline of skills while weighing the immediate costs and long-term benefits of training. Incumbent workers (the 'insiders') value job security, high wages and pro-

tection from competition created by newly qualified graduates. Apprentices (the ‘outsiders’) seek high-quality instruction, fair treatment rather than exploitation as cheap labour, and realistic prospects of permanent employment once they complete their programme. Beyond the individual workplace, employer associations coordinate member firms, negotiate sector-level agreements and therefore have an interest in sustaining an adequate supply of skilled labour. Moreover, unions—through collective bargaining—help set wage floors that influence firms’ incentives to invest in training. Acting as the legal voice for employees (§ 2 BetrVG), works councils must mediate not only between management and the workforce but also navigate the positions staked out by unions and employer associations in collective bargaining. Variation in how effectively individual works councils balance these conflicting pressures produces a wide spectrum of apprenticeship outcomes.

Given the central role and statutory rights of works councils in German apprenticeship training outlined in Section 2, an important point of inquiry concerns how they specifically influence apprenticeship outcomes. Our study addresses this complexity by analysing two dimensions of works council heterogeneity: (1) their participation in specific apprenticeship-related decisions and (2) their overall success in enforcing their agenda within firms. We apply established theoretical perspectives to explain heterogeneous works council effects, combining insights from collective voice theory (Freeman and Medoff 1984), the theory of incomplete contracts (Kaufman and Levine 2000; Smith 1991) and insider–outsider theory (Lindbeck and Snower 2001) within a stakeholder and power framework (Freeman and Lazear 1995). This integration helps explain why works councils may engage differently with apprenticeship issues and how their varying levels of participation and success could generate different outcomes. The next section briefly discusses these theoretical approaches, leading to the formulation of three main hypotheses.

3.1 | Theoretical Mechanisms

We propose three interrelated mechanisms through which works councils influence apprenticeship training, with a fourth mechanism serving as a contextual factor:

3.1.1 | Collective Voice

Works councils can function as a ‘collective voice’ mechanism (Freeman 1980; Hirschman 1970), aggregating employee preferences and reducing information asymmetries between employees and management. Active participation in apprenticeship decisions signals that the works council engages with apprentice concerns and uses its consultation and information rights (§ 96, § 97 of BetrVG) regarding training quality, quantity and the conditions surrounding potential retention after training.

This voice function enables policies that better align with apprentice interests and enhances communication, making firms with works council involvement in apprenticeship matters more attractive to potential candidates. Consequently, these firms likely benefit from a larger pool of qualified applicants and conclude

more training contracts. On the basis of this reasoning, we derive our first hypothesis as follows:

H 1a. *Works-council participation in apprenticeship decisions is associated with a higher likelihood that a firm offers apprenticeship training.*

Furthermore, by fostering a better training environment and improving the match between apprentice expectations and firm realities, participatory works councils can increase apprentice satisfaction and mutual commitment, leading to higher acceptance rates among graduates who receive offers of permanent employment. We thus hypothesize:

H 1b. *Works-council participation in apprenticeship decisions is associated with a higher acceptance rate among graduates receiving an offer, raising overall retention.*

However, given that sustaining adequate training quality necessitates sufficient instructor engagement, participatory works councils may advocate for reduced cohort sizes to preserve quality standards. Thus, the aggregate effect on training intensity is theoretically indeterminate, leading to our next hypothesis:

H 1c. *Works-council participation in apprenticeship decisions is ambiguous with regard to the number of apprenticeship contracts in relation to total employment.*

3.1.2 | Incomplete Contracts and Insider–Outsider Theory

The employment relationship, especially when involving investments in occupation-specific skills training, operates under incomplete contracts where employers may opportunistically abandon implicit promises about training quality or post-training employment (Kaufman and Levine 2000; Smith 1991). Effective works councils, exercising statutory rights, function as contract enforcers and quality guardians. By monitoring training plans, verifying trainer qualifications and ensuring fair procedures, works councils potentially mitigate the risk that a firm exploits apprentices as ‘cheap labour’ and foster trust. However, exercising this function depends on the works council’s power (success) to intervene when necessary to enforce training standards and reduce the risk of dropping out due to low training quality. We thus derive the following hypothesis:

H 2a. *Higher works-council success is associated with lower dropout during training.*

A works council’s authority may be strategically deployed for rent redistribution—securing enhanced compensation and working conditions for its constituents (Lindbeck and Snower 2001). This creates a potential tension between established employees (insiders) and apprentices aspiring to permanent employment (outsiders). Particularly effective works councils might deliberately constrain apprentice retention to limit future internal labour market competition, thereby safeguarding their primary constituency’s employment security and wage premiums. This theoretical mechanism aligns with empirical observations that

works councils routinely confront distributional conflicts and tend to represent majority interests, potentially at the expense of minority stakeholders (Freeman and Lazear 1995). Consequently, more powerful works councils may systematically advocate for policies leading to lower retention rates among apprenticeship graduates (e.g., limiting the number of permanent positions offered or tightening selection criteria), as insider protection can reinforce wage-floor screening. This potential negative influence on the number of permanent job offers to apprenticeship graduates, driven by power and insider interests, contrasts with the positive effect participation (voice) can have on the acceptance rate of offers made. Although a works council will ordinarily deploy its bargaining power, in the first instance, to guarantee a minimum level of training quality, the incremental exercise of that power may increasingly be channelled towards the protection of incumbent rents. At higher levels of council success, this distributional logic is therefore likely to outweigh the guardian role, prompting councils to restrain the volume of permanent appointments that would otherwise intensify internal labour-market competition. Thus, we derive the following hypothesis:

H 2b. *Higher works-council success reduces the share of apprenticeship graduates retained because insider protection and wage-floor screening lower the number of permanent employment offers.*

3.1.3 | Institutional Context: Collective Bargaining Agreements (CBAs)

CBAs affect the context in which works council function. When works councils operate in CBA-covered firms, they can focus more on non-wage issues (such as training quality or the retention of apprentices) because distributional wage conflicts are mostly resolved at sector level (Freeman and Lazear 1995). Moreover, CBAs set binding wage floors for member firms. These floors compress the wage distribution, forcing employers to pay workers of differing productivity a wage closer to the mean (Acemoglu and Pischke 1999; Dustmann and Schönberg 2009).

