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Abstract

This paper brings together two factors deemed important correlates of firm performance: advanced management practices and works councils. The country sample comprises nations where workplace representation is via a works council. The Management Questionnaire of the 2013 European Company Survey defines our full sample of mixed establishments (with and without councils) and its sister Employee Representative Questionnaire is used to derive a much smaller matched sample of works council plants. The outcome indicators are subjective measures of financial performance and the growth in labor productivity. For the full sample, we report that better management practices are strongly related to improved establishment performance, with no suggestion that works council presence influences that association one way or another. Works council presence is, however, negatively associated with financial performance and labor productivity growth. Distinguishing between councils based on managements' views of their type suggests that this negative association is likely attributable to unconstructive and delaying councils. Irrespective of works council type, the association between management practices and the performance indicators remains positive. Analysis of the smaller sample again confirms the favorable link between management practices and establishment performance. Circumstances in which the employee representative has a favorable view of the general work climate or expresses trust in management coincide with an improved financial situation if not higher productivity growth. Mutual distrust is negatively associated with financial performance situation but unrelated to labor productivity growth.

JEL-Codes: D220, J530, M500.

Keywords: management as a technology, work councils, works council type, financial performance, labor productivity growth, trust, mutual distrust, Germanic cluster.

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1 Introduction

Two of the more important concepts in labor economics and the contemporary management literature are the role of collective voice and management as a technology. The former notion, embracing employee involvement through unions or some other type of formal workplace representation, harks back to the early 1980s. The latter construct, involving the adoption of advanced management practices such as employee monitoring, financial incentives, and modern inventory control and workflow techniques, which also shelters under the heading(s) of management as a science (and managerial capital), is of more recent vintage and dates from the late 1990s. Collective voice and management practices are two presumed sources of higher productivity. The mechanisms are perhaps vaguer under collective voice (but inevitably also draw on high performance work practices which human resource literature is also related to the management practices model) even if its adherents might argue that the theory of voice is better developed. In any event, each model has separately garnered much empirical support in recent years.

The present paper investigates both models in a common performance framework. Given the (cross-section) nature of the data, and also partly because higher-scoring management practices are more common in plants *with* workplace representation, its goal is less one of choosing between the two mechanisms than it is to investigate the potential impact of each in the presence of the other. Moreover, we choose an environment that is a priori favorable to collective voice by focusing upon nations where the rent-seeking role of representation is widely acknowledged to be less prominent because the expression of collective voice is exclusively through the agency of works councils rather than union bodies. That is, our sample of countries conform to what is known as the *Germanic cluster* (Altmeyer, 2005), where works councils are pure worker representation bodies. Nevertheless, we do seek to identify different types of works council, based on supposedly more and less favorable characteristics such as the extent to which they are perceived by management as constructive or as a factor serving to delay important decisions, and to allow for different types of workplace. We choose to assess the role of better management practices (i.e. captured by an index) by examining their association with establishment performance both with and without work councils and in the presence of different types of councils.

Notwithstanding the plethora of research into the economic effects of worker representation upon performance and the burgeoning new literature on management practices as a science, the arms' length distance between the two research areas has meant

that the coexistence of workplace representation and what might be termed structured management practices has been little investigated.¹ One notable exception to this statement is the positive effect of RTW laws (for which read ‘weakened unionism’) on the development of management practices, and thence improved firm performance, recently reported in the management as a science literature (Bloom et al., 2019). On the other hand, other contemporaneous research has offered a more positive view of worker representation. One study has indicated that trust between the parties may be key to understanding the direction of association between worker representation and firm performance; while another, embracing the notion of affective commitment, has suggested that any negative influence of workplace representation on performance can be trumped by worker loyalty. Yet this more positive evidence is necessarily partial, the former research omitting management practices and the latter neglecting the role of trust.² The aim of the present paper is to help provide some of the missing links, which goal is facilitated by focusing on a sample of countries with a common model of worker participation based on the German works council or *Betriebsrat*.

The organization of the paper is as follows. We first offer a compact review of the distinct worker representation and management practices literatures. Next our dataset – 2013 European Company Survey – is examined, distinguishing between its Management (MM) and Employee Representative (ER) Questionnaire components, the broad samples they give rise to, and the manner of construction of the better management practices index and definition of works council type. These remarks are then formalized in presenting the modeling exercise. Our detailed findings, which are organized by full sample and matched sample, are next presented. The full sample analysis amends a baseline regression of firm performance on management practices and the presence (or otherwise) of workplace representation to incorporate types of representation based on management attitudes toward employee representation both as a matter of principle and practice. The matched sample analysis, now using works council establishments alone, exploits the perceptions of each side of the implicit trust and workplace climate variables. The ultimate expression of this exercise is the use of a dissonance measure, or indicator of

¹ On the association between the workplace representation and high performance work practices, see, inter al., Addison (2005); Gill (2009).

² See, respectively, Addison and Teixeira (2019, 2020).

distrust, allowing differences between the two sides in their opinions of the other to be incorporated in a single performance equation. A concluding section reviews our principal findings together with a reconciliation of their diversity.

2 Theoretical and Empirical Considerations

The literature on worker representation holds out the prospect that representation may shape the personnel policy of firms and contribute materially to their success, one key underlying premise being that workers have important private information and valuable insights into how to improve their jobs. The management practices literature on the other hand considers (at least some forms of) worker representation as a constraint on good management which is the source of better management practices and thence improved performance. Circumstances where this is not the case are simply not elaborated upon, although it is formally contested that better management comes at the expense of a good work-life balance for workers (see Bloom et al., 2009). We next consider each literature (in abbreviated form) in turn.

2.1 Worker Representation

The case for formal worker representation hinges on collective voice and was first applied to union representation (Freeman and Medoff, 1984). The expression of collective voice through employee representation can be pro-productive by solving an organizational failure (principal-agent, information asymmetry) problem. One route is by providing information that might otherwise be under-provided by reason of the public goods nature of shared working conditions at the workplace (e.g. safety, line speeds, and grievance procedures) as well as complementarities in worker effort inputs. By aggregating employee preferences and communicating them, and monitoring effort, unions can enable firms to select a more efficient mix of personnel policies. Inefficient outcomes may also be averted by the governance function of collective voice, which refers to the policing or monitoring of contracts that are incomplete, containing employer promises that are not explicitly spelled out in the contract of employment. With union representation, employers can be prevented from engaging in opportunistic behavior. Without it, the discipline exerted by the market through reputation effects may be too weak and workers will withhold some types of effort and forms of cooperation.³ Although employer

³ On the broader issue of inefficient market equilibria, see Levine (1995).

malfesance can be deterred by a union with credible threat power, that solution also presents a hold-up problem of its own. Recognition of this problem has provided the principal theoretical justification for *works councils* (Freeman and Lazear, 1995) if legal limits can be placed on the exercise of their powers. The advantages of works councils reside in their information, consultation, and participation rights that in principle facilitate the verification of management claims, capitalize on the non-overlapping information sets of management and labor, and, by offering improved job security, encourage workers to take a longer-run view of the firm, respectively. The two balancing constraints in the German case are prohibitions on the right to strike or to engage in wage negotiations (unless ceded authority to do so under the relevant collective bargaining agreement). It is in this sense that Freeman and Lazear speak of a potential decoupling of the factors that determine the size of the firm surplus from those that determine its distribution. Theory does not provide an unambiguous answer.

As far as the empirics are concerned, and focusing here on the German works council, the evidence is mixed.⁴ Although the entity has increasingly been credited with having a favorable impact on firm performance (e.g. Mueller and Stegmaier, 2017; Addison et al., 2017), this outcome would seem to depend on a variety of moderating influences. One such influence is whether the establishment is covered by a sectoral collective agreement, with some research suggesting that such coverage removes distributional conflict to the sectoral level, allowing the works council at local level to focus on production issues (Hübler and Jirjahn, 2003). Another is said to be the managerial environment, with some suggestion that establishments having a positive attitude towards employee participation record greater work council participation in decision making (Jirjahn and Smith, 2017). A third moderating influence might be the passage of time on the reasoning that the functioning of works councils depends on a learning process.

⁴ The union-firm performance nexus is yet more clouded, although there has been speculation of there being a hierarchy of productivity performance. On this view, unionized workplaces with innovative work practices are located at the top tier of the firmament of establishments – above non-union plants with the same set of practices – but are also positioned at the bottom tier (i.e. below non-union plants) for traditional workplaces. For an analysis of the hypothetical productive union workplace, see Black and Lynch (2001).

Moreover, case studies have revealed a range of industrial relations regimes characterized by cooperative or antagonistic relations between the German works council and management (e.g. Frege, 2002). Economic studies have taken up this heterogeneity issue. Perhaps the best known use a *one-time* question about the attitude of the works council in decision making asked of the manager respondent in the 2006 wave of the IAB Establishment Panel to investigate the impact of the entity on firm performance, human resource problems, and plant closings. Less adversarial although not necessarily consensual councils have been found to be associated with more favorable outcomes (see Pfeifer 2011, 2014; Addison et al. 2020; Arnold et al. 2018).⁵

Diversity of finding in the works council literature also reflects methodological issues associated with small samples, single data sources, and the frequent use of cross section analysis. Exceptions to this statement are studies of innovative work practices by Wolf and Zwick (2002) and Zwick (2004), using data from the German IAB Establishment Panel. Both studies seek to control for the endogeneity of human resource practices as well as unobserved establishment heterogeneity (using the two-step procedure of Black and Lynch, 2001, extended by instrumenting works councils and human resource innovations in the second step). In the former study, it is found that some management practices raise productivity while others do not. Specifically, organizational changes (comprising participatory practices such as teamwork) raise productivity but incentives (such as profit sharing) do not. Organizational innovations are associated with firms that have time invariant unobserved characteristics that reduce their productivity, while incentive mechanisms are introduced in times of plenty.⁶ For their part, works councils do not appear to influence the pro-productive practices but have a positive own ‘effect’ in the second-step panel procedure. The not dissimilar study by Zwick (2004) focuses only upon the organizational practices category but seeks to control for the endogeneity of works councils which now share equal billing with these innovative work

⁵ For somewhat more varied results from analyses of innovative work practices and firm performance in the German machine tool industry using similar measures of the degree of engagement of works councils in processes of technological or organizational change, see Dilger (2002) and Frick (2002).

⁶ Note that after correction for endogeneity the incentives variable is no longer statistically significant while organizational changes are statistically insignificant in cross section with or without correction for selection.

practices. Although the base finding with respect to organizational practices is unchanged, one (controversial) result is distinctive: innovations only bear fruit in work council establishments.

The main takeaway from this discussion is that there are theoretical grounds for supposing that collective voice (and high performance work practices) can improve the productivity of the workplace. However, although some might see little difference in the arguments for workplace representation and these innovative working arrangements when the industrial relations system offers some means for decoupling production from distribution issues, the links between the two mechanisms are not transparent in practice. For its part, the impact of works councils is evidently not a datum, while assessment of high performance work practices has historically been hobbled by a lack of longitudinal data such that it cannot be assumed that their frequency has changed materially over the study periods in question. And in situations where longitudinal data have been available, the architects of the new management as a technology literature would claim that, with important exceptions (e.g. Ichniowski et al, 1997), the evidence is “not robust in the time series dimension” (Bloom and Van Reenen, 2011:1757).

2.2 Management Practices as a Technology

This distinctive and surging body of research on management practices adopts a management as a technology approach, seeing at least some aspects of human resource management as *best practice*, whose incorporation would improve the technology of the typical firm. *Vulgo*: they are the right ones for *all* firms to adopt. That all firms do not adopt them is explained by inefficiencies, to include weak competition, poor governance in family-run businesses, labor market regulation, and, latterly (for the U.S.), learning spillovers and unionization (Bloom and Van Reenen, 2007, 2010, 2011; Bloom et al., 2019).⁷

Viewed alongside the analysis of worker representation and the ‘vast’ literature on work organization (Cappelli and Neumark, 2001: 738), the management as a technology approach is at first blush rather spare. Thus, as noted earlier, to the extent that

⁷ By contrast, under an alternative *contingent management* scenario, observed heterogeneity in the adoption of different practices is attributed not to inefficiencies but rather to explicit strategic choices by firms given the different environments that they face.

it recognizes formal workplace representation, this would seem to be as a constraint rather than a potentially positive influence. And while clearly influenced by the human resource management literature – most notably that component dealing with incentives and work organization – the measurement of management practices is guided more by the economics of management (and is indeed based on an evaluation tool developed by McKinsey) than human resource management theory. It is also seemingly the case that the management practice scores (see below) for rewarding workers for good performance typically fall below those for sanctioning underperformers (Bloom and Van Reenen, 2011: 1706). That said, greater employee supervision may produce higher motivation, employee effort, and job satisfaction, and Bloom et al. (2009) report that better management is strongly positively related with more generous childcare subsidies, work-life balance indicators, and self-assessed employee satisfaction.

In fact, the hallmark of the management practices as a technology approach is the use of a searching survey methodology to divine international patterns of management quality and thence address their antecedents and consequents. As described in Bloom and Van Reenen (2007), the World Management Survey (WMS) evaluation tool defines and scores some 18 management practices from 1 (worst practice) to 5 (best practice). (In econometric specification, the individual scores are converted from the one to five scale to z -scores with the unweighted average across z -scores serving as the main measure of overall management practice.) Abstracting from shop floor operations (e.g. the adoption of lean manufacturing techniques), the remaining practices are grouped into three main dimensions covering monitoring, targets, and incentives. The monitoring component seeks to assess how well companies track production and able to build upon this as a basis for continuous improvement, as well as the application of sanctions/rewards. Targeting focuses on the type, functionality, transparency, range and connectivity of performance indicators. That part of the survey dealing with incentives encompasses promotion practices, pay and bonuses, the treatment of star performers, and the firing/fixing of bad performers.

