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## Trust and workplace performance

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# Trust and workplace performance

## Abstract

This paper explores the relationship between trust and establishment performance. The outcome indicators are management's assessment of the economic or financial situation of the workplace and its relative labor productivity. Trust is initially measured using the individual survey respondent's assessment of the 'contribution' of the other side, the rating of the employee representative being favored over that of management as less subject to feedback from performance. Although the potential endogeneity of employee trust is taken into account, an improved measure is constructed from the discrepancy or dissonance between the assessments of the two sides as to the quality of industrial relations at the workplace. All trust