Two training-relevant consequences follow. First, the wage compression lowers the post-apprenticeship wage relative to the graduate's marginal product, enabling firms to recoup their training investments even when skills are occupation-specific. This may raise a firm's propensity to train apprentices. Second, because wages cannot be set below the corresponding tariff if a graduate turns out less productive than expected, CBA-covered firms will not offer lower ability completers a permanent employment contract. We thus derive the following two hypotheses:

H 3a. *CBA-covered firms are more likely to train apprentices.*

H 3b. *CBA-covered firms retain a smaller share of lower-performing graduates, leading to a lower overall retention rate than in non-covered firms.*

In sum, our theoretical framework provides a foundation for interpreting the associations between works council heterogeneity—characterized by participation (engagement) and success (power)—and apprenticeship training outcomes in

Germany. While there is a paucity of empirical studies on how works council heterogeneity affects apprenticeship outcomes, the following section reviews the existing empirical evidence on works councils and apprenticeship training, highlighting the research gap that our study addresses.

4 | Empirical Literature

4.1 | Works Councils and Apprenticeship Training

Early studies found that firms with a works council tend to have both lower apprenticeship participation and a lower intensity of apprenticeship training (Backes-Gellner et al. 1997; Niederaht 2004). By contrast, some more recent studies report that such differences are statistically insignificant (Bellmann et al. 2014; Czepek et al. 2015). Taken together, the literature indicates that contemporary works-council effects on training incidence are ambiguous and heterogeneous, which motivates our focus on field-specific participation and perceived success.

With respect to other apprenticeship-related outcomes, studies show that firms with works councils train at higher net costs, especially due to higher recruitment and wage expenses (Kriechel et al. 2014; Wenzelmann et al. 2017). Thus, such firms tend to follow a human capital investment strategy for long-term retention (Mohrenweiser and Backes-Gellner 2010; Pfeifer et al. 2019). This strategy is reflected in the higher retention rates of apprenticeship graduates in firms with works councils compared to those without works councils (Dummert 2021; Koch et al. 2019; Kriechel et al. 2014).

4.2 | Works Council Heterogeneity

Empirical studies mainly observe empirically whether or not a works council exists in a firm and how this binary indicator is related to apprenticeship outcomes. When considering potential works council heterogeneity, various other firm-level outcomes have been analysed with varied results. For instance, studies indicate that the participation of works councils in decision-making processes impacts outcomes such as technological and organizational innovation (Dilger 2002; Frick 2002), employee turnover (Dilger 2002, 2006), productivity, wages and profitability (Addison et al. 2020; Pfeifer 2011), financial stability and labour productivity growth (Addison et al. 2020) and environmental investments (Askildsen et al. 2006). These studies show that the influence of works councils depends significantly on their involvement in particular decisions, the type of works council in place and the nature of their relationship with management. Overall, this literature suggests that works council heterogeneity could also play a role in shaping the apprenticeship training behaviour of firms.

5 | Data and Descriptive Statistics

5.1 | Data

For our empirical analysis, we rely on data from the BIBB Establishment Panel on Training and Competence Development

(BIBB Training Panel) (Friedrich and Gerhards 2017; Gerhards et al. 2015). This dataset is a representative, annual survey of 3500–4000 German firms, offering detailed information on firms' training activities and a wide range of firm characteristics. While other surveys, such as the WSI-Works Council Survey, provide insights into the topics works councils focus on or the nature of their relationship with management, no dataset simultaneously offers information on both apprenticeship training outcomes and works council heterogeneity.

To address this gap, we incorporated additional variables into the 2015 wave of the BIBB Training Panel, capturing the heterogeneity of works councils, including their designated fields of activity and their success in enforcing agendas. This allows us to explore the connection between works council characteristics and apprenticeship training outcomes. To the best of our knowledge, this dataset is the only one that provides both comprehensive information on works council heterogeneity and firm-level apprenticeship training behaviour.

5.1.1 | Works Councils' Heterogeneity

Our analytic sample is restricted to establishments that report having an elected works council. We measure works council heterogeneity using nine dummy variables, each capturing whether the works council participates in decisions within specific fields of activity. These activities include recruitment of new employees, job reductions, measures to balance work and family life, promotions, investments in new technologies, decisions on further training and three apprenticeship training-related decisions (whether the firm offers apprenticeship training, the number of apprenticeships offered and the number of graduates to retain). Additionally, we create a composite dummy variable that takes the value of 1 if the works council participates in at least one of the three apprenticeship training decisions and 0 otherwise.

To assess the second dimension, works council success in enforcing its agenda, we construct a dummy variable from an original categorical variable ranging from 'not successful at all' to 'very successful' (Table 2). This dummy variable equals 1 if the works council is rated as 'mostly' or 'very successful' and 0 otherwise.²

While works councils exhibit heterogeneity along dimensions beyond participation in decision-making and success in enforcing agendas—such as their relationship with management, available resources, expertise in specific areas or the duration since their establishment—participation and success are key dimensions that we identify as crucial for their association with firm decisions. Future research could benefit from more granular data, capturing the extent to which different tasks occupy the works council's portfolio and assessing the success of the works council in each specific field of activity.

5.1.2 | Apprenticeship Training

We utilize several indicators to capture different stages of the apprenticeship training process within firms. These include the decisions on 'whether to train apprentices', 'how many appren-

tices to train in relation to total employment (training intensity)', the 'share of successful graduates retained', and the 'share of apprentices who drop out'.

The variable *Training participation* is set to 1 if the firm had at least one apprentice (in a BBiG/HwO-recognized occupation) as of 31 December 2014, and 0 otherwise. The *Number of apprentices in relation to total employment* refers to the total number of apprentices (in BBiG/HwO-recognized occupations) and total employment on the same date. We will hereafter refer to this variable as 'training intensity' for brevity in the descriptives and regression tables. The *Retention rate* is calculated as the share of successfully graduated apprentices retained by the firm out of all apprentices who passed their final exams. Additionally, the *Share of dropouts* is defined as the ratio of apprentices who dropped out in 2014 to the total number of apprentices on 31 December 2014, plus graduates and dropouts during that year.