Scoring in the WMS proceeds using a sequence of open questions. That is, for each dimension managers are first asked a broad question followed by a series of further such questions linked to actual practices and examples until the interviewer is able to narrow things down sufficiently to make a determination of the firm's usual practices and fit them within the performance grid. The sampling frame of the first WMS in 2004

contained data on 732 randomly selected medium-sized firms from the United States, France, Germany, and the United Kingdom. The WMS has been administered in several waves since then, most recently in 2014 at which point the sample encompassed 11,383 firms in 34 countries.⁸ We note parenthetically that despite this impressive country coverage, three of the four EU nations examined in the present paper escape identification in the WMS.

From the outset the new management practices literature has paid careful attention to evaluating the quality of its survey data, seeking internal validation by resurveying firms and external validation by matching the data with information on firm accounts and stock market values from independent data sources in a methodology that “combines the econometric advantages of large sample surveys with the measurement advantages of more detailed case study interviews” (Bloom and Van Reenen, 2007: 1391). A key descriptive finding has been the large spread in management practices across firms *and* countries, with a large tail of very low scoring firms. Attention has focused on explaining this variation in management practices and on the consequences of poor management practices.

Bloom and Van Reenen (2007) examine these issues using management practice data from the first wave of the WMS. The authors report that poor management practices are a combination of weak product market competition, allowing their persistence, and family firms passing management control down by primogeniture. Taken together, product market competition and family firms seemingly account for approximately one-half of the long tail of badly managed firms and for respectively one-half and one-third of the French and British management gaps vis-à-vis the United States. In turn, better management practices are strongly associated with superior firm performance; specifically, in labor productivity, the rate of return on capital employed, Tobin’s Q , (reduced) firm deaths, and the average annual growth rate in sales.

⁸ A new *closed-question* mandatory survey of structured management practices, the Management and Organizational Practices Survey (MOPS), was fielded for the U.S. in 2011 and 2016 as a supplement to the 2015 and 2017 Annual Survey of Manufactures. The survey design is based on the WMS but also includes questions on other organizational practices such as decentralization (see Bloom et al., 2019: 1652-1655). A German Management and Organizational Practices (GMOP) survey containing data for 2008 and 2013 on 1,927 establishments with more than 25 employees was conducted in 2014-15 (see Broszeit and Laible, 2017).

A wealth of subsequent studies has further investigated the sources of differences in management practices across firms and countries and the relationship between management scores and firm performance using both the updated WMS and the new WOPS for the U.S. In addition to product market competition and family ownership, research has identified multinationals, exporters, the human capital of managers or of workers, information diffusion, and (loose) labor market regulation as sources of improvement in management practices. A very recent study by Bloom et al. (2019), using U.S. data from two waves of the new MOPS dataset covering 35,000 firms in 2010 and 2015, focuses on two of these ‘drivers’ in the form of right-to-work (RTW) laws and learning spillovers from the entry of large plants (and in particular multinationals). Among the key reasons for the authors’ choice of these arguments are the availability of plausible causal identification strategies.⁹ The passage of RTW laws is found to increase the adoption of structured management practices, while learning spillovers proxied by the arrival of large new entrants in the winning county increase the management scores of incumbent plants. The former result can be couched equivalently in terms of union weakness. Indeed, noting that RTW legislation increased structured management practices bearing on pay, promotion, and dismissals but had little effect on other practices, Bloom et al. (2019: 1670) argue that “unions frequently oppose (the former) such practices, which they believe give too much discretion to managers, so if unions are weakened by RTW then these incentives will likely become more prevalent.” The authors also examine the effect of management practices on firm performance. They report a sizable productivity-management differential: increasing structured management from the tenth to the ninetieth percentile accounts for some 22 percent of the parallel spread in productivity. Management practices are also highly predictive of increased firm survival rates and faster growth. Both sets of findings are corroborated in studies using the updated WMS data. Thus, for example, Bloom et al. (2017) verify the positive influence of management practices upon performance while confirming the role of greater competition as a spur to better management practices for the 34 countries in their sample.

⁹ In the case of RTW the identification strategies are difference-in-differences and a spatial regression discontinuity design. For learning spillovers, the technique has a basis in the competition between counties to attract ‘million-dollar plants,’ exploiting differences between winners and the immediate runners up.

Another branch of the management practices literature and the has focused on the contribution of management ability to successful management practices. Decomposing earnings into their worker- and firm-specific components, Bender et al. (2018) run production functions containing, in addition to management z-scores, measures of mean employee ability (the mean level of the individual worker fixed effect), mean management ability (taken from the top quartile of the worker ability distribution as there is no manager classification in these data) and the firm-specific wage premium. With the introduction of the worker- and firm-fixed effects the positive effect of management scores is reduced but it remains statistically significant. In their preferred total factor productivity specification, the authors address the component contributions of the worker and firm fixed effects to the (30 percent) reduction in the management score produced by their inclusion. As regards the contribution of employee ability it is the unobserved component of human capital for managers at the firm that matters most, with only a small fraction being accounted for by the higher human capital of the average employee at better-managed firms. In other words, managerial human capital substantially underpins successful management practices.

The foregoing suggests that the interpretation of management as a technology has made very considerable strides in advancing our understanding of one key correlate of establishment performance. Indeed, more recent developments in the new literature have made further advances in seeking to provide causal evidence on the effectiveness of management practices using field experiments of performance monitoring and targeting (Gosnell et al., 2020); in establishing the mechanisms through which management strategies affect firm export performance (Bloom et al., 2020); in investigating how management practices and management quality facilitate the purposive selection and sorting of managers and production workers across firms deemed so pro-productive by modern labor economics (Cornwell et al., 2019); and in providing further insights into why firms do not adopt best practices, to include their differentiated access to skills (as proxied by their distance from universities) which are shown to be complementary with management practices (Feng and Valero, 2020). Nevertheless, it remains a partial view of organizational behavior. Meantime, a review of the wider high performance work practices literature would suggest that worker representation merits serious consideration alongside management practices as either contributing to or detracting from

organizational competitiveness.¹⁰ More narrowly, in selecting the Germanic cluster as our country sample, we are working with a relatively homogeneous group of nations in which worker representation is widely viewed as more likely to have a cooperative relationship with management. What does this first look at the evidence suggest?

3 Data

Our establishment-level data on the Germanic cluster is extracted from the 2013 European Company Survey (ECS) available at <https://www.ukdataservice.ac.uk/>. The raw dataset comprises two components, the Management Questionnaire and the Employee Representative Questionnaire. They are provided in two separate files, which we shall refer to as the MM and ER surveys, respectively. The MM survey is based on responses of the most senior official responsible for human resources management and provides information on a wide set of establishment characteristics, including workforce composition and several organizational features on the one hand, and management's view of establishment performance, the general work climate, and the role of the workplace representation body, on the other. And of particular relevance to the current inquiry, it also contains detailed information on a variety of management practices which will be detailed below. For its part, the ER questionnaire is based on the responses of the representative of the prevalent employee representative body at the workplace and provides information on that body's views on management behavior and the work climate at the establishment, as well as the composition of employee representation *inter al.*

The required information on employee representation is based on the management response to the specific question on employee representation structure present at the establishment. Our focus is upon *formal* representation, which in the case of the Germanic cluster exclusively takes the form of a works council. There is also information on informal representation which refers to any *ad hoc* form of worker representation (e.g.

¹⁰ Only one management practice study of which we are aware directly incorporates worker representation. Broszeit et al. (2019), using data from the GMOP and administrative data from the IAB Establishment History Panel, regress labor productivity on management scores and a vector of establishment controls including works council presence. Greater management quality translates into higher value added per worker (albeit at roughly one-half the U.S. rate) and works council presence is strongly positively related with this measure of productivity. The management quality-productivity relation obtains throughout. The work council relation is robust across components of the management index but does not obtain in large firms ($n > 250$) or when using commercial data on productivity.

pure occupational safety and health committees). Informal representation may therefore be present alongside a formal body in which case the establishment is coded as having a formal representation. Otherwise, it is coded as an establishment without formal (works council) representation.

The Germanic cluster dataset is made up of 3,951 establishments with valid survey responses. Of this total, approximately 50 percent have a works council, the presence of this entity being higher in Netherlands and Luxembourg (circa 70 percent) and lower in Austria and Germany at 46 and 32 percent, respectively.

Management practices are extensively covered in the MM survey and we have selected five main domains which are summarized in Appendix Table 1. Specifically, they comprise domain 1-Work organization practices and monitoring (3 items); domain 2-Team working (1 item); domain 3-Performance appraisal (1 item); domain 4-Incentive/performance-based pay (5 items); and domain 5-Employee involvement (7 items). We note that two possible additional domains are not included in this set, namely domain 6-Skill development/training and domain 7-Provision of information to employees and participation in decision making. The exclusion of domain 6 is justified because the Management Questionnaire only provides information on the proportion of employees who receive on- and off-the-job training, not on the qualitative nature of the schemes. In the case of domain 7, the information is based on the subset of establishments that experienced a major organizational change (since 2010), an extra restriction that implies a further reduction of approximately one-third in the size of our MM-ER matched sample. Full information on each of the selected 17 management practices contained in domains 1 to 5 is provided in Appendix Table 2A, which also presents the coding of all generated variables used for estimation purposes.

Appendix Table 2B presents the distribution of management practices across establishments with and without a works council, the former being further disaggregated into two works council *types* denoted as ‘constructive’ and ‘non-constructive’ councils. This constructive/non-constructive classification is based on the raw question ER15A, which asks the management respondent whether the *employee representation helps in a constructive manner to find ways to improve workplace performance*. As described in Appendix Table 3, the generated dummy variable is based on the raw variable er15a which is constructed by allocating ‘strongly agree’ and ‘agree’ responses to yield the *constructive* works council category.

In panel A of Appendix Table 2B, management practices have a lower incidence in non-works council establishments (shown in the first main column) than in the case of *constructive* works council (second main column) as the percentage of establishments in which the practice is absent (coded as ‘0’ in Appendix Table 2A) is always higher in the former. For *non-constructive* works councils, we observe that in most cases the practices are absent in a lower percentage than in non-works council establishments. However, there are exceptions as in the cases of ‘regular staff meetings,’ ‘suggestion schemes,’ and ‘employee surveys.’ In panel B, which reports the case of performance appraisal, an ordered variable on a 0 to 6 scale in ascending order of employee coverage, there is again evidence that the practice is more often found in constructive works councils. To illustrate, 55 percent of constructive works councils implement a performance appraisal (or an evaluation interview) for 100 percent of their workforce force, as compared with 50 percent in the case of both non-works council and non-constructive works council establishments. Conversely, only 5 percent of constructive councils have 0 percent of employees not evaluated versus 8 and 17 percent in the case of non-constructive and non-works council establishments, respectively.

Alternatively, the works council type may be constructed on the basis of the raw variable *er15b*. In this case, the management respondent is asked whether the *involvement of the employee representation often leads to considerable delays in important management decisions*. This alternative implementation, which is remitted to Online Table 2B, shows that for every single management practice the percentage of establishments in which the practice is absent is always higher in non-works council regimes than in works council regimes (whether delaying or non-delaying).

Our selected management practices as described in Appendix Tables 1 and 2 are ordered variables on either 0-1, 0-2 or 0-6 scales and are strictly generated from the raw MM survey. To assure a common scale across different items, we follow Bloom and Van Reenen (2007) and standardize all the generated variables. In the case of domain 1, for example, which contains 3 items, each item is standardized using the mean and standard deviation across all establishments. A single indicator is then constructed by taking, for each establishment, an unweighted average of the corresponding three z-scores. A similar procedure is used for all the other four domains. To obtain an overall, single-indicator of management practices for each establishment we took the unweighted average across all single-domain indicators. In practice, this procedure generates both single-domain and overall indicators of mean zero. We also constructed an alternative overall management

practice index based on a simple ‘row total.’ In this last case, we simply summed all the raw scores observed at establishment level to obtain a single index that is contained in the 0-25 closed interval. Our regression analysis in section 5 will focus exclusively these two overall indexes. Although several other alternative approaches could have been implemented (e.g. single domains in separate regressions) evidence from other studies (e.g. Bloom and Van Reenen, 2007) suggests that the results are not sensitive to the introduction of different summary measures.

The information on establishment-level performance is based on management response regarding the financial situation of the establishment. The answer is coded on a 1 to 5 scale in ascending order (from ‘very bad’ and ‘bad’ through ‘neither good nor bad’ to ‘good’ and ‘very good’). We also collect information on labor productivity growth and generate an alternative performance measure that evaluates the establishment’s current labor productivity in comparison with the situation three years earlier. The corresponding variable is coded on 1 to 3 ascending scale, denoting that labor productivity has ‘decreased,’ ‘remained the same,’ and ‘increased,’ respectively.

Establishment-level characteristics are also extracted from the MM questionnaire and include sector (industry) affiliation, establishment size (number of employees), single versus multi-establishment organization, as well as workforce composition by skill and occupation, and type of wage collective agreement. These controls are described in Appendix Table 3.

Finally, a key aspect of our analysis is the possible misalignment in management and employee (representative) views on the overall work climate and trust in one another. To this end we need employee representative responses to the ER questionnaire. Specifically, the respondent (i.e. the person who is entitled to represent the opinions of the leading employee representation body at the workplace) is asked to rate the current general work climate at this establishment (raw variable q44). The respondent is also asked whether *management can be trusted* (raw variable q42a_c) and whether the *relationship between management and employee representation can best be described as hostile* (raw variable q20c). By matching management and employee (representative) statements, we may then define a dissonance variable as the difference between the views of the two parties. In fact, several alternative formulations of dissonance will be considered, as documented in section 4. The ER survey also contains information on union density of the employee representation body and the union density at establishment level. These aspects will be further discussed in section 5.