5.1.3 | Control Variables

The estimation sample comprises only establishments that already have a works council, yet considerable heterogeneity remains in both the scope of council rights and firms' training needs. To absorb this heterogeneity, we draw on the rich covariates in the BIBB Training Panel. Establishment size is entered as four categories (1–19, 20–99, 100–199 and ≥ 200 employees), because co-determination rights under the WCA broaden stepwise with size and bargaining power tends to rise in parallel (Ellguth and Kohaut 2022). We also include collective-bargaining coverage, a full set of two-digit industry dummies and a dummy for West Germany. Even among works council firms, the prevalence of collective agreements and the tightness of apprenticeship markets differ markedly across industries and remain lower in the East; for example, East-German firms still report applicant shortages, whereas West-German industrial occupations often attract excess applicants (BIBB 2024). Controlling for industry and region mitigates the risk that the estimated works-council coefficients inadvertently capture sectoral or regional imbalances in the supply of—and demand for—apprentices. Finally, the models contain workforce-composition variables—the share of fixed-term contracts, the proportion of positions classified as skilled and the average skilled-worker wage—which proxy, respectively, employment stability, baseline demand for apprentices and establishment-level productivity.³

5.2 | Descriptives

5.2.1 | Sample Description

To examine the association between works council heterogeneity and apprenticeship training outcomes, we restrict our sample to firms that have established works councils, exploiting the variation in works councils' participation in apprenticeship-related decisions and their success in enforcing their agendas. This study differs from most empirical research on works councils, which typically compares firms with works councils to those without. Such comparisons may be prone to bias due to unobserved factors that influence the presence of works councils in firms. By leveraging the 'within-firm variation' in works council participation

areas and agenda success, our analysis mitigates this specific source of selection bias.

Further sample restrictions arise due to the different outcome variables corresponding to specific subgroups of firms. As these outcome variables are only available for certain firms, each analysis is conducted on a slightly different subset of the data. Tables A1 and A2 present summary statistics for the relevant sample variables corresponding to each outcome variable. *Sample 1*, for ‘training participation’, includes all firms with works councils and valid data on training participation, works council involvement in the decision of ‘whether to train apprentices’, their success in enforcing their agenda and all control variables (Table A1). *Sample 2*, for the ‘training intensity’, includes all firms with works councils that had apprentices as of December 31st, with valid information on the number of apprentices, the works council’s participation in decisions regarding ‘how many apprenticeships to hire’, their success and all control variables (Table A1). *Sample 3*, for the ‘retention rate’, focuses on firms with works councils that had apprentices participating in graduation exams in 2014. This sample includes firms with valid data on the number of apprentices who took the final exams, the number of apprentices who successfully graduated, the works council’s involvement in decisions regarding ‘how many graduates to retain’, their success and all control variables (Table A2). *Sample 4*, for the ‘share of dropouts’, includes all firms with works councils that had apprentices as of December 31st and information on apprentices who dropped out. This sample captures data on works council participation in at least one apprenticeship topic, their success and all control variables (Table A2). These restrictions result in four distinct samples, ranging from 1046 to 1669 observations.

5.2.2 | Descriptive Statistics

Works councils engage with a wide range of topics, and the likelihood of their involvement in specific areas of decision-making varies significantly (Table 1). Nearly 90% of works councils participate in decisions related to the recruitment of new employees and job cuts, whereas less than 20% are involved in decisions regarding investments in new technologies.

A similar heterogeneity exists within the realm of apprenticeship training. Approximately 50% of works councils are involved in decisions regarding the retention of apprentices, whereas participation decreases to about 26% for decisions concerning the number of apprenticeships offered. Moreover, 33% of works councils take part in determining whether the firm engages in apprenticeship training at all. These initial findings demonstrate that works councils are not as homogeneous as previously assumed. The presence of a works council in a firm does not automatically imply that it is highly successful or actively involved in key decisions related to apprenticeship training. This observed heterogeneity in the functioning of works councils suggests that diverse effects on apprenticeship training outcomes are plausible and warrants further analysis.

The second dimension of works councils’ heterogeneity focuses on the variation in their success in enforcing their agenda within

firms. Table 2 provides the shares of successful works councils by firm size, industry and location. Table 3 presents apprenticeship training outcomes based on works councils’ participation in the relevant decisions and their success in enforcing their agendas.⁴ In firms where the works council participates in the decision of whether to engage in apprenticeship training, the share of firms training at least one apprentice is significantly higher compared to firms where the works council does not participate in this decision. The number of apprentices relative to total employment, however, is not significantly associated with a works council’s participation in the decision of how many apprentices to hire.

The retention rate is notably higher in firms where works councils are involved in decisions concerning the number of apprenticeship graduates to be retained. In contrast, the difference in the share of dropouts between firms with works council participation in at least one apprenticeship-related decision and those without is small and statistically insignificant.

Regarding the success of works councils, both the retention rate and the share of dropouts are significantly lower in firms where works councils are successful in enforcing their agendas, compared to firms with less successful works councils. However, there are no significant differences in training participation or the number of apprentices relative to total employment based on works council success.

Particularly noteworthy is the finding of a lower retention rate in firms with successful works councils, which offers initial insights into the dynamics at play. Successful works councils may prioritize the interests of incumbent employees over those of apprenticeship graduates, potentially offering long-term employment opportunities to a smaller group of graduates while limiting the overall number of retained apprentices. This approach could be aimed at protecting existing employees from competition with new apprenticeship graduates and securing stable employment for both the established workforce and a select group of graduates.

6 | Empirical Model

Our empirical analysis examines associations between works council heterogeneity and apprenticeship training outcomes, rather than causal effects. We acknowledge that our cross-sectional data lack suitable instrumental variables for works council participation and success, and we do not have panel variation in works council involvement that would allow us to employ fixed-effects strategies. Therefore, our identification strategy relies on selection-on-observables assumptions, using robust methods to adjust for observed confounding while recognizing that unobserved factors may influence both works council characteristics and training outcomes.⁵

We analyse two dimensions of employee representation at the establishment level: a works council’s participation in apprenticeship-related decision-making processes and the works council’s perceived success. Additionally, we also analyse the coverage by a sectoral-level CBA. Four apprenticeship outcomes are considered—whether the establishment trains at all, the number of apprenticeship contracts in relation to total employment (training intensity), the retention rate upon completion and the

TABLE 1 | Share of firms in which works councils participate in certain decisions, in %.

	1	2	3	4	5	6	7	8	9	10
Total	59.7	50.3	32.6	25.8	90.0	87.9	72.9	63.3	43.4	18.3
1–19	56.9	50.7	34.1	18.2	76.0	86.1	65.3	58.7	29.2	4.2
20–99	54.2	43.1	29.3	26.6	94.7	86.5	73.0	60.1	49.0	19.3
100–199	64.8	51.9	38.8	38.7	97.5	94.1	74.6	62.0	50.6	29.0
200 and more	75.5	67.5	33.9	27.7	98.0	90.1	85.7	81.6	49.7	33.8
Agric., mining, energy	90.3	59.8	52.4	55.6	97.7	94.7	82.9	82.7	58.0	43.0
Manufacturing	61.9	47.0	32.0	23.1	90.1	97.8	65.4	40.3	28.6	20.5
Construction	48.5	43.7	32.2	21.4	90.1	100.0	42.9	40.9	43.4	41.7
Trade, repair services	71.4	45.5	49.9	35.2	92.6	98.9	63.2	38.9	47.9	21.1
Business services	31.6	25.2	15.8	16.5	57.7	64.5	35.5	38.7	24.3	10.2
Personal services	83.2	79.9	42.7	46.0	96.8	94.7	85.0	87.4	19.3	12.0
Medical services	58.8	54.2	27.3	14.0	94.0	89.3	79.0	65.0	61.3	18.5
Public services, education	54.0	43.2	33.3	25.7	97.2	84.5	88.1	78.3	54.4	20.2
East	72.9	63.1	36.4	37.5	94.3	89.5	83.6	48.9	56.6	23.4
West	57.4	48.1	32.0	23.8	89.3	87.6	71.0	65.8	41.1	17.4

Note: Column titles are as follows: (1) at least one apprenticeship topic, (2) number of graduates to retained, (3) to train apprentices or not, (4) number of apprenticeships offered, (5) hiring of new employees, (6) job cuts, (7) balance work and family life, (8) promotions, (9) further training, (10) new technologies. BIBB-QP 2015, design weighted, $N = 1547$ (sample: firms with works councils, with valid information on works-councils participation for all nine decisions and on the works-councils success).

TABLE 2 | Works councils' success in enforcing their agenda, in %.

	Not at all successful	Less successful	Mostly successful	Very successful
Total	0.7	12.7	70.9	15.8
1–19	0.1	22.9	69.5	7.5
20–99	0.7	9.4	71.5	18.5
100–199	1.8	8.5	67.9	21.8
200 and more	0.1	5.5	74.1	19.7
Agriculture, mining, energy	0.0	7.8	62.3	29.9
Manufacturing	0.9	14.7	71.4	13.0
Construction	2.5	7.6	73.2	16.7
Trade, repair	0.5	1.4	80.6	17.5
Business services	0.0	13.2	77.1	9.7
Personal services	0.4	32.7	57.5	9.5
Medical services	1.0	5.6	78.6	14.8
Public services, education	0.6	10.8	64.9	23.8
East	1.6	10.1	69.4	18.9
West	0.5	13.1	71.1	15.3

Note: BIBB-QP 2015, design weighted, $N = 1547$ (sample: firms with works councils, with valid information on works-councils participation for all nine decisions and on works-councils success).

TABLE 3 | Outcomes on apprenticeship training by works councils' participation and success.

	Training participation	Training intensity	Retention rate	Dropout share
Participating works councils				
Mean	0.487	0.037	0.760	0.028
SD	0.500	0.061	0.358	0.093
Not-participating works council				
Mean	0.408	0.037	0.712	0.022
SD	0.492	0.072	0.405	0.060
Difference	0.079***	−0.000	0.048**	0.007
Successful works council				
Mean	0.433	0.037	0.719	0.025
SD	0.496	0.068	0.390	0.074
Rather not successful works council				
Mean	0.425	0.043	0.855	0.039
SD	0.496	0.079	0.308	0.135
Difference	0.008	−0.006	−0.136***	−0.014**
Observations	1669	1643	1046	1299

Note: BIBB-QP 2015, design weighted, sample: firms with a works council and valid information on works-councils success and participation in the relevant decision 'whether to train' for Column (1); 'how many apprentices' for Column (2); 'how many graduates to retain' for Column (3); at least one apprenticeship topic for Column (4).

*, ** and *** denote significance at the 10%, 5% and 1% levels.

dropout rate during training. In our regressions the sample is limited to works-council firms, so coefficients capture within-council variation in activism rather than differences between firms with and without a council.

Our baseline specification employs inverse-probability-weighted regression adjustment (IPWRA), which combines a treatment-assignment model and an outcome model and is doubly robust within a selection-on-observables framework, delivering consistent estimates if either component is correctly specified (Słoczyński and Wooldridge 2018; Wooldridge 2010).⁶

For every representation variable examined, we estimate a logit propensity-score model that includes a rich set of establishment controls—employment size (four bands), two-digit industry, East/West location, the share of skilled jobs, the average monthly wage of skilled workers (divided by 100), and the share of fixed-term contracts—and we always include the two remaining representation variables to limit mutual confounding. The outcome equation is specified as a logit for the binary training indicator and as a fractional logit for the three proportional outcome variables.

To assess the robustness of our findings, we supplement the IPWRA results with estimates obtained from two alternative methods. First, we use the standard augmented inverse probability weighting (AIPW) estimator, applying the same model specifications as for IPWRA. Second, we employ propensity score matching (PSM), which relies on matching establishments based on the estimated propensity score derived from the same specification used in IPWRA/AIPW (including control variables

and the other two key independent variables). These robustness checks allow us to evaluate the consistency of the estimated associations across different methodological approaches designed to handle selection on observables. Throughout our analysis, we interpret the results as robustly estimated associations adjusted for observed confounding factors, acknowledging that causal claims are limited by the observational nature of the data.

We recognize that decisions regarding works council participation and outcomes in terms of works council success are unlikely to be as good as random, even when accounting for a rich set of control variables. To the best of our knowledge, no existing studies specifically address the determinants of these decisions, as most empirical studies analyse binary variables of works council existence or works council establishment. Thus, concerns about potential endogeneity bias remain unresolved in the absence of random variation, which is not practically achievable. For example, managerial competence or managerial pressure may not only play an important role when it comes to establishing works councils (Fitzroy and Kraft 1987), but also regarding how much power a works council obtains, or what fields works councils participate in. Consequently, we refrain from interpreting our estimated associations as strictly causal. Instead, we interpret them as reflecting associations within a selection-on-observables framework, adjusted using robust methods.

7 | Empirical Results

Our empirical findings regarding the association between works council heterogeneity, CBA and apprenticeship outcomes are

TABLE 4 | Inverse-probability-weighted regression adjustment models (logit AME/fractional logit AME): associations between works-council dimensions, CBA and apprenticeship outcomes.