4 Modeling

In order to analyze the role of management practices and establishment performance under different types of workplace representation, we use the following multilevel mixed effects ordered logistic model specification:

$$Pr(y_{ij} > k | X_{ij}, M_{ij}, \boldsymbol{\kappa}, \mathbf{u}_j) = H(X_{ij}\beta + \delta M_{ij} + \mathbf{u}_j - \kappa_k), \quad (1)$$

where $H(\cdot)$ is the logistic cumulative distribution function, y_{ij} is the selected (ordered) performance measure, M_{ij} signifies the overall management practice index, and i and j identify the establishment and country, respectively. κ_k denotes the cut-point for the corresponding firm performance category k , with $k = 1, 2, 3, 4, 5$ for the financial situation response and $k = 1, 2, 3$ for the labor productivity case. \mathbf{u}_j gives the set of country random intercepts, while X_{ij} is the vector of establishment characteristics.

This model is extended to encompass the presence of formal workplace representation. Denoting this (dummy) variable by R , and introducing the corresponding interaction term with the management practice variable (M), we have:

$$Pr(y_{ij} > k | X_{ij}, M_{ij}, R_{ij}, \boldsymbol{\kappa}, \mathbf{u}_j) = H(X_{ij}\beta + \delta M_{ij} + \lambda R_{ij} + \eta M_{ij} * R_{ij} + \mathbf{u}_j - \kappa_k). \quad (2)$$

In this setting, the absence of a works council is the omitted category.

We also seek to investigate the nature of industrial relations at the workplace. As mentioned above we (first) use the information on management's views on workplace representation contained in raw variables er15a and er15b, in separate runs. In the former case, we define three establishment groups: with a constructive council, with a non-constructive council, and without a council (the reference group), while in the latter we have establishments with a delaying council, with a non-delaying council, and without a council (the reference group). For each separate run, the corresponding model can therefore be specified as:

$$Pr(y_{ij} > k | X_{ij}, M_{ij}, R_{ij}, \boldsymbol{\kappa}, \mathbf{u}_j) = H(X_{ij}\beta + \delta M_{ij} + \sum_l \lambda_l R_{lij} + \sum_l \eta_l R_{lij} * M_{ij} + \mathbf{u}_j - \kappa_k), \quad (3)$$

where subscript l denotes the *type* of works council.

Based on er15a and er15b we also implement an alternative formulation where the information on these two variables is combined in a single framework. In terms of the regression model this amounts to creating three establishment groups: establishments without councils; establishments with councils that are, again in management's assessment, constructive and/or not implying delays in decisions; and establishments with councils that are both non-constructive and delaying (the reference group). In this schema

the goal is to isolate the patently most negative case, flagged by the doubly unfavorable management's assessment. The model specification is similar that given in equation (3) above.

Next, we introduce the employee representative view on industrial relations at the establishment. Given that not all workplace representation bodies, identified by the management respondent, were actually interviewed (by reason of missing private address, refusal to answer, etc.), the number of useable observations is necessarily smaller in this case than in the models (1) through (3) above. There is also the additional limitation arising from the fact that the ER and MM datasets are provided in separate files, thus requiring some merging procedure that further reduces the sample. For estimation purposes our sample comprises 468 observations with MM-ER merged information. By construction all establishments necessarily have formal workplace employee representation and the corresponding model specification contains a 1/0 dummy flagging the type of industrial relations as perceived by the employee representative, namely whether management can be trusted or not. In separate runs we introduce two alternative dummy variables denoting the type of management-employee representation relationship (hostile or otherwise) and whether the general work climate is good or very good. In his case the model specification resembles equation (2) above to yield:

$$\Pr(y_{ij} > k | X_{ij}, M_{ij}, R_{ij}, \boldsymbol{\kappa}, \mathbf{u}_j) = H(X_{ij}\beta + \delta M_{ij} + \lambda R'_{ij} + \eta M_{ij} * R'_{ij} + \mathbf{u}_j - \kappa_k), \quad (4)$$

where R' denotes the works council type dummy.

Finally, we use a measure of dissonance or deviation between the two parties. In this case, we have establishment performance as a function of an indicator that is presumed to reflect some underlying dysfunction at the organization *and* less prone to feedback and reverse causation. As noted earlier, we will experiment with several indicators which are fully detailed in the findings section. Our preferred version contains two dissonance variables, Dissonance_1 and Dissonance_2. For Dissonance_1 we have the cases in which management rates the work climate as good or very good and the worker representative states that the work climate is bad, very bad, or neither good nor bad, whereas Dissonance_2 covers the cases where the stance of each party is reversed. These two terms give then the differentiated effects of each type of dissonance vis-à-vis the reference category of no dissonance. The cases in which both parties rate the work climate as bad, very bad or neither good nor bad are discarded from the sample. The corresponding model can be then specified as:

$$\Pr(y_{ij} > k | X_{ij}, M_{ij}, R_{ij}, \boldsymbol{\kappa}, \mathbf{u}_j) = H(X_{ij}\beta + \delta M_{ij} + \lambda_1 \text{Dissonance_1}_{ij} + \lambda_2 \text{Dissonance_2}_{ij} + \mathbf{u}_j - \kappa_k). \quad (5)$$

In the regression tables provided below we shall report both the coefficient estimates and marginal effects, the latter being obtained by fixing the random effects at their theoretical mean (i.e. zero) and all control variables at their sample mean.

5 Findings

Table 1 provides the results from model (1), using the two selected performance indicators, the financial situation and labor productivity growth, in columns A and B, respectively. Clearly management practices are associated with higher performance throughout. In column A, for example, a 1-unit change in the overall index of management practices is associated with a better than 7 percentage point higher probability that the financial situation is ranked as the highest (i.e. outcome-category 5). The same change in the overall index in column B is associated with a 16 percentage point increase in the probability that labor productivity is higher than the level observed three years earlier (outcome-category 3). These are sizable marginal effects and they are in both cases statistically significant at the 0.01 level. Conversely, the marginal effects are negatively signed in the case of outcome categories 1 to 3 (1 to 2) in column A (column B) and again highly statistically significant. Only the marginal effect for outcome-category 4 in column A is poorly determined.

[Table 1 near here]

We control for a variety of establishment-level characteristics. Although we do not in general have strong priors as to their expected relationships with establishment performance, it was nonetheless surprising that type of collective agreement and composition of the labor force did not exhibit stronger significance. In the case of the former argument, however, it might be argued that the raw variable is not as well suited to capture actual differences in collective bargaining across establishments as the more conventional categories of *individual agreement/no collective agreement*, *firm-level agreement*, and *sectoral-level agreement*. That said, experimentation with an alternative collective agreement variable left the results unaffected.¹¹ We might also note that the

¹¹ Under a number of assumptions, it is possible to generate the alternative classifications of *no collective agreement*, *firm-level agreement*, and *sectoral-level agreement* (rather than *no collective agreement*, *company-level agreement*, *higher than company-level agreement*, and *mixed-level agreement* as in Appendix Table 3). For example, one can aggregate sector/regional and national cross-sectoral bargaining levels into a single ‘sectoral category.’ But in this and other experimentation the firm-level and sectoral level variables proved uniformly insignificant.

results continued to hold when we restricted the sample to establishments in the private sector. Our findings are therefore not sensitive to the inclusion of the public sector.

Table 2 addresses the role of workplace representation both autonomously and in interaction with management practices. With respect to the latter association, we found no evidence that an increase in the management score single index is associated with higher performance in works council establishments than establishments without a council as the corresponding interaction term in the third row of the table fails to achieve significance. Nor did we find in column A that works councils are associated *cet. par.* with an improved financial situation. Indeed, in column B we find that the entity is negatively associated with labor productivity. In comparison with Table 1, the coefficients estimates for the control variables are largely unchanged. We also observe that in both Tables 1 and 2 the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. Controlling therefore for country heterogeneity in our multilevel mixed effects framework reveals that the country (random) intercepts are statistically different across the four countries in the Germanic cluster.

[Table 2 near here]

The unorthodox result that works councils are not positively associated either with establishment financial performance or labor productivity lead us to examine whether the type of works council has any role to play. To this end, we next exploit the notion of constructive (or otherwise) works councils, using raw variable *er15a*, and compare outcomes with an absence of workplace representation. The intention of this exercise is therefore to go beyond the simple works council presence argument to impart some sense of works council heterogeneity/quality. As shown in column A of Table 3, there is now an indication that only non-constructive councils are correlated with an inferior financial situation compared with the default. But there is still the suggestion in column B that labor productivity growth is lower on establishments with councils, irrespective of their supposed quality (either constructive or non-constructive). Notably, the management practices term remains positive and highly statistically significant in both columns of the table.

[Table 3 near here]

We note that these results are unchanged if we replace the raw variable *er15a* by *er15b* as the selected indicator of works council quality. It will be recalled that in this case councils are perceived by management as delaying important management decisions (or

otherwise). In this experiment (reported in Online Table 3), the estimated coefficients and statistical significance obtained in Table 3 are largely unchanged; that is, the coefficient on delaying councils is negatively signed and significant, while the coefficient on non-delaying councils is negative and insignificant (other than in the case of labor productivity growth). Alternatively, one may also seek the combination of the two raw variables er15a and er15b to devise a hybrid variable that flags a situation where workplace representation is viewed in particularly unfavorable light by management, being both non-constructive in finding ways to improve workplace performance and acting to considerably delay important management decisions. This case has, then, the potential to provide a more decisive or clear-cut works council category (albeit as perceived by management alone).

As shown in Table 4, it is apparent that both establishments without councils and establishments with constructive and/or not delaying decisions councils are associated with higher financial performance than establishments that are both non-constructive and delaying decisions (the reference group). What seems interesting in this case is the finding that the two coefficients are not statistically different ($\chi^2=0.76$; p-value=0.3823). This result suggests that as long as works councils are not perceived as too disruptive, the difference in performance across works councils and non-works council establishments is statistically negligible.

[Table 4 near here]

In the case of column B, we reject the null at the 0.05 level that the two workplace representation terms have equal coefficients. In this case, the coefficient on constructive and/or not delaying is positive but not significant, while the coefficient on non-works council establishments is positive and significant but only marginally so (at the 0.1 level). It seems therefore that contrary to the previous results Table 4 provides no strong evidence that councils are negatively associated with lower labor productivity growth if the comparator is given by establishments in which the works council is both unconstructive and delaying.

Now all of these results have a basis in management's unilateral view of the works council. Before introducing employee-based views, let us return to the management practices argument and briefly comment on the sensitivity of the results to the use of the alternative indicator based on raw scores rather than z-scores. The results of this exercise are given in Appendix Table 4. Here Table 2 acts as the benchmark, namely the simple case in which financial performance and labor productivity growth are modeled as function of management practices and works council presence (although the interaction

term is now omitted as it was never statistically significant). The main conclusion is that the results obtained in Table 2 continue to hold. That is, management practices are both positive and highly significant throughout, while the coefficient on the works council dummy is negative and insignificant in column A and negative and highly significant in column B. Given that the overall management indicator is now contained in the 0-25 interval, we have the result that a 10-point increase in score from 10 to 20 is associated with a 7 (16) percentage point increase in the probability that the financial situation (labor productivity growth) is the highest. These are again sizable – and comparable – effects. Moreover, there is no suggestion that the findings are particularly sensitive to the use of this alternative management indicator.

We next introduce the views of employees as provided by the works council respondent to the ER questionnaire. Note that by construction we are now restricted to establishments with formal workplace representation.¹² The model in Table 5 specifies establishment performance as a function (inter al.) of management quality as perceived by the employee representative at the establishment. More specifically, the model uses the raw variable `q42a_c` to generate an indicator of employee trust, indicating whether management can be trusted or otherwise. It can be seen for this subsample of works council establishments that financial performance is strongly associated with employee trust, with a marginal effect equal to 0.12 at the highest level of performance. Note that the coefficient on the overall indicator of management practices is positive and of similar magnitude as in Table 2, for example, albeit in this case only statistically significant at the 0.10 level. The reduced level of significance might conceivably be explained by lower variability in the management indicator, which is smaller in this sample of works council establishments than for the full sample of establishments with and without councils, as well as by the substantial fall in the size of the estimation sample. In any event, observe that the corresponding management practices coefficient in column B is not only positive, as expected, but also highly significant and large in magnitude, implying substantial

¹² We should note in passing that in the spirit of the our earlier analysis of the MM sample we also examined – this time for the matched sample – whether works councils in which a majority of councilors were union members differed from their counterparts where they were in a minority. This dummy for works council type was statistically insignificant in both performance equations. Replacing the dummy by the actual percentage of councilors who were union members produced no change no change in the results.

marginal effects that are comparable with the corresponding estimates provided in Tables 1 through 4.

[Table 5 near here]

However, the results in column B of the table fail to indicate any relationship between employee trust in management and labor productivity. This is a surprising result and we have no explanation at this stage other than the limitations attaching to any one-sided measure of the state of industrial relations, irrespective of its source. As a preliminary check, we tested whether the lack of statistical significance of the employee trust argument in the labor productivity performance equation was sensitive to the use of this particular measure. That is, we experimented with alternative employee representative views; specifically, as to the nature of the relationship between the two sides (hostile or otherwise) and of the quality of the general work climate at the establishment (based on raw variables q20_c and q44, respectively, which are described in Appendix Table 3). In the case of the first alternative, the coefficient estimate of the management indicator increased slightly to 0.818 and remained highly statistical significant, while the employee trust indicator remained insignificant. For the second alternative, the management practices coefficient maintained its size and significance levels while the employee trust variable remained insignificant. These results are given in Online Tables 5A and 5B.