	Training participation (logit AME)	Training intensity (fractional logistic AME)	Retention rate (fractional logistic AME)	Dropout share (fractional logistic AME)
Works council participates in apprenticeship decisions	0.047** (0.0191)	0.003 (0.0041)	0.068*** (0.0200)	0.008* (0.0040)
Works council perceived as successful	0.027 (0.0296)	0.002 (0.0071)	−0.068*** (0.0259)	−0.028** (0.0137)
Collective bargaining agreement (CBA)	−0.030 (0.0218)	0.003 (0.0035)	−0.011 (0.0241)	0.003 (0.0049)
<i>N</i>	1669	1643	1046	1299

Note: BIBB-QP 2015. Column (1) reports average marginal effects (AMEs) from a Logit outcome model (percentage-point change). Columns (2)–(4) report fractional logistic AME coefficients (level change). Sample: firms with works councils and valid information on works-councils participation in the relevant decision ('whether to train' for Column 1; 'how many apprentices' for Column 2; 'how many graduates to retain' for Column 3; at least one apprenticeship topic for Column 4). All models contain a full set of institutional covariates (participation, success and CBA). Controls: firm size dummies, 2-digit industry dummies, West Germany, share of skilled jobs, average skilled wage (€/100), share of fixed-term workers. Robust standard errors are shown in parentheses.

*, ** and *** denote significance at the 10%, 5% and 1% levels.

summarized in Table 4. We now discuss these results for each of our four key outcomes, evaluating them against the hypotheses developed in Section 3.

Beginning with the firm's decision to engage in apprenticeship training (Table 4, Column 1), we find that works council participation in apprenticeship-related decisions is associated with a 4.7 percentage point higher likelihood of a firm training apprentices. This result provides support for Hypothesis 1a, suggesting that the 'collective voice' mechanism (see Section 3.1.1) indeed translates into a greater propensity for firms to train, as works councils advocate for apprentice concerns and improve communication. In contrast, the presence of a CBA shows no statistically significant association with the training participation, thus not supporting Hypothesis 3a. Regarding training intensity, defined as the number of apprentices relative to total employment (Table 4, Column 2), our results do not show a statistically significant association for works council participation, which is consistent with the theoretically ambiguous prediction in Hypothesis 1c.

Turning to the retention of apprentices after graduation (Table 4, Column 3), we find that works council participation in retention decisions is associated with a 6.8 percentage point higher retention rate. This finding supports Hypothesis 1b, aligning with the 'collective voice' theory (Section 3.1.1) where active councils may improve the training environment, advocate for graduates to be retained and foster higher offer acceptance rates. This role may also reflect efforts to strengthen internal labour markets and safeguard firm-specific skills. In contrast, and providing support for Hypothesis 2b (Section 3.1.2), higher works council success is linked to a significantly lower retention rate. This aligns with 'insider-outsider' theory, suggesting that more powerful works councils might indeed prioritize the interests of incumbent employees, potentially limiting apprentice retention to mitigate internal labour market competition for existing skilled workers and a select group of apprentices. The CBA indicator is statistically insignificant, providing no support for Hypothesis 3b.

Earlier studies contrast CBA-covered and uncovered firms in the full population, whereas our comparison is confined to establishments that already have a works council. Within this narrower universe, the standard CBA mechanisms, such as wage-floor screening impacting apprentice retention, may dissipate. This could be because works councils themselves already influence firms' apprentice selection and retention standards, potentially diminishing the distinct impact of CBA coverage in this specific subgroup. As our focus is works-council heterogeneity, we do not investigate this null result further.

Finally, concerning apprenticeship dropout rates (Table 4, Column 4), our results indicate that higher works council success is associated with a significantly lower share of dropouts (a reduction of 2.8 percentage points compared to less successful councils). This supports Hypothesis 2a, which posits that more effective works councils, acting as 'quality guardians' under the theory of incomplete contracts (Section 3.1.2), contribute to a better training environment. Interestingly, works council participation in apprenticeship-related decisions is associated with a marginally higher dropout rate (0.8 percentage points). A possible explanation for this is that works councils actively involved in apprenticeship matters, particularly those focused on achieving high ultimate retention rates for suitable candidates, may encourage a more stringent evaluation during the initial probation period. Consequently, apprentices deemed unsuitable are let go during the probationary period, rather than completing their training only to be denied a permanent position later. However, our data on dropouts do not allow us to distinguish the precise timing of contract dissolution—whether it occurred during the probationary period or later, or whether dropout was initiated by the firm or apprentice.⁷

Overall, these findings highlight that the mere presence of a works council is not uniform in its effects. Instead, the specific dimensions of works council participation and perceived success, along with the broader institutional context, appear to play

TABLE 5 | Inverse-probability-weighted regression adjustment models (logit AME/fractional logit AME): associations between works-council dimensions, CBA and apprenticeship outcomes (without public sector).

	Training participation (logit AME)	Training intensity (fractional logistic AME)	Retention rate (fractional logistic AME)	Dropout share (fractional logistic AME)
Works council participates in apprenticeship decisions	0.045** (0.0205)	0.003 (0.0034)	0.050** (0.0215)	0.010** (0.0049)
Works council perceived as successful	−0.028 (0.0256)	0.005 (0.0041)	−0.082*** (0.0277)	−0.030** (0.0135)
Collective bargaining agreement (CBA)	−0.028 (0.0229)	0.004 (0.0032)	−0.030 (0.0269)	0.000 (0.0066)
<i>N</i>	1306	1287	833	1206

Note: BIBB-QP 2015. Column (1) reports average marginal effects (AMEs) from a Logit outcome model (percentage-point change). Columns (2)–(4) report fractional logistic AME coefficients (level change). Sample: firms with works councils (without public sector) and valid information on works-councils participation in the relevant decision ('whether to train' for Column 1; 'how many apprentices' for Column 2; 'how many graduates to retain' for Column 3; at least one apprenticeship topic for Column 4). All models contain a full set of institutional covariates (participation, success and CBA). Controls: firm size dummies, 2-digit industry dummies, West Germany, share of skilled jobs, average skilled wage (€/100), share of fixed-term workers. Robust standard errors are shown in parentheses.

*, ** and *** denote significance at the 10%, 5% and 1% levels.

distinct and sometimes counteracting roles in shaping firms' apprenticeship training decisions and outcomes.

7.1 | Robustness Analysis

Works councils are more frequently present in the public sector and tend to exert a stronger influence there than in the private sector. Consequently, many empirical studies examining the relationship between works councils and various outcomes exclude the public sector from their analysis. In this article, we have thus far included all economic sectors in our analyses (Table 4), contending that works council participation in apprenticeship training decisions and their success does not systematically vary by sector. To ensure that the results presented are not disproportionately driven by the public sector, Table 5 reports findings based on a subsample that excludes this sector. Apart from the restricted sample, the empirical approach remains identical with that used in Table 4. Additionally, as with previous analyses, alternative models that incorporate only a reduced set of basic control variables (firm size, industry and location in West Germany; see Table A4) are presented in Table A11.⁸ The results are in line with those of the full sample reported in Table 4. In line with the presentation in Tables 1–3 and Tables A1–A3, the [Supporting Information Appendix](#) provides information for the subsample excluding the public sector, including summary statistics, data on the key variables relating to works council heterogeneity, apprenticeship outcomes by works council participation and success, and Probit regression results on works council presence, participation and success (Tables A5–A10).

Furthermore, subgroup analysis along firm characteristics provides insights into heterogeneities (Table A12). The main pattern of empirical results regarding participation of works councils in apprenticeship-related decision processes and the retention rate, shown in Table 4, mainly go back to large firms with 250 or more employees and firms covered by a CBA. The positive association with the propensity to train apprentices, however,

exists in all subsamples. Moreover, we find that our main results regarding works council success and its negative association with the retention rate are driven by large firms and firms covered by a CBA.⁹ The positive association between an active works council and the training propensity is evident regardless of collective bargaining. In sum, the robustness analysis reveals that our main result regarding the retention rate presented in Table 4 is primarily driven by large firms and firms that are covered by a CBA.

Complementing our subsample analysis in Table A12 as well as the results provided in Table 4 (full sample) and Table 5 (excluding public-sector firms), we also separately consider the institutional environment of public-sector firms. The results, provided in Table A13, show that in this subsample, works councils perceived as 'successful' are associated with a significantly lower training intensity. This aligns with expectations from insider-outsider theory, suggesting that successful works councils in the public sector might prioritize incumbent employees by fostering a more selective apprentice intake. Conversely, and consistent with collective voice theory, the participation of works councils in retention-related decisions in public-sector firms is linked to a higher retention rate for apprenticeship graduates. Notably, unlike in the overall sample, works council success in public-sector firms is not negatively associated with the retention rate itself. This points to distinct mechanisms at play within this sector: Successful works councils here appear to be associated with a more selective initial intake of apprentices, rather than with limiting the retention of those who complete their training.

To address concerns about the dichotomization of the works council 'success' variable (originally a four-category measure) into a binary indicator ('low success' vs. 'high success'), we conducted additional robustness checks. We re-estimated our models using an alternative specification for 'success', differentiating between 'not at all/less successful', 'mostly successful' and 'very successful' works councils, with 'mostly successful' as the reference category (see Tables A14 and A15). These analyses

show that the associations with apprenticeship outcomes do not significantly differ between firms where works councils are perceived as 'very successful' compared to those where they are 'mostly successful'. Given the small number of observations in the 'not at all successful' category, and to maintain clarity and simplify the interpretation of our main findings, we retained the binary specification of the 'success' variable in our primary analyses.

As a final robustness check, we complement the IPWRA estimates with PSM and AIPW estimates, with the latter being another doubly robust specification. Although PSM balances treated and control observations based on observables, without relying on outcome-model assumptions, AIPW is similar to IPWRA and retains robustness to misspecification in either the treatment or the outcome model. Across all four apprenticeship outcomes the point estimates, signs and significance levels for training intensity, retention rate and dropout share remain essentially unchanged under both alternatives, confirming that our main conclusions are insensitive to estimator choice (Tables A16 and A17). However, the coefficients for training participation, while positive, are not statistically significant when applying the PSM estimator but are almost identical and statistically significant when using the AIPW estimator.

8 | Conclusion

Apprenticeship training is a key component of Germany's education system and labour market, with about half of each youth cohort pursuing it to qualify for a specific occupation. For firms, the main motivation is to meet future skilled labour needs, while also supporting a steady supply of skilled workers for the broader economy. Understanding the factors driving firms' decisions to initiate and retain apprenticeship training is crucial for shaping the future supply of skilled labour. Works councils, with significant co-determination rights over training policies, have been studied for their association with apprenticeship outcomes, primarily comparing firms with and without councils. This article, however, focused on the heterogeneity within works councils, examining their involvement in training decisions and success in advancing their agenda, and their link to apprenticeship outcomes.

Using representative firm-level data from the BIBB Establishment Panel on Training and Competence Development (BIBB Training Panel), our descriptive analysis reveals that approximately 25%–50% of works councils participate in decisions related to apprenticeship training. This suggests that apprenticeship training is not a self-evident priority for the majority of works councils. Additionally, we observe significant variation in works councils' success, indicating that success cannot be assumed to be a uniform characteristic.

Our regression analysis shows that works council participation in apprenticeship-related decisions is associated with a higher propensity for firms to engage in training and a significantly higher retention rate of apprenticeship graduates, though it is not significantly linked to training intensity. This supports the 'collective voice' aspect of works councils, suggesting their active involvement fosters a pro-training environment. The presence of

a CBA was not found to have a robust and statistically significant association with any of the four apprenticeship outcomes in our main models. More strikingly, works council success presents a duality: While successful works councils are linked to significantly fewer apprentice dropouts—underscoring their role as 'quality guardians'—they are also associated with lower retention of apprenticeship graduates. This latter finding aligns with insider-outsider theory, suggesting that more powerful councils may prioritize incumbent interests, potentially limiting opportunities for newly graduated apprentices.

These findings suggest that apprenticeship training outcomes are linked to the characteristics of works councils, including their success in enforcing their agenda and their participation in relevant decisions, as well as the broader institutional context in which they operate (CBAs). Consequently, our results highlight that the conclusions of previous studies on the effects of works councils on apprenticeship training cannot be universally applied to all firms with works councils, and that the implicit assumption of homogeneous works councils in prior studies does not hold. An important limitation of this study is its cross-sectional design, which means our findings represent robust associations rather than causal effects. Furthermore, the general, perception-based nature of the works council 'success' measure also suggests avenues for future research. Longitudinal data could help to better understand the dynamics of works council influence, although causal identification remains a challenge in this context. However, by accounting for two key dimensions of works council heterogeneity, our analysis offers new insights into the relationship between works councils and apprenticeship training.