The results thus far suggest that one-sided qualitative measures, either from management or labor, while instructive on the role of industrial relations may not be sufficient to reveal the nexus between firm performance and management practices. Furthermore, given that both management and employee representative views are potentially endogenous, the empirical models in Tables 1 to 4 cannot of course establish any causal relationship. Thus, for example, a superior financial situation is likely to influence management's opinion on whether workplace representation is constructive or not. And although reverse causation is less of a problem in the case of the employee representative view of management, one cannot exclude the possibility that a good establishment performance is also likely to favor employee representative opinion that management can be trusted.

By way of response, we sought an alternative implementation that explicitly exploits the notion of dissonance, that is, the difference between the views of management and the employee representative. Our strategy assumes that dissonance and non-dissonance cases are sufficiently distinct from one another to permit identification of a

relevant parameter, so that the issue becomes one of whether dissonance between the two parties matters. Our constructed variable is intended to signal the extent to which there is evidence of a lack of mutual trust, the crucial point being that although non-dissonance may not be synonymous with genuine trust it is nonetheless likely to be sufficiently distinct from dissonance. The construct offers the advantage of potentially capturing a more fundamental notion of disaffection – or lack of mutual trust – and as such expected to *imply* weaker performance.

As described in section 4, our first measure of dissonance uses management and employee representative views on the general climate at the establishment. The results of this experiment are given in Table 6, which therefore models establishment performance as a function of management practices and dissonance, while controlling for the same set establishment characteristics as before. It will be recalled that the model contains two dissonance variables – Dissonance_1 and Dissonance_2 – to differentiate the two possible types of misalignment between the parties against the reference category of no dissonance.

Firstly, we note that the management practices coefficient remains positive, large, and significant (at the 0.05 level) in column A of the table. The marginal effects for outcome-categories 1 through to 5 are also of similar magnitude. Secondly, both types of dissonance are negative, indicating that they are seemingly harmful to financial performance, with the Dissonance_2 term evincing both larger marginal effects and higher statistical significance. Based on the estimated coefficients, the measured deviation (or dissonance) of type 2 implies a substantially lower probability of achieving the highest performance category (outcome-category 5) of -16 percentage points. The marginal effect for the Dissonance_1 term is smaller in absolute magnitude at -9.3 percentage points. Both effects are sizable and are supportive of our priors.

[Table 6 near here]

In column B of Table 6, we also report a positive and significant coefficient estimate for management practices, while the corresponding marginal effects are again large in magnitude. However, none of the dissonance terms is statistically significant at conventional levels. The suggestion found in column B of Table 5, that the growth in labor productivity does not seem sensitive to the employee representative view on the quality of industrial relations seems therefore to be confirmed. In addressing management's assessment of works council type in column B of Table 3, it will also be

recalled that neither type of works council (constructive or non-constructive) was statistically different.

One important point that needs to be emphasized is that the results obtained for labor productivity growth in column B of the table are not sensitive to the use of alternative measures of dissonance. From the perspective of the management respondent let us consider the alternative based on the raw variable er15e, which indicates whether management trusts the employee representation. For the employee respondent, we consider two alternatives, based on whether management can be trusted (raw variable q42a_c) and whether the relationship between management and the employee representation can be described as hostile (raw variable q20_c). On this basis, we have six alternative constructions of dissonance between the parties, given that each of the two possibilities for management assessment of the quality of industrial relations (KCLIMATE and er15e) can be combined with three different possibilities regarding the employee representative (q44, q42a_c, and q20_c). (The dissonance measures are defined in Appendix Table 3.) The case in Table 6 above is therefore just one in six, and one wonders whether the reported results are the exception or rather the rule. The raw variables contain different subsets of information (the notions of ‘general work climate,’ ‘trust,’ and ‘hostility’ are only rough counterparts), and therefore one cannot necessarily anticipate that each will generate similar results. As a practical matter, the shares of Dissonance_1, Dissonance_2 and No dissonance (the reference category) vary quite substantially across experiments.¹³ In any event, since the alternative constructs are designed to capture some differentiated type of dissonance, and given that it is one thing to share a positive view regarding the other side’s behavior or attitude yet quite another to show transparent deviation, identification of the parameter of interest in the successive scenarios remains the crucial issue.

Space constraints are such that only a brief summary of the remaining five cases can be offered here. In the case of the financial performance, the management practices term is always positive and of similar magnitude; and it is significant in four out of five cases. In turn, Dissonance_1 and Dissonance_2 are always negative, and in all cases except one either Dissonance_1 or Dissonance_2 is significant at the conventional levels.

¹³ In Table 6, Dissonance_1 and Dissonance_2 comprise 23 and 9 percent of the cases, respectively. In Online Tables 6A-6E, the corresponding shares vary between a minimum of 5 and a maximum of 28 percent, and between 4 and 18 percent.

In the case of the labor productivity growth outcome, the management practice coefficient is always positive and significant at the 0.01 level. As in Table 6, Dissonance_2 is never significant at conventional levels, while Dissonance_1 is insignificant in three out of five cases. In sum, there seems to be considerable stability in the results, and no real evidence to indicate that they are overly sensitive to the use of any particular construct. The full results from these alternative scenarios are available in Online Tables 6A through 6B.

6 Conclusions

This paper looks at two factors widely viewed as important determinants of establishment performance, namely advanced management practices and worker representation at the workplace. Yet despite their appeal as drivers of performance the two factors have to all intents and purposes not been considered together. The present paper is among the first to consider the two factors alongside one another even if it does not formally explore their interplay other than via the use of interaction terms. Rather, its concern has been to examine the association between each argument and (two measures of) firm performance in the presence of the other. Moreover, the cross section nature of our dataset necessitates that we avoid use of the word ‘effect’ but this limitation has to be seen against the backdrop of the highly influential management practices literature that long had to eschew offering a causal interpretation of its stark findings of a highly significant positive association between management practice scores and labor productivity growth, inter al. Causation issues have also loomed large in the separate workplace representation literature not least because of the lack of variation over time in the entity in question and the joint presence of both principal forms of worker representation, namely works councils and trade unions. In the present paper, we restrict our attention to countries with a unique form of workplace presentation – namely works councils in the ‘Germanic cluster’ of nations – but nonetheless seek to differentiate between types of works councils as well as the types of establishments in which they operate. The four countries in our sample have exemplary forms of workplace representation from a theoretical perspective even if the empirical terrain is still contested. The management practices of the country with which they are identified, Germany, also has been shown to have superior management practices in the WMS literature, practices that are associated almost without exception with improved performance.

Turning to our findings, the study uses data from the two components of the 2013 European Company Survey. The Management Questionnaire is used to define our full

sample of mixed establishments (that is, containing both works council establishments and those without any formal representation) and the Employee Representative Questionnaire to derive a much smaller matched sample of solely works council plants. Our findings it will be recalled pertain to the correlates of subjective measures of financial performance and the growth in labor productivity. For the full sample, we report that management practices are strongly positively related to both performance indicators, although there is no indication that the introduction of a simple work council variable – works council presence versus its absence – influences the association between management practices and performance. Its own correlation with both outcome indicators is negative (and significantly so in the case of labor productivity growth). Moving beyond the simple presence of a works council (or otherwise), we first considered separate sets of works councils as either constructive in helping management to improve workplace performance (or otherwise) and alternately as leading to considerable delays in decision making (or otherwise). The reference category – establishments without a works council – was unchanged. The results for labor productivity were statistically significant negative coefficient estimates across the board, and on this occasion the financial situation was inferior only in circumstances where the works council was either unconstructive or delay inducing. We next combined both negatively perceived council characteristics to yield a uniquely unfavorable works council type (both unconstructive and delaying) as the reference category. This specification effectively rendered the revised works council (constructive and/or nondelaying) coefficient estimate insignificant at conventional levels in the productivity growth equation and positive and statistically significant in the equation for the financial situation equation (and importantly not statistically different from the coefficient estimate for the no works council case). Accordingly, we obtain a more balanced and less challenging view of works council operations once we differentiate between works council type. No less important was the result that the association between management practice score and both performance indicators was effectively unchanged across all these iterations.

Analysis of the smaller sample, comprising works council establishments alone, confirmed the association between management practices and firm performance, especially in the case of labor productivity growth. Interestingly, the specific results on worker representation are not overly sensitive to measures of type of works council, this time based on the views of the employee representative of their trust in management or assessment of the general work climate. A favorable view of the general work climate at

the establishment and an expression of trust in management were associated with an improved financial situation, if not higher productivity growth. Despite these less challenging set of correlations, we sought to take the views of management and labor into account; specifically, diametrically opposing views of the two sides as to the climate of industrial relations at the workplace (the reference category being mutual agreement on a positive relationship). We found that each form of ‘dissonance’ had a strongly negative effect on financial performance. Further experimentation with dissonance measures fashioned from other combinations of employer and employee perceptions of the functioning of their relationship offered some support for the baseline results that dissonance was negatively related to the financial situation but basically unrelated to labor productivity growth.

Looking at the results for both samples, the support for the predictions of the management as a technology argument are surprisingly strong, subject to the usual caveats on causality. As far as works councils are concerned, however, the results are frankly less bullish. To be sure, one can counter the suggestion that works councils have a uniformly negative association with establishment performance once one abandons the simplistic belief that the entity is a datum, and for that matter help dispel the notion that the union affiliations of works council members or of the workforce underpin negative results where observed. But one might have expected somewhat stronger findings than we have been able to uncover here on the functioning of an exemplary voice institution in nations predisposed to the expression of collective voice – possibly for reasons that they favor the expression of *all* types of voice.

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Table 1: Establishment Performance and Management Practices (MP) in the Germanic Cluster

Variable	Outcome (Establishment performance)									
	A. Financial situation						B. Labor productivity growth			
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.492***	-0.0018**	-0.0136***	-0.0675***	0.0089	0.0740***	0.669***	-0.0425***	-0.1182***	0.1607***
	(0.083)	(0.0007)	(0.0042)	(0.0139)	(0.0236)	(0.0172)	(0.083)	(0.0063)	(0.0143)	(0.0192)
With 50-249 employees	0.177**	-0.0006*	-0.0048*	-0.0241**	0.0025	0.0270**	0.171**	-0.0105**	-0.0306**	0.0411**
	(0.081)	(0.0004)	(0.0025)	(0.0114)	(0.0086)	(0.0132)	(0.082)	(0.0050)	(0.0147)	(0.0196)
With at least 250 employees	0.064	-0.0002	-0.0018	-0.0089	0.0016	0.0094	-0.016	0.0010	0.0027	-0.0038
	(0.098)	(0.0004)	(0.0028)	(0.0136)	(0.0038)	(0.0146)	(0.098)	(0.0065)	(0.0172)	(0.0237)
Private sector	0.444***	-0.0016**	-0.0123***	-0.0609***	0.0080	0.0667***	0.234*	-0.0149*	-0.0414*	0.0563*
	(0.121)	(0.0007)	(0.0046)	(0.0180)	(0.0214)	(0.0211)	(0.122)	(0.0078)	(0.0215)	(0.0292)
Single establishment	0.229***	-0.0008**	-0.0063**	-0.0314***	0.0041	0.0344***	-0.248***	0.0157***	0.0438***	-0.0595***
	(0.078)	(0.0004)	(0.0027)	(0.0114)	(0.0110)	(0.0130)	(0.080)	(0.0052)	(0.0140)	(0.0190)
Company level bargaining	-0.046	0.0002	0.0013	0.0063	-0.0008	-0.0069	0.057	-0.0036	-0.0102	0.0138
	(0.115)	(0.0004)	(0.0032)	(0.0158)	(0.0032)	(0.0172)	(0.115)	(0.0072)	(0.0205)	(0.0277)
Higher than company level	-0.060	0.0002	0.0017	0.0082	-0.0012	-0.0090	0.036	-0.0023	-0.0064	0.0088
	(0.096)	(0.0004)	(0.0027)	(0.0132)	(0.0034)	(0.0144)	(0.095)	(0.0061)	(0.0169)	(0.0229)
Mixed level	0.069	-0.0002	-0.0018	-0.0092	0.0005	0.0107	-0.043	0.0028	0.0075	-0.0103
	(0.107)	(0.0004)	(0.0028)	(0.0143)	(0.0034)	(0.0167)	(0.108)	(0.0071)	(0.0189)	(0.0260)
Workers with an OEC	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0000	-0.0001	0.0002
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0002)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Female workers	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.002	-0.0001	-0.0003	0.0004
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Workers with a university degree	0.002	-0.0000	-0.0000	-0.0002	0.0000	0.0002	0.004**	-0.0002**	-0.0006**	0.0008**
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Part-time workers	0.002	-0.0000	-0.0001	-0.0003	0.0000	0.0003	0.000	-0.0000	-0.0000	0.0000
	(0.002)	(0.0000)	(0.0001)	(0.0003)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0004)	(0.0005)
N		3,420					3,482			

Notes: The multilevel mixed-effects ordered logistic model is given in equation (1) in the text, and is estimated using the *meologit* command in Stata 15. Reference categories for establishment size and collective agreement dummies are given by the 10 to 49 employees and no collective agreement groups, respectively. The table reports both the estimated coefficients and mean marginal effects. The included variables are described in the text and in Appendix Table 3. The log-likelihood ratio statistics, not reported in the table, are equal to 157.08 (p-value: 0.000) in column A; and 6.07 (p-value: 0.007) in column B; in all cases the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses.

Source: 2013 ECS, Management Questionnaire.

Table 2: Establishment Performance, Management Practices (MP), and Works Council Presence in the Germanic Cluster

Variable	Outcome (Establishment performance)									
	A. Financial situation						B. Labor productivity growth			
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.573***	-0.0020**	-0.0157***	-0.0784***	0.0098	0.0863***	0.680***	-0.0429***	-0.1200***	0.1629***
	(0.106)	(0.0008)	(0.0049)	(0.0172)	(0.0270)	(0.0210)	(0.108)	(0.0074)	(0.0186)	(0.0252)
Works council	-0.093	0.0003	0.0026	0.0127	-0.0016	-0.0140	-0.246***	0.0155***	0.0434***	-0.0589***
	(0.089)	(0.0003)	(0.0025)	(0.0123)	(0.0046)	(0.0137)	(0.089)	(0.0057)	(0.0157)	(0.0213)
Single index*Works council	-0.169	0.0006	0.0046	0.0231	-0.0029	-0.0254	0.036	-0.0022	-0.0063	0.0085
	(0.159)	(0.0006)	(0.0045)	(0.0220)	(0.0084)	(0.0243)	(0.160)	(0.0101)	(0.0283)	(0.0384)
With 50-249 employees	0.208**	-0.0015**	-0.0118***	-0.0585***	0.0074	0.0645***	0.250***	-0.0120	-0.0336	0.0456
	(0.086)	(0.0007)	(0.0045)	(0.0180)	(0.0203)	(0.0209)	(0.087)	(0.0078)	(0.0217)	(0.0294)
With at least 250 employees	0.127	-0.0007*	-0.0056**	-0.0283**	0.0031	0.0316**	0.106	-0.0153***	-0.0446***	0.0599***
	(0.108)	(0.0004)	(0.0027)	(0.0121)	(0.0099)	(0.0141)	(0.108)	(0.0053)	(0.0156)	(0.0208)
Private sector	0.428***	-0.0005	-0.0036	-0.0177	0.0028	0.0189	0.190	-0.0069	-0.0187	0.0257
	(0.122)	(0.0004)	(0.0031)	(0.0149)	(0.0063)	(0.0165)	(0.123)	(0.0069)	(0.0192)	(0.0261)
Single establishment	0.210***	-0.0007*	-0.0058**	-0.0287**	0.0036	0.0316**	-0.279***	0.0176***	0.0492***	-0.0667***
	(0.079)	(0.0004)	(0.0026)	(0.0113)	(0.0100)	(0.0129)	(0.081)	(0.0052)	(0.0141)	(0.0191)
Company level bargaining	-0.031	0.0001	0.0009	0.0043	-0.0006	-0.0047	0.076	-0.0048	-0.0133	0.0181
	(0.115)	(0.0004)	(0.0032)	(0.0158)	(0.0026)	(0.0173)	(0.116)	(0.0073)	(0.0204)	(0.0277)
Higher than company level	-0.050	0.0002	0.0014	0.0069	-0.0010	-0.0075	0.069	-0.0044	-0.0122	0.0166
	(0.096)	(0.0003)	(0.0027)	(0.0132)	(0.0029)	(0.0145)	(0.097)	(0.0062)	(0.0170)	(0.0231)
Mixed level	0.082	-0.0003	-0.0021	-0.0109	0.0006	0.0128	-0.000	0.0000	0.0001	-0.0001
	(0.108)	(0.0004)	(0.0029)	(0.0144)	(0.0040)	(0.0169)	(0.109)	(0.0071)	(0.0191)	(0.0262)
Workers with an OEC	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0000	-0.0001	0.0002
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0002)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Female workers	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0001	-0.0002	0.0003
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Workers with a university degree	0.001	-0.0000	-0.0000	-0.0002	0.0000	0.0002	0.004**	-0.0002**	-0.0006**	0.0009**
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Part-time workers	0.002	-0.0000	-0.0001	-0.0003	0.0000	0.0003	0.000	-0.0000	-0.0001	0.0001
	(0.002)	(0.0000)	(0.0001)	(0.0003)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0004)	(0.0005)
N		3,420					3,482			

Note: See notes to Table 1. The multilevel mixed-effects ordered logistic model is given in equation (2) in the text. The log-likelihood ratio statistics, not reported in the table, are equal to 151.06 (p-value: 0.000) in column A; and 2.72 (p-value: 0.049) in column B; in all cases the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses.

Source: 2013 ECS, Management Questionnaire.

Table 3: Establishment Performance, Management Practices (MP), and Works Council Type (‘Constructive [or otherwise]’ as Perceived by Management)

Variable	Outcome (Establishment performance)									
	A. Financial situation						B. Labor productivity growth			
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index	0.493***	-0.0016**	-0.0137***	-0.0678***	0.0089	0.0742***	0.698***	-0.0440***	-0.1230***	0.1670***
	(0.084)	(0.0007)	(0.0042)	(0.0139)	(0.0232)	(0.0172)	(0.084)	(0.0061)	(0.0143)	(0.0193)
Works council is constructive	-0.069	0.0002	0.0019	0.0095	-0.0013	-0.0104	-0.224**	0.0141**	0.0394**	-0.0535**
	(0.092)	(0.0003)	(0.0026)	(0.0127)	(0.0036)	(0.0139)	(0.092)	(0.0059)	(0.0163)	(0.0220)
Works council is not constructive	-0.314**	0.0010*	0.0087**	0.0431**	-0.0057	-0.0472**	-0.275**	0.0174**	0.0485**	-0.0659**
	(0.137)	(0.0006)	(0.0044)	(0.0194)	(0.0149)	(0.0219)	(0.138)	(0.0088)	(0.0242)	(0.0329)
With 50-249 employees	0.227***	-0.0007*	-0.0062**	-0.0310**	0.0033	0.0346**	0.249***	-0.0152***	-0.0444***	0.0596***
	(0.086)	(0.0004)	(0.0028)	(0.0122)	(0.0108)	(0.0143)	(0.087)	(0.0053)	(0.0157)	(0.0209)
With at least 250 employees	0.124	-0.0004	-0.0036	-0.0174	0.0030	0.0183	0.092	-0.0060	-0.0161	0.0221
	(0.108)	(0.0004)	(0.0031)	(0.0150)	(0.0062)	(0.0164)	(0.109)	(0.0070)	(0.0192)	(0.0262)
Private sector	0.416***	-0.0014**	-0.0116***	-0.0571***	0.0075	0.0626***	0.193	-0.0122	-0.0341	0.0462
	(0.122)	(0.0007)	(0.0045)	(0.0180)	(0.0196)	(0.0208)	(0.123)	(0.0078)	(0.0217)	(0.0295)
Single establishment	0.222***	-0.0007*	-0.0062**	-0.0305***	0.0040	0.0334**	-0.280***	0.0177***	0.0493***	-0.0670***
	(0.079)	(0.0004)	(0.0027)	(0.0114)	(0.0105)	(0.0130)	(0.081)	(0.0053)	(0.0141)	(0.0192)
Company level bargaining	-0.041	0.0001	0.0012	0.0057	-0.0008	-0.0062	0.084	-0.0053	-0.0148	0.0200
	(0.116)	(0.0004)	(0.0032)	(0.0159)	(0.0030)	(0.0173)	(0.116)	(0.0073)	(0.0205)	(0.0278)
Higher than company level	-0.054	0.0002	0.0015	0.0074	-0.0011	-0.0080	0.072	-0.0045	-0.0126	0.0172
	(0.096)	(0.0003)	(0.0027)	(0.0133)	(0.0031)	(0.0145)	(0.097)	(0.0062)	(0.0171)	(0.0233)
Mixed level	0.073	-0.0002	-0.0019	-0.0097	0.0006	0.0113	-0.009	0.0006	0.0015	-0.0020
	(0.108)	(0.0004)	(0.0029)	(0.0146)	(0.0036)	(0.0169)	(0.110)	(0.0072)	(0.0191)	(0.0263)
Workers with an OEC	-0.000	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0000	-0.0001	0.0002
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0002)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Female workers	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0002	0.001	-0.0001	-0.0002	0.0003
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Workers with a university degree	0.001	-0.0000	-0.0000	-0.0002	0.0000	0.0002	0.004**	-0.0002**	-0.0006**	0.0009**
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Part-time workers	0.002	-0.0000	-0.0001	-0.0003	0.0000	0.0003	0.001	-0.0000	-0.0001	0.0001
	(0.002)	(0.0000)	(0.0001)	(0.0003)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0004)	(0.0005)
N		3,399					3,456			

Notes: See notes to Table 1. The multilevel mixed-effects ordered logistic model is given in equation (3) in the text. The works council type is based on the variable er15a and is described in Appendix Table 3. Establishments without a works council are the reference group. The interaction terms between management practices and works council type were never statistically significant and have been dropped from the specification. The log-likelihood ratio statistics, not reported in the table, are equal to 151.06 (p-value: 0.000) in column A; and 2.72 (p-value: 0.049) in column B; in all cases the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses.

Source: 2013 ECS, Management Questionnaire.

Table 4: Establishment Performance, Management Practices (MP), and Works Council Type (‘Constructive and/or non-delaying’ as Perceived by Management)

Variable	Outcome (Establishment performance)									
	A. Financial situation						B. Labor productivity growth			
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.497***	-0.0017**	-0.0136***	-0.0683***	0.0088	0.0748***	0.689***	-0.0433***	-0.1216***	0.1650***
	(0.084)	(0.0007)	(0.0041)	(0.0140)	(0.0233)	(0.0172)	(0.084)	(0.0061)	(0.0143)	(0.0193)
With a works council that is constructive and/or does not delay decision making	0.421**	-0.0014*	-0.0116**	-0.0579**	0.0075	0.0634**	0.151	-0.0095	-0.0266	0.0360
	(0.181)	(0.0008)	(0.0058)	(0.0258)	(0.0200)	(0.0290)	(0.182)	(0.0115)	(0.0321)	(0.0435)
Without a works council	0.499***	-0.0017*	-0.0137**	-0.0686**	0.0089	0.0751**	0.375*	-0.0236*	-0.0662*	0.0898*
	(0.190)	(0.0009)	(0.0063)	(0.0273)	(0.0236)	(0.0309)	(0.192)	(0.0122)	(0.0338)	(0.0458)
With 50-249 employees	0.221**	-0.0007*	-0.0060**	-0.0302**	0.0033	0.0336**	0.000	-0.0154***	-0.0450***	0.0604***
	(0.086)	(0.0004)	(0.0027)	(0.0122)	(0.0105)	(0.0142)	(0.000)	(0.0053)	(0.0157)	(0.0208)
With at least 250 employees	0.132	-0.0004	-0.0037	-0.0184	0.0030	0.0195	0.252***	-0.0069	-0.0187	0.0256
	(0.108)	(0.0004)	(0.0031)	(0.0150)	(0.0065)	(0.0165)	(0.087)	(0.0069)	(0.0193)	(0.0262)
Private sector	0.425***	-0.0014**	-0.0117***	-0.0584***	0.0075	0.0639***	0.106	-0.0125	-0.0351	0.0476
	(0.122)	(0.0007)	(0.0045)	(0.0180)	(0.0200)	(0.0209)	(0.109)	(0.0078)	(0.0217)	(0.0294)
Single establishment	0.219***	-0.0007*	-0.0060**	-0.0301***	0.0039	0.0330**	0.199	0.0171***	0.0481***	-0.0652***
	(0.079)	(0.0004)	(0.0027)	(0.0114)	(0.0104)	(0.0130)	(0.123)	(0.0052)	(0.0141)	(0.0192)
Company level bargaining	-0.030	0.0001	0.0008	0.0042	-0.0006	-0.0045	-0.272***	-0.0055	-0.0153	0.0208
	(0.115)	(0.0004)	(0.0032)	(0.0159)	(0.0027)	(0.0173)	(0.081)	(0.0073)	(0.0205)	(0.0278)
Higher than company level	-0.045	0.0001	0.0012	0.0062	-0.0009	-0.0066	0.087	-0.0048	-0.0135	0.0183
	(0.096)	(0.0003)	(0.0027)	(0.0133)	(0.0028)	(0.0145)	(0.116)	(0.0062)	(0.0171)	(0.0233)
Mixed level	0.080	-0.0003	-0.0021	-0.0108	0.0007	0.0125	0.076	0.0001	0.0002	-0.0003
	(0.108)	(0.0004)	(0.0029)	(0.0145)	(0.0039)	(0.0169)	(0.097)	(0.0072)	(0.0191)	(0.0263)
Workers with an OEC	-0.000	0.0000	0.0000	0.0001	-0.0000	-0.0001	-0.001	-0.0001	-0.0002	0.0002
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0002)	(0.109)	(0.0001)	(0.0003)	(0.0004)
Female workers	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0001	-0.0002	0.0003
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Workers with a university degree	0.001	-0.0000	-0.0000	-0.0002	0.0000	0.0002	0.001	-0.0002**	-0.0006**	0.0009**
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Part-time workers	0.002	-0.0000	-0.0001	-0.0003	0.0000	0.0003	0.004**	-0.0000	-0.0001	0.0001
	(0.002)	(0.0000)	(0.0001)	(0.0003)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0004)	(0.0005)
N		3,408					3,467			

Notes: See notes to Table 1. As described in the text, the works council type is based on the variables er15a and er15b. The reference group is made up of all establishments with a works council that is both non-constructive and implies delays in decisions. The multilevel mixed-effects ordered logistic model is similar to equation (3) in the text. The log-likelihood ratio statistics, not reported

in the table, are equal to 148.93 (p-value: 0.000) in column A; and 2.20 (p-value: 0.068) in column B; in all cases the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses.
Source: 2013 ECS, Management Questionnaire.