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Ethics Statement

The authors have nothing to report.

Data Availability Statement

The 'BIBB Establishment Panel on Training and Competence Development' is provided by the Research Data Centre at the Federal Institute for Vocational Education and Training (BIBB-FDZ). Detailed information is provided in the section Data access and the BIBB-FDZ metadata portal.

Endnotes

¹ Throughout the article, 'success' denotes the perception-based rating provided by the establishment's survey respondent on how successfully the works council fulfils its tasks, rather than an externally audited or quantitative performance metric. Success refers to the establishment respondent's overall assessment of how effectively the works council fulfils its tasks, not to success restricted to apprenticeship issues.

² Original survey item (BIBB-QP 2015, German wording): 'Wie erfolgreich nimmt der Betriebs- oder Personalrat in Ihrem Betrieb seine Aufgaben wahr? Unser Betriebs- bzw. Personalrat ist in dieser Hinsicht ... sehr erfolgreich/überwiegend erfolgreich/weniger erfolgreich/überhaupt nicht erfolgreich.' English translation: 'How successful is the works council in performing its tasks in your establishment? Our works council is ... very successful/mostly successful/less successful/not at all successful.' We reverse-code the answers so that higher

values indicate greater success (4 = 'very successful' ... 1 = 'not at all successful').

³Data contains the average gross monthly wage of full-time employees in skilled jobs. For further analysis, we generated a wage variable by dividing the survey values by 100.

⁴Table 3 reports for each outcome, mean and standard deviation for the firms with a participating (successful) works council and for firms with a not-participating (rather not successful) works council, as well as the difference, and the number of observations. The variation of the latter results from the varying samples for each outcome (see Tables A1 and A2).

⁵Although reverse causation is less likely given that 70% of works councils do not participate in training decisions despite having the legal right to do so, we cannot rule out that firms' training activities may influence councils' involvement in these decisions. Therefore, we interpret our findings as associations rather than causal effects.

⁶We estimate these models using the *teffects* command in Stata (Stata 2023).

⁷Because of potential concerns that excluding firms without works councils might bias our main results, we re-estimated our models using the full sample, adding dummy variables for active, inactive, successful and unsuccessful councils (Table A18). Our key findings on works council participation and success remain qualitatively unaffected. Additionally, we find no significant difference in our outcome variables between firms without works councils and those with either inactive or unsuccessful councils.

⁸Summary statistics for Samples 1–4, excluding the public sector, are presented in Tables A5 and A6. Information regarding the share of firms in which works councils participate in specific decisions, as well as data on the success of works councils, is provided for the same subsample in Tables A8 and A9. Apprenticeship training outcomes, disaggregated by works council participation and success, for the subsample excluding the public sector, are presented in Table A10. Additionally, Table A7 reports the results of Probit regressions on the presence of works councils (Column 1), works council participation in selected decisions related to apprenticeship training (Columns 2–5) and works council success (Column 6), for the sample excluding the public sector.

⁹Note that only 23% of firms with works councils are not covered by a collective bargaining agreement (Table A1).

References

- Acemoglu, D., and J.-S. Pischke. 1999. "The Structure of Wages and Investment in General Training." *Journal of Political Economy* 107, no. 3: 539–572. <https://doi.org/10.1086/250071>.
- Addison, J. T., P. Teixeira, and L. Bellmann. 2020. "Management Practices and Establishment Performance Under Non-Union Workplace Representation." CESifo Working Paper No. 8599. <https://doi.org/10.2139/ssrn.3707939>.
- Askildsen, J. E., U. Jirjahn, and S. C. Smith. 2006. "Works Councils and Environmental Investment: Theory and Evidence From German Panel Data." *Journal of Economic Behavior & Organization* 60, no. 3: 346–372. <https://doi.org/10.1016/j.jebo.2004.01.006>.
- Backes-Gellner, U., B. Frick, and D. Sadowski. 1997. "Codetermination and Personnel Policies of German Firms: The Influence of Works Councils on Turnover and Further Training." *International Journal of Human Resource Management* 8, no. 3: 328–347. <https://doi.org/10.1080/095851997341676>.
- Bellmann, L., H.-D. Gerner, and U. Leber. 2014. "Firm-Provided Training During the Great Recession." *Jahrbücher Für Nationalökonomie Und Statistik* 234, no. 1: 5–22. <https://doi.org/10.1515/jbnst-2014-0103>.
- BIBB. 2024. *Datenreport zum Berufsbildungsbericht 2024: Informationen und Analysen zur Entwicklung der Beruflichen Bildung*. Bundesinsti-

tut für Berufsbildung (BIBB). <https://www.bibb.de/dokumente/pdf/bibb-datenreport-2024-final.pdf>.