Table 5: Establishment Performance, Management Practices (MP), and Trust ('Management can be trusted [or otherwise]' as Perceived by the Employee Representative)

Variable	Outcome (Establishment performance)									
	A. Financial situation						B. Labor productivity growth			
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
1		2	3	4	5	1		2	3	
Overall index of MP	0.522*	-0.0048	-0.0213*	-0.0678*	0.0094	0.0845*	0.797***	-0.0656***	-0.1175***	0.1831***
	(0.266)	(0.0036)	(0.0125)	(0.0346)	(0.0224)	(0.0444)	(0.272)	(0.0235)	(0.0394)	(0.0604)
Management can be trusted	0.744**	-0.0068	-0.0304*	-0.0966**	0.0134	0.1203**	-0.521	0.0429	0.0768	-0.1197
	(0.321)	(0.0047)	(0.0158)	(0.0415)	(0.0316)	(0.0543)	(0.332)	(0.0279)	(0.0486)	(0.0756)
With 50-249 employees	0.651**	-0.0071	-0.0309*	-0.0881**	0.0310	0.0951**	0.417	-0.0397	-0.0572	0.0968
	(0.270)	(0.0052)	(0.0169)	(0.0374)	(0.0330)	(0.0388)	(0.268)	(0.0275)	(0.0354)	(0.0619)
With at least 250 employees	0.644**	-0.0071	-0.0306*	-0.0873**	0.0310	0.0939**	0.734**	-0.0625**	-0.1077**	0.1701**
	(0.309)	(0.0053)	(0.0178)	(0.0421)	(0.0328)	(0.0459)	(0.307)	(0.0284)	(0.0444)	(0.0702)
Private sector	0.509*	-0.0046	-0.0208	-0.0661*	0.0092	0.0823*	0.355	-0.0292	-0.0523	0.0815
	(0.282)	(0.0036)	(0.0131)	(0.0364)	(0.0219)	(0.0468)	(0.290)	(0.0241)	(0.0425)	(0.0661)
Single establishment	0.499**	-0.0045	-0.0204*	-0.0648**	0.0090	0.0808**	0.210	-0.0173	-0.0309	0.0481
	(0.208)	(0.0031)	(0.0105)	(0.0274)	(0.0214)	(0.0350)	(0.211)	(0.0175)	(0.0310)	(0.0483)
Company level bargaining	-0.200	0.0022	0.0094	0.0271	-0.0092	-0.0295	0.251	-0.0235	-0.0344	0.0579
	(0.355)	(0.0040)	(0.0168)	(0.0478)	(0.0183)	(0.0527)	(0.373)	(0.0354)	(0.0509)	(0.0860)
Higher than company level	0.171	-0.0015	-0.0069	-0.0222	0.0029	0.0277	0.402	-0.0357	-0.0569	0.0925
	(0.314)	(0.0031)	(0.0133)	(0.0415)	(0.0107)	(0.0500)	(0.314)	(0.0305)	(0.0422)	(0.0720)
Mixed level	0.121	-0.0011	-0.0050	-0.0158	0.0025	0.0194	0.344	-0.0312	-0.0481	0.0792
	(0.353)	(0.0033)	(0.0147)	(0.0463)	(0.0098)	(0.0564)	(0.369)	(0.0344)	(0.0509)	(0.0846)
Workers with an OEC	-0.001	0.0000	0.0000	0.0002	-0.0000	-0.0002	0.015***	-0.0013***	-0.0022***	0.0035***
	(0.005)	(0.0000)	(0.0002)	(0.0006)	(0.0001)	(0.0008)	(0.005)	(0.0004)	(0.0007)	(0.0010)
Female workers	0.005	-0.0000	-0.0002	-0.0006	0.0001	0.0008	0.006	-0.0005	-0.0009	0.0014
	(0.006)	(0.0001)	(0.0002)	(0.0008)	(0.0002)	(0.0010)	(0.006)	(0.0005)	(0.0009)	(0.0013)
Workers with a university degree	-0.010*	0.0001	0.0004*	0.0013*	-0.0002	-0.0016*	-0.004	0.0004	0.0006	-0.0010
	(0.005)	(0.0001)	(0.0002)	(0.0007)	(0.0004)	(0.0008)	(0.005)	(0.0004)	(0.0007)	(0.0012)
Part-time workers	-0.000	0.0000	0.0000	0.0000	-0.0000	-0.0000	0.003	-0.0003	-0.0005	0.0008
	(0.007)	(0.0001)	(0.0003)	(0.0009)	(0.0001)	(0.0011)	(0.006)	(0.0005)	(0.0009)	(0.0015)
N		396					398			

Notes: The multilevel mixed-effects ordered logistic model is given in equation (4) in the text. The estimation sample in this case is restricted to establishments with a works council and has a basis in the matched MM-ER dataset. The variable *Management can be trusted* is based on the variable q42a_c described in Appendix Table 3. In column A, the log-likelihood ratio statistic is equal to 14.51 (p-value: 0.000). In column B, the null of an ordinary ordered logistic model is not rejected against the multilevel mixed-effects ordered logistic model. In this case the results are obtained from an ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses. Source: 2013 ECS, Management and Employee Representative Questionnaires.

Table 6: Establishment Performance, Management Practices (MP), and Management-Employee Dissonance

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					Coefficient	B. Labor productivity growth		
		Marginal effects (outcome-category in ascending order)						Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.563**	-0.0012	-0.0206	-0.0674*	-0.0038	0.0930*	0.711**	-0.0558**	-0.1085**	0.1643**
	(0.283)	(0.0014)	(0.0126)	(0.0345)	(0.0283)	(0.0487)	(0.286)	(0.0236)	(0.0429)	(0.0644)
Dissonance_1	-0.564**	0.0012	0.0207*	0.0675**	0.0038	-0.0932**	0.191	-0.0150	-0.0291	0.0440
	(0.252)	(0.0014)	(0.0117)	(0.0311)	(0.0283)	(0.0437)	(0.254)	(0.0201)	(0.0386)	(0.0585)
Dissonance_2	-0.968***	0.0021	0.0355**	0.1158***	0.0065	-0.1599***	-0.312	0.0245	0.0475	-0.0720
	(0.347)	(0.0023)	(0.0175)	(0.0435)	(0.0485)	(0.0619)	(0.361)	(0.0286)	(0.0548)	(0.0831)
With 50-249 employees	0.764***	-0.0021	-0.0343*	-0.1007**	0.0268	0.1102***	0.458*	-0.0421	-0.0662*	0.1083*
	(0.279)	(0.0023)	(0.0185)	(0.0395)	(0.0424)	(0.0415)	(0.272)	(0.0272)	(0.0378)	(0.0637)
With at least 250 employees	0.929***	-0.0023	-0.0391**	-0.1193***	0.0205	0.1403***	0.866***	-0.0688**	-0.1344***	0.2032***
	(0.324)	(0.0026)	(0.0199)	(0.0439)	(0.0499)	(0.0529)	(0.320)	(0.0280)	(0.0495)	(0.0738)
Private sector	0.278	-0.0006	-0.0102	-0.0333	-0.0019	0.0459	0.179	-0.0140	-0.0272	0.0413
	(0.293)	(0.0009)	(0.0113)	(0.0352)	(0.0141)	(0.0490)	(0.298)	(0.0235)	(0.0454)	(0.0687)
Single establishment	0.383*	-0.0008	-0.0140	-0.0458*	-0.0026	0.0632*	0.207	-0.0163	-0.0316	0.0478
	(0.221)	(0.0010)	(0.0095)	(0.0271)	(0.0191)	(0.0372)	(0.218)	(0.0173)	(0.0332)	(0.0503)
Company level bargaining	-0.141	0.0004	0.0059	0.0178	-0.0023	-0.0217	0.258	-0.0214	-0.0384	0.0599
	(0.373)	(0.0010)	(0.0155)	(0.0469)	(0.0097)	(0.0577)	(0.389)	(0.0328)	(0.0579)	(0.0904)
Higher than company level	0.154	-0.0003	-0.0056	-0.0184	-0.0010	0.0254	0.259	-0.0216	-0.0387	0.0603
	(0.335)	(0.0008)	(0.0128)	(0.0409)	(0.0079)	(0.0544)	(0.326)	(0.0287)	(0.0474)	(0.0758)
Mixed level	0.116	-0.0003	-0.0043	-0.0140	-0.0004	0.0189	0.198	-0.0169	-0.0292	0.0461
	(0.372)	(0.0009)	(0.0140)	(0.0451)	(0.0065)	(0.0606)	(0.379)	(0.0328)	(0.0555)	(0.0880)
Workers with an OEC	0.001	-0.0000	-0.0000	-0.0001	-0.0000	0.0001	0.012**	-0.0010**	-0.0019**	0.0028**
	(0.005)	(0.0000)	(0.0002)	(0.0006)	(0.0000)	(0.0009)	(0.005)	(0.0004)	(0.0008)	(0.0011)
Female workers	0.001	-0.0000	-0.0000	-0.0002	-0.0000	0.0002	0.005	-0.0004	-0.0008	0.0012
	(0.006)	(0.0000)	(0.0002)	(0.0007)	(0.0001)	(0.0010)	(0.006)	(0.0005)	(0.0009)	(0.0014)
Workers with a university degree	-0.013**	0.0000	0.0005*	0.0016**	0.0001	-0.0021**	-0.004	0.0003	0.0006	-0.0009
	(0.005)	(0.0000)	(0.0003)	(0.0007)	(0.0007)	(0.0009)	(0.005)	(0.0004)	(0.0008)	(0.0012)
Part-time workers	0.006	-0.0000	-0.0002	-0.0007	-0.0000	0.0010	0.003	-0.0003	-0.0005	0.0008
	(0.007)	(0.0000)	(0.0003)	(0.0008)	(0.0003)	(0.0012)	(0.007)	(0.0005)	(0.0010)	(0.0015)
N		369						371		

Notes: See notes to Table 5. The multilevel mixed-effects ordered logistic model is given in equation (5) in the text. Dissonance_1 and Dissonance_2 are based on raw variables KCLIMATE and q44. They are described in Appendix Table 3. In column A, the log-likelihood ratio statistic is equal to 21.73 (p-value: 0.000). In column B, the null of an ordinary ordered logistic model is not rejected against the multilevel mixed-effects ordered logistic model. In this case the results are obtained from an ordered logistic model. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses.

Appendix Table 1: Selected Management Practices and Domains

Domains	Items
1-Work organization practices and monitoring (3 items)	Use of information systems; monitoring of quality of production processes or service delivery; monitoring of external ideas or technological developments.
2-Team working (1 item)	Use of groups of people working together with a shared responsibility and varying degree of autonomy.
3-Performance appraisal (1 item)	Proportion of performance appraisal or evaluation interview.
4-Incentive /performance-based pay (5 items)	Use of payment by results; extra pay linked to the individual performance; extra pay linked to the performance of the team; extra pay linked to the results of the company (profit sharing); extra pay linked to ownership schemes.
5-Employee involvement (7 items)	Use of practices designed to involve employees in how work is organized: regular meetings, regular staff meetings; meetings of a temporary group/committee/ad-hoc group; dissemination of information through newsletters, website, notice boards, email; discussions with employees through social media or in online discussion; suggestion schemes, and employee surveys among employees.

Notes: A full description of each practice is given in Appendix Table 2A. Two extra domains, namely 6-Skill development/training and 7-Provision of information to employees and participation in decision making, were not included in our set of selected management practices. In the former case, the exclusion is due to the fact that the Management Questionnaire only provides information on the proportion of employees who receive on- and off-the-job training, not on the qualitative nature of the practice. In the latter case, the information is based on the set of establishments with a major organizational change, an extra restriction that implies a (further) reduction of approximately one-third in the size of our ER-MM matched sample.

Appendix Table 2A: Description of the Selected Management Practices

Domain	Practice	Survey variable in the raw dataset	Description
1-Work organization practices and monitoring (3 items)	Use of information systems	EINFSYS	0-1 ordinal variable in ascending order: 0 if establishment does not use information systems to minimize supplies or work-in-process; 1 otherwise. (These practices are sometimes known as just-in-time or lean production systems or as working according to a zero-buffer principle.)
	Monitoring of production processes	EMONQUA	0-2 ordinal variable in ascending order: 0 if establishment does not monitor the quality of its production processes or service delivery; 1 if it does so intermittently; 2 if it does so on a continuous basis.
	Monitoring of external ideas	EEXTEMON	0-2 ordinal variable in ascending order: 0 if establishment does not monitor external ideas or technological developments for new or changed products, processes or services; 1 if it is a part of the responsibilities of general staff; 2 if it does so using staff assigned specifically to the task.
2-Team work (1 item)	Team work	FTEAMEX and FTAUTON	0-2 ordinal variable in ascending order: 0 if no team is present; 1 if tasks to be performed by the team are distributed by a superior; 2 if there is a team and team members decide among themselves. Note that a team is a group of people working together with a shared responsibility for the execution of allocated tasks, within or across units of the establishment.
3-Performance appraisal (1 item)	Performance appraisal	HAPRAIPC	0-6 ordinal variable in ascending order: 0 if the percentage of employees who have a performance appraisal or evaluation interview at least once a year is 0%; 1 if less than 20%; 2 if 20 to 39%; 3 if 40 to 59%; 4 if 60 to 79%; 5 if 80 to 99%; 6 if 100%.
4-Incentives/performance-based pay (5 items)	Payment by results	HVBPRES	0-1 ordinal variable in ascending order: 1 if payment by results (for example, piece rates, provisions, brokerages or commissions); 0 otherwise.
	Extra pay linked to individual performance	HVPINPER	0-1 ordinal variable in ascending order: 1 if variable extra pay linked to the individual performance following management appraisal; 0 otherwise.
	Extra pay linked to team performance	HVPGRPE	0-1 ordinal variable in ascending order: 1 if extra pay linked to the performance of the team, working group or department; 0 otherwise.
	Profit sharing	HVPPRSH	0-1 ordinal variable in ascending order: 1 if variable extra pay linked to the results of the company or establishment (profit sharing scheme); 0 otherwise.
	Ownership scheme	HVPSHOW	0-1 ordinal variable in ascending order: 1 if variable extra pay in form of share ownership scheme offered by the company; 0 otherwise.
5-Employee involvement (7 items)	Regular meetings	E1_A	0-1 ordinal variable in ascending order: 1 if regular meetings between employees and immediate manager; 0 otherwise.
	Regular staff meetings	E1_B	0-1 ordinal variable in ascending order: 1 if regular staff meetings open to all employees at the establishment; 0 otherwise.
	Ad hoc groups	E1_C	0-1 ordinal variable in ascending order: 1 if meetings of a temporary group or committee or ad-hoc group; 0 otherwise.
	Newsletters, website and email	E1_D	0-1 ordinal variable in ascending order: 1 if dissemination of information through newsletters, website, notice boards, email, etc.; 0 otherwise.
	Social media	E1_E	0-1 ordinal variable in ascending order: 1 if discussions with employees through social media or in online discussion boards; 0 otherwise.
	Suggestion schemes	E1_F	0-1 ordinal variable in ascending order: 1 if suggestion schemes (the collection of ideas and suggestions from the employees, voluntary and at any time, traditionally by means of a 'suggestion box'); 0 otherwise.
	Employee surveys	E1_G	0-1 ordinal variable in ascending order: 1 if employee surveys among employees; 0 otherwise.

Appendix Table 2B: Distribution of Management Practices (MP) by Works Council Type ('Constructive [or otherwise]' as Perceived by Management), in Percent

	Establishments without a works council			Establishments with a works council					
				Works council is constructive			Works council is not constructive		
Panel A: Domains 1, 2, 4, and 5									
1-Work organization practices and monitoring (3 items)									
	0	1	2	0	1	2	0	1	2
Use of information systems (0-1 ordinal variable)	57	43		31	69		40	60	
Monitoring of production processes (0-2 ordinal variable)	4	15	81	2	13	85	4	11	85
Monitoring of external ideas (0-2 ordinal variable)	32	33	35	17	33	50	27	31	42
2-Team work (1 item; 0-2 ordinal variable)	22	50	28	13	60	27	15	63	22
4-Incentive/performance-based pay (5 items; 0-2 ordinal variable)									
Payment by results	62	38		51	49		59	41	
Extra pay linked to individual performance	54	46		37	63		39	61	
Extra pay linked to team performance	78	22		63	37		70	30	
Profit sharing	66	34		50	50		52	48	
Ownership scheme	96	4		87	13		92	8	
5-Employee involvement (7 items; 0-2 ordinal variable)									
Regular meetings	11	89		8	92		11	89	
Regular staff meetings	46	54		30	70		43	57	
Ad hoc groups	53	47		29	71		32	68	
Newsletters, website and email	30	70		9	91		7	93	
Social media	88	12		78	22		87	13	
Suggestion schemes	52	48		36	64		41	59	
Employee surveys	53	47		37	63		48	52	
Panel B: Domain 3									
3-Performance appraisal (single item; 0-6 ordinal variable)									
	0	1	2	3	4	5	6		
Establishments without a works council	17	6	9	9	4	6	50		
Establishments with a constructive works council establishments	5	7	8	10	6	9	55		
Establishments with a non-constructive works council	8	9	9	7	5	13	50		

Notes: The works council type is based on the variable er15a, described in Appendix Table 3. Using the alternative variable, er15b, produces a largely similar distribution. In that case, the management respondent is asked whether the involvement of the employee representation leads to considerable delays in important management decisions. Both variables used to define works council type are described in Appendix Table 3.

Appendix Table 3: Definition of the Overall Management Practice (MP) Indexes, Establishment Performance, and the Control Variables

Variables	Survey variable in the raw dataset	Definition
<i>Overall management practice:</i>		
Overall management practice index (domains 1 through 5)		Given by the unweighted average over the z-scores on individual domains 1 through 5.
Overall management practice index (based on raw scores of domains 1 through 5)		Given by the sum over all raw scores in domains 1 through 5. The variable is contained in the 0-25 closed interval.
<i>Performance:</i>		
Financial situation	KFINAN	Ordered variable on a 1 to 5 scale: 1 is the lowest level.
Labor productivity growth	KLABPRCH	Ordered variable on a 1 to 3 scale: 1 is the lowest level. The establishment's current labor productivity is compared to that obtaining three years earlier.
<i>Workplace representation:</i>		
Works council		1/0 dummy: 1 if there is a works council at the workplace.
<i>Type of works council: (based on question ER15A)</i>		
Works council is constructive (management view)	er15a	1/0 dummy: 1 if management strongly agrees/agrees that the works council is constructive in finding ways to improve workplace performance.
<i>Type of works council: (alternative based on question ER15B)</i>		
Works council delays management decisions (management view)	er15b	1/0 dummy: 1 if management strongly agrees/agrees that the involvement of the works council often leads to considerable delays in important management decisions.
<i>Employee (representative) trust:</i>		
Management can be trusted	q42a_c	1/0 dummy: 1 if the employee representative strongly agrees/agrees that management can be trusted.
<i>Collective agreement:</i>		
No collective agreement	Er12	1/0 dummy: Individual agreement (i.e. no collective agreement).
Company level		1/0 dummy: Company-level agreement.
Higher than company level		1/0 dummy: Higher than company-level agreement.
Mixed level		1/0 dummy: Mixed-level agreement (i.e. company-level and higher than company-level).
<i>Workforce composition:</i>		
Workers with an OEC	q33perm	Percentage of employees who have an open-ended contract (OEC).
Female workers	q33wom	Percentage of employees who are female.
Workers with a university degree	q33univ	Percentage of employees who have a university degree.
Part-time workers	q33pt	Percentage of employees who work part-time (i.e. fewer hours than the usual full-time arrangement).

Single establishment	ASINGLE	1/0 dummy: 1 if single independent company or organization.
Private sector	APRIVATE	1/0 dummy: 1 if establishment belongs to the private sector.
Management-employee dissonance:		<p>Management-employee dissonance is based on the separate views of management and employee representative. Management states the opinion on the general work climate at the establishment (raw variable KCLIMATE) and whether the employee representation can be trusted (er15e); in turn the employee representative states the opinion on the general work climate (q44), on whether management can be trusted (q42a_c), and whether the relationship between management and the employee representation can be described as hostile (q20_c). Their opinions are respectively coded as 1/0 dummies as follows:</p> <p>KCLIMATE_D: 1 if the general work climate in the establishment is very good or good; er15e_D: 1 if the management agrees or strongly agree that the employee representation can be trusted; q44_D: 1 if the general work climate in the establishment is very good or good; q42a_c_D: 1 if the employee representative agrees or strongly agrees that management can be trusted q20_c_D: 1 if the employee representative agrees or strongly agrees that relationship between management and the employee representation can be described as hostile.</p> <p>The definition of the Dissonance_1 and Dissonance_2 variables (together with the reference category) used in Table 6 are given in the last three rows of this table. Those for the five supplementary alternative dissonance measures implemented in Online Tables 6A through 6E are coded in an identical manner.</p>
Dissonance_1		1/0 dummy: 1 if KCLIMATE_D = 1 and q44_D = 0
Dissonance_2		1/0 dummy: 1 if KCLIMATE_D = 0 and q44_D = 1
(Reference category)		1/0 dummy: 1 if KCLIMATE_D = 1 and q44_D = 1. All cases in which KCLIMATE_D = 0 and q44_D = 0 are discarded.

Note: The dataset also comprises ten distinct sectors and three establishment size groups (10 to 49, 50 to 249, and at least 250 employees).

Appendix Table 4: Establishment Performance, Management Practices Raw Scores (MP), and Works Council Presence in the Germanic Cluster

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					B. Labor productivity growth			
		Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5			1	2
Single index (based on raw scores)	0.048***	-0.0002**	-0.0013***	-0.0065***	0.0008	0.0072***	0.067***	-0.0042***	-0.0119***	0.0161***
	(0.008)	(0.0001)	(0.0004)	(0.0014)	(0.0023)	(0.0017)	(0.008)	(0.0006)	(0.0015)	(0.0019)
Works council	-0.116	0.0004	0.0032	0.0158	-0.0019	-0.0175	-0.243***	0.0153***	0.0431***	-0.0583***
	(0.088)	(0.0003)	(0.0025)	(0.0122)	(0.0058)	(0.0136)	(0.088)	(0.0057)	(0.0156)	(0.0211)
With 50-249 employees	0.214**	-0.0015**	-0.0116***	-0.0577***	0.0069	0.0639***	0.250***	-0.0116	-0.0328	0.0444
	(0.086)	(0.0007)	(0.0045)	(0.0180)	(0.0205)	(0.0210)	(0.087)	(0.0078)	(0.0218)	(0.0295)
With at least 250 employees	0.118	-0.0007*	-0.0058**	-0.0291**	0.0028	0.0327**	0.096	-0.0152***	-0.0448***	0.0600***
	(0.108)	(0.0004)	(0.0027)	(0.0121)	(0.0105)	(0.0143)	(0.108)	(0.0053)	(0.0157)	(0.0208)
Private sector	0.422***	-0.0004	-0.0033	-0.0163	0.0026	0.0174	0.185	-0.0062	-0.0169	0.0231
	(0.122)	(0.0004)	(0.0031)	(0.0149)	(0.0060)	(0.0164)	(0.123)	(0.0069)	(0.0193)	(0.0262)
Single establishment	0.223***	-0.0008*	-0.0061**	-0.0304***	0.0037	0.0337**	-0.265***	0.0167***	0.0470***	-0.0636***
	(0.079)	(0.0004)	(0.0027)	(0.0114)	(0.0108)	(0.0131)	(0.081)	(0.0052)	(0.0142)	(0.0192)
Company level bargaining	-0.024	0.0001	0.0007	0.0034	-0.0005	-0.0037	0.104	-0.0065	-0.0183	0.0249
	(0.115)	(0.0004)	(0.0032)	(0.0158)	(0.0025)	(0.0173)	(0.115)	(0.0072)	(0.0205)	(0.0277)
Higher than company level	-0.036	0.0001	0.0010	0.0050	-0.0007	-0.0054	0.083	-0.0053	-0.0147	0.0199
	(0.096)	(0.0003)	(0.0027)	(0.0132)	(0.0025)	(0.0144)	(0.096)	(0.0062)	(0.0169)	(0.0230)
Mixed level	0.101	-0.0003	-0.0026	-0.0135	0.0007	0.0158	0.022	-0.0015	-0.0039	0.0054
	(0.108)	(0.0004)	(0.0029)	(0.0144)	(0.0050)	(0.0170)	(0.109)	(0.0071)	(0.0191)	(0.0262)
Workers with an OEC	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0000	-0.0001	0.0002
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0002)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Female workers	-0.001	0.0000	0.0000	0.0001	-0.0000	-0.0001	0.001	-0.0001	-0.0002	0.0003
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Workers with a university degree	0.001	-0.0000	-0.0000	-0.0002	0.0000	0.0002	0.003**	-0.0002**	-0.0006**	0.0008**
	(0.002)	(0.0000)	(0.0000)	(0.0002)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0003)	(0.0004)
Part-time workers	0.002	-0.0000	-0.0001	-0.0003	0.0000	0.0003	0.000	-0.0000	-0.0001	0.0001
	(0.002)	(0.0000)	(0.0001)	(0.0003)	(0.0001)	(0.0003)	(0.002)	(0.0001)	(0.0004)	(0.0005)
N		3,420					3,482			

Notes: See notes to Table 2. The selected single index of management practices is based on raw scores. This variable is described in the text and in Appendix Table 3. The log-likelihood ratio statistics, not reported in the table, are equal to 161.54 (p-value: 0.000) in column A; and 4.84 (p-value: 0.013) in column B; in all cases the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses. Source: 2013 ECS, Management Questionnaire.

Online Appendix

Online Table 2B: Distribution of Management Practices by Works Council Type (‘Delaying [or otherwise]’ as Perceived by Management), in Percent

	Establishments without a works council			Establishments with a works council					
				Works council does not delay management decisions			Works council delays management decisions		
Panel A: Domains 1, 2, 4, and 5									
1-Work organization practices and monitoring (1 item)	0	1	2	0	1	2	0	1	2
Use of information systems (0-1 ordinal variable)	57	43		34	66		28	72	
Monitoring of production processes (0-2 ordinal variable)	4	15	81	2	12	86	2	14	84
Monitoring of external ideas (0-2 ordinal variable)	32	33	35	19	33	48	18	32	50
2-Team work (1 item; 0-2 ordinal variable)	22	50	28	14	60	26	12	62	26
4-Incentive/performance-based pay (5 items; 0-2 ordinal variable)									
Payment by results	62	38		54	46		51	49	
Extra pay linked to individual performance	54	46		37	63		39	61	
Extra pay linked to team performance	78	22		64	36		65	35	
Profit sharing	66	34		51	49		49	51	
Ownership scheme	96	4		90	10		85	15	
5-Employee involvement (7 items; 0-2 ordinal variable)									
Regular meetings	11	89		8	92		10	90	
Regular staff meetings	46	54		33	67		31	69	
Ad hoc groups	53	47		30	70		27	73	
Newsletters, website and email	30	70		11	89		30	70	
Social media	88	12		81	19		79	21	
Suggestion schemes	52	48		37	63		37	63	
Employee surveys	53	47		41	59		35	65	
Panel B: Domain 3									
3-Performance appraisal (1 item; 0-2 ordinal variable)									
(single item; 0-6 ordinal variable)	0	1	2	3	4	5	6		
Establishments without a works council	17	6	9	9	4	6	50		
Establishments with works councils that do not delay management decisions	7	7	8	9	5	9	55		
Establishments with works councils that delay management decisions	3	8	9	10	6	12	52		

Note: See notes to Appendix Table 2A.