- Budde, J., T. Dohmen, S. Jäger, and S. Trenkle. 2024. Worker Representatives. IZA DP No. 17152. Institute of Labor Economics (IZA).
- Czepek, J., S. Dummert, A. Kubis, U. Leber, A. Müller, and J. Stegmaier. 2015. *Betriebe im Wettbewerb Um Arbeitskräfte: Bedarf, Engpässe und Rekrutierungsprozesse in Deutschland*. W. Bertelsmann Verlag.
- Dilger, A. 2002. *Ökonomik Betrieblicher Mitbestimmung: Die Wirtschaftlichen Folgen von Betriebsräten*. R. Hampp.
- Dilger, A. 2006. "Kooperation Zwischen Betriebsrat und Management: Die Sicht Beider Seiten und Deren Folgen/Cooperation Between Works Council and Management: The View From Both Sides and Its Consequences." *Jahrbücher Für Nationalökonomie Und Statistik* 226, no. 5: 562–587. <https://doi.org/10.1515/9783110511802-006>.
- Dummert, S. 2021. "Employment Prospects After Completing Vocational Training in Germany From 2008–2014: A Comprehensive Analysis." *Journal of Vocational Education & Training* 73, no. 3: 367–391. <https://doi.org/10.1080/13636820.2020.1715467>.
- Dustmann, C., and U. Schönberg. 2009. "Training and Union Wages." *Review of Economics and Statistics* 91, no. 2: 363–376. <https://doi.org/10.1162/rest.91.2.363>.
- Ellguth, P., and S. Kohaut. 2022. "Tarifbindung und Betriebliche Interessenvertretung: Ergebnisse aus dem IAB-Betriebspanel 2021." *WSI-Mitteilungen* 75, no. 4: 328–337. <https://doi.org/10.5771/0342-300X-2022-4-328>.
- Fitzroy, F. R., and K. Kraft. 1987. "Efficiency and Internal Organization: Works Councils in West German Firms." *Economica* 54, no. 216: 493–504. <https://doi.org/10.2307/2554183>.
- Freeman, R. 1980. "The Exit-Voice Tradeoff in the Labor Market: Unionism, Job Tenure, Quits, and Separations." *Quarterly Journal of Economics* 94, no. 4: 643–673. <https://doi.org/10.2307/1885662>.
- Freeman, R., and E. Lazear. 1995. "An Economic Analysis of Works councils." In *Works Councils—Consultation, Representation and Cooperation in Industrial Relations*, edited by J. Rogers, and W. Streeck, 27–50. University of Chicago Press.
- Freeman, R., and J. Medoff. 1984. "Trade Unions and Productivity: Some New Evidence on an Old Issue." *ANNALS of the American Academy of Political and Social Science* 473, no. 1: 149–164. <https://doi.org/10.1177/0002716284473001015>.
- Frick, B. 2002. "High Performance Work Practices und Betriebliche Mitbestimmung: Komplementär oder Substitutiv? Empirische Befunde für den Deutschen Maschinenbau." *Industrielle Beziehungen/The German Journal of Industrial Relations* 9, no. 1: 79–102.
- Friedrich, A., and C. Gerhards. 2017. *BIBB-Qualifizierungspanel 2015. Version 1.1*. Bundesinstitut für Berufsbildung.
- Gerhards, C., S. Mohr, and K. Troltsch. 2015. *BIBB Establishment Panel on Training and Competence Development 2015*. Research Data Centre at the Federal Institute for Vocational Education and Training (BIBB-FDZ). <https://doi.org/10.7803/371.15.1.2.10>. <https://www.bibb.de/de/1372.php>.
- Hirschman, A. 1970. *Exit, Voice, and Loyalty. Responses to Decline in Firms, Organizations and States*. Harvard University Press.
- Jäger, S., S. Noy, and B. Schoefer. 2022. "The German Model of Industrial Relations: Balancing Flexibility and Collective Action." *Journal of Economic Perspectives* 36, no. 4: 53–80. <https://doi.org/10.1257/jep.36.4.53>.
- Kaufman, B., and D. Levine. 2000. "An Economic Analysis of Employee Representation." In *Non-Union Employee Representation*, edited by B. Kaufman, and D. Taras, 149–157. Routledge.
- Koch, B., S. Muehlemann, and H. Pfeifer. 2019. "Do Works Councils Improve the Quality of Apprenticeship Training? Evidence From German Workplace Data." *Journal of Participation and Employee Ownership* 2, no. 1: 47–59. <https://doi.org/10.1108/JPEO-12-2017-0009>.
- Kriechel, B., S. Muehlemann, H. Pfeifer, and M. Schütte. 2014. "Works Councils, Collective Bargaining, and Apprenticeship Training: Evidence

- From German Firms.” *Industrial Relations: A Journal of Economy and Society* 53, no. 2: 199–222. <https://doi.org/10.1111/irel.12061>.
- Lindbeck, A., and D. J. Snower. 2001. “Insiders Versus Outsiders.” *Journal of Economic Perspectives* 15, no. 1: 165–188. <https://pubs.aeaweb.org/doi/pdf/10.1257/jep.15.1.165>.
- Mohr, S. 2023. “Betriebliche Ausbildungsbeteiligung—Ergebnisse der Beschäftigungsstatistik der BA.” In *Datenreport Zum Berufsbildungsbericht 2023: Informationen und Analysen zur Entwicklung der Beruflichen Bildung*. Bundesinstitut für Berufsbildung.
- Mohrenweiser, J., and U. Backes-Gellner. 2010. “Apprenticeship Training: For Investment or Substitution?” *International Journal of Manpower* 31, no. 5: 545–562. <https://doi.org/10.1108/01437721011066353>.
- Niederalt, M. 2004. *Zur Ökonomischen Analyse Betrieblicher Lehrstellenangebote in der Bundesrepublik Deutschland*. P. Lang.
- OECD. 2023. *Education at a Glance 2023: OECD Indicators*. OECD Publishing. <https://doi.org/10.1787/e13bef63-en>.
- Pfeifer, C. 2011. “The Heterogeneous Economic Consequences of Works Council Relations.” *Schmollers Jahrbuch* 131, no. 1: 59–71. <https://doi.org/10.3790/schm.131.1.59>.
- Pfeifer, H., G. Schönfeld, and F. Wenzelmann. 2019. “Firms’ Motivation to Train Apprentices—A Matter of Social Responsibility?” *Formation Emploi* 146, no. 2: 29–52.
- Schönfeld, G., F. Wenzelmann, and H. Pfeifer. 2020. “Kosten und Nutzen der Betrieblichen Berufsausbildung—Ergebnisse der Kosten-Nutzen-Erhebung 2017/2018.” In *Datenreport Zum Berufsbildungsbericht 2020: Informationen und Analysen zur Entwicklung der Beruflichen Bildung*. Bundesinstitut für Berufsbildung.
- Słoczyński, T., and J. M. Wooldridge. 2018. “A General Double Robustness Result for Estimating Average Treatment Effects.” *Econometric Theory* 34, no. 1: 112–133. <https://doi.org/10.1017/S0266466617000056>.
- Smith, S. C. 1991. “On the Economic Rationale for Codetermination Law.” *Journal of Economic Behavior and Organization* 16, no. 3: 261–281. [https://doi.org/10.1016/0167-2681\(91\)90014-O](https://doi.org/10.1016/0167-2681(91)90014-O).
- Stata. 2023. *Inverse-Probability-Weighted Regression Adjustment (Tef-fects Ipwra)*. Stata. <https://www.stata.com/manuals/causalteffectsipwra.pdf> [Accessed 12 May 2025].
- Wenzelmann, F., S. Muehlemann, and H. Pfeifer. 2017. “The Costs of Recruiting Apprentices: Evidence From German Workplace-Level Data.” *German Journal of Human Resource Management* 31, no. 2: 108–131. <https://doi.org/10.1177/2397002216683863>.
- Wooldridge, J. M. 2010. *Econometric Analysis of Cross Section and Panel Data*. 2nd ed. MIT Press.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Supporting Information: bjir70030-sup-0001-Appendix.docx