Online Table 3: Establishment Performance, Management Practices (MP), and Works Council Type (‘Delaying [or otherwise]’ as Perceived by Management)

Variable	Outcome (Establishment performance)									
	A. Financial situation						B. Labor productivity growth			
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
1		2	3	4	5	1		2	3	
Overall index of MP	0.506*** (0.084)	-0.0017** (0.0007)	-0.0139*** (0.0042)	-0.0695*** (0.0140)	0.0088 (0.0236)	0.0762*** (0.0173)	0.686*** (0.084)	-0.0434*** (0.0061)	-0.1209*** (0.0143)	0.1644*** (0.0193)
Works council delays decisions	-0.347*** (0.118)	0.0001 (0.0003)	0.0010 (0.0026)	0.0048 (0.0127)	-0.0006 (0.0023)	-0.0052 (0.0140)	-0.291** (0.120)	0.0143** (0.0059)	0.0398** (0.0163)	-0.0541** (0.0222)
Works council does not delay decisions	-0.035 (0.093)	0.0012** (0.0006)	0.0095** (0.0040)	0.0477*** (0.0171)	-0.0061 (0.0163)	-0.0523*** (0.0197)	-0.226** (0.093)	0.0184** (0.0077)	0.0513** (0.0210)	-0.0697** (0.0285)
With 50-249 employees	0.222** (0.086)	-0.0014** (0.0007)	-0.0116*** (0.0045)	-0.0579*** (0.0181)	0.0074 (0.0198)	0.0636*** (0.0209)	0.249*** (0.087)	-0.0117 (0.0079)	-0.0325 (0.0218)	0.0441 (0.0297)
With at least 250 employees	0.151 (0.108)	-0.0007* (0.0004)	-0.0060** (0.0028)	-0.0303** (0.0122)	0.0034 (0.0105)	0.0337** (0.0142)	0.110 (0.109)	-0.0153*** (0.0053)	-0.0444*** (0.0157)	0.0597*** (0.0209)
Private sector	0.422*** (0.123)	-0.0005 (0.0004)	-0.0042 (0.0031)	-0.0210 (0.0150)	0.0033 (0.0073)	0.0224 (0.0167)	0.184 (0.124)	-0.0072 (0.0070)	-0.0194 (0.0193)	0.0266 (0.0262)
Single establishment	0.213*** (0.079)	-0.0007* (0.0004)	-0.0058** (0.0026)	-0.0292** (0.0114)	0.0037 (0.0100)	0.0321** (0.0129)	-0.286*** (0.081)	0.0181*** (0.0053)	0.0504*** (0.0141)	-0.0685*** (0.0191)
Company level bargaining	-0.030 (0.115)	0.0001 (0.0004)	0.0008 (0.0032)	0.0041 (0.0159)	-0.0005 (0.0026)	-0.0045 (0.0173)	0.094 (0.116)	-0.0060 (0.0073)	-0.0165 (0.0205)	0.0225 (0.0278)
Higher than company level	-0.047 (0.096)	0.0002 (0.0003)	0.0013 (0.0027)	0.0065 (0.0133)	-0.0009 (0.0028)	-0.0070 (0.0145)	0.089 (0.097)	-0.0057 (0.0063)	-0.0157 (0.0170)	0.0213 (0.0232)
Mixed level	0.081 (0.108)	-0.0003 (0.0004)	-0.0021 (0.0029)	-0.0108 (0.0146)	0.0007 (0.0039)	0.0125 (0.0169)	0.009 (0.110)	-0.0006 (0.0072)	-0.0015 (0.0191)	0.0021 (0.0263)
Workers with an OEC	-0.001 (0.002)	0.0000 (0.0000)	0.0000 (0.0000)	0.0001 (0.0002)	-0.0000 (0.0000)	-0.0001 (0.0002)	0.001 (0.002)	-0.0001 (0.0001)	-0.0001 (0.0003)	0.0002 (0.0004)
Female workers	-0.001 (0.002)	0.0000 (0.0000)	0.0000 (0.0000)	0.0001 (0.0002)	-0.0000 (0.0001)	-0.0001 (0.0003)	0.001 (0.002)	-0.0001 (0.0001)	-0.0003 (0.0003)	0.0003 (0.0004)
Workers with a university degree	0.001 (0.002)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0002 (0.0002)	0.0000 (0.0001)	0.0002 (0.0003)	0.003** (0.002)	-0.0002** (0.0001)	-0.0006** (0.0003)	0.0008** (0.0004)
Part-time workers	0.002 (0.002)	-0.0000 (0.0000)	-0.0001 (0.0001)	-0.0003 (0.0003)	0.0000 (0.0001)	0.0003 (0.0003)	0.000 (0.002)	-0.0000 (0.0001)	-0.0000 (0.0004)	0.0001 (0.0005)
N		3,400					3,458			

Notes: See notes to Table 1. The multilevel mixed-effects ordered logistic model is given in equation (3) in the text. The works council type is based on the variable er15b, described in Appendix Table 3. Establishments without a works council are the reference group. The interaction terms are never statistically significant and were dropped from the specification. The log-likelihood ratio statistics, not reported in the table, are equal to 148.12 (p-value: 0.000) in column A; and 1.95 (p-value: 0.080) in column B; in all cases the null of an ordinary ordered logistic model is rejected against the multilevel mixed-effects ordered logistic model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively; standard errors are given in parentheses. Source: 2013 ECS, Management Questionnaire.

Online Table 5A: Establishment Performance, Management Practices (MP), and Management-Works Council Relationship ('Hostile [or otherwise]' as Perceived by the Employee Representative)

Variable	Outcome (Establishment performance)									
	A. Financial situation					B. Labor productivity growth				
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.408	(0.0343)	-0.0177	-0.0537	0.0092	0.0657	0.818***	-0.0660***	-0.1233***	0.1892***
	(0.263)	(0.0030)	(0.0124)	(0.0346)	(0.0182)	(0.0432)	(0.268)	(0.0230)	(0.0396)	(0.0599)
Hostile relationship	-0.518	0.0045	0.0224	0.0681	-0.0117	-0.0834	0.295	-0.0238	-0.0445	0.0683
	(0.406)	(0.0044)	(0.0188)	(0.0531)	(0.0236)	(0.0663)	(0.424)	(0.0343)	(0.0638)	(0.0979)
N	408					410				

Notes: See notes to Table 5. The variable *Hostile relationship* is based on the variable q20_c described in Appendix Table 3.

Online Table 5B: Establishment Performance, Management Practices (MP), and General Work Climate at the Establishment ('Good or Very Good [or otherwise]' as Perceived by the Employee Representative)

Variable	Outcome (Establishment performance)									
	A. Financial situation					B. Labor productivity growth				
	Coefficient	Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index	0.496*	-0.004	-0.021*	-0.063*	0.010	0.079*	0.793***	-0.064***	-0.120***	0.184***
	(0.264)	(0.003)	(0.013)	(0.034)	(0.021)	(0.043)	(0.266)	(0.023)	(0.039)	(0.060)
General Work Climate	0.780***	-0.007	-0.033**	-0.100***	0.015	0.124***	-0.032	0.003	0.005	-0.007
	(0.216)	(0.004)	(0.013)	(0.028)	(0.033)	(0.038)	(0.217)	(0.017)	(0.033)	(0.050)
N	410					412				

Notes: See notes to Table 5. The variable *General work climate* is based on the variable q44 described in Appendix Table 3.

Online Table 6A: Establishment Performance, Management Practices (MP), and Management-Employee Dissonance Using Raw Variables KCLIMATE and q20_c

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					Coefficient	B. Labor productivity growth		
		Marginal effects (outcome-category in ascending order)						Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.408	-0.0017	-0.0172	(0.0180)	0.0058	0.0651	0.816***	-0.0633***	-0.1248***	0.1881***
	(0.265)	(0.0017)	(0.0121)	(0.0337)	(0.0172)	(0.0430)	(0.270)	(0.0223)	(0.0404)	(0.0601)
Dissonance_1	-0.213	0.0009	0.0090	0.0271	-0.0030	-0.0339	0.349	-0.0271	-0.0533	0.0804
	(0.444)	(0.0020)	(0.0189)	(0.0565)	(0.0108)	(0.0709)	(0.466)	(0.0363)	(0.0711)	(0.1071)
Dissonance_2	-1.169 ***	0.0049	0.0492***	0.1487***	-0.0165	-0.1862***	-0.343	0.0266	0.0524	-0.0790
	(0.266)	(0.0038)	(0.0180)	(0.0340)	(0.0480)	(0.0491)	(0.265)	(0.0209)	(0.0403)	(0.0607)
N		403						369		

Online Table 6B: Establishment Performance, Management Practices, and Management-Employee Dissonance Using Raw Variables KCLIMATE and q42a_c

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					Coefficient	B. Labor productivity growth		
		Marginal effects (outcome-category in ascending order)						Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.481*	-0.0011	-0.0198	-0.0597*	0.0026	0.0780*	0.753***	-0.0599***	-0.1118***	0.1717***
	(0.273)	(0.0013)	(0.0126)	(0.0341)	(0.0198)	(0.0452)	(0.277)	(0.0231)	(0.0406)	(0.0613)
Dissonance_1	-0.462	0.0010	0.0190	0.0573	-0.0025	-0.0749	1.000**	-0.0795**	-0.1485**	0.2280**
	(0.376)	(0.0013)	(0.0164)	(0.0469)	(0.0191)	(0.0616)	(0.424)	(0.0355)	(0.0615)	(0.0943)
Dissonance_2	-1.125***	0.0025	0.0462**	0.1395***	-0.0061	-0.1821***	-0.301	0.0240	0.0447	-0.0687
	(0.288)	(0.0027)	(0.0180)	(0.0366)	(0.0462)	(0.0520)	(0.292)	(0.0234)	(0.0431)	(0.0662)
N		382						384		

Online Table 6C: Establishment Performance, Management Practices (MP), and Management-Employee Dissonance Using Raw Variables er15e and q42a_c

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					Coefficient	B. Labor productivity growth		
		Marginal effects (outcome-category in ascending order)						Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.507*	-0.0036	-0.0201	-0.0672*	0.0087	0.0822*	0.753***	-0.0596***	-0.1117***	0.1713***
	(0.270)	(0.0029)	(0.0124)	(0.0359)	(0.0234)	(0.0452)	(0.276)	(0.0230)	(0.0403)	(0.0610)
Dissonance_1	-0.666*	0.0047	0.0264	0.0883*	-0.0114	-0.1080*	0.706*	-0.0559*	-0.1046*	0.1605*
	(0.350)	(0.0038)	(0.0161)	(0.0464)	(0.0307)	(0.0588)	(0.375)	(0.0306)	(0.0549)	(0.0840)
Dissonance_2	-0.454	0.0032	0.0180	0.0602	-0.0078	-0.0737	-0.427	0.0338	0.0633	-0.0970
	(0.497)	(0.0040)	(0.0205)	(0.0660)	(0.0222)	(0.0814)	(0.535)	(0.0427)	(0.0789)	(0.1211)
N								382		

Online Table 6D: Establishment Performance, Management Practices (MP), and Management-Employee Dissonance Using Raw Variables er15e and q44

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					B. Labor productivity growth			
		Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.574**	-0.0039	-0.0234*	-0.0724**	0.0062	0.0936**	0.708***	-0.0548**	-0.1080***	0.1629***
	(0.269)	(0.0031)	(0.0131)	(0.0341)	(0.0262)	(0.0457)	(0.272)	(0.0222)	(0.0408)	(0.0609)
Dissonance_1	-0.670***	0.0045	0.0273**	0.0845***	-0.0072	-0.1092***	0.008	-0.0006	-0.0013	0.0019
	(0.231)	(0.0033)	(0.0127)	(0.0295)	(0.0305)	(0.0405)	(0.232)	(0.0180)	(0.0355)	(0.0535)
Dissonance_2	-0.145	0.0010	0.0059	0.0182	-0.0016	-0.0236	-0.827	0.0640	0.1262	-0.1902
	(0.692)	(0.0047)	(0.0283)	(0.0873)	(0.0099)	(0.1128)	(0.755)	(0.0592)	(0.1146)	(0.1727)
N		384					384			

Online Table 6E: Establishment Performance, Management Practices (MP), and Management-Employee Dissonance er15e and q20_c

Variable	Outcome (Establishment performance)									
	Coefficient	A. Financial situation					B. Labor productivity growth			
		Marginal effects (outcome-category in ascending order)					Coefficient	Marginal effects (outcome-category in ascending order)		
		1	2	3	4	5		1	2	3
Overall index of MP	0.468*	-0.0030	-0.0202	-0.0611*	0.0090	0.0753*	0.790***	-0.0622***	-0.1194***	0.1816***
	(0.266)	(0.0026)	(0.0131)	(0.0349)	(0.0234)	(0.0444)	(0.272)	(0.0227)	(0.0404)	(0.0605)
Dissonance_1	-0.117	0.0008	0.0050	0.0152	-0.0023	-0.0188	0.059	-0.0047	-0.0089	0.0136
	(0.448)	(0.0029)	(0.0194)	(0.0584)	(0.0103)	(0.0721)	(0.468)	(0.0368)	(0.0707)	(0.1075)
Dissonance_2	-0.521	0.0034	0.0225	0.0680	-0.0101	-0.0839	-0.278	0.0219	0.0420	-0.0638
	(0.418)	(0.0035)	(0.0193)	(0.0548)	(0.0266)	(0.0686)	(0.452)	(0.0358)	(0.0682)	(0.1038)
N		397					397			

Note: See notes to Table 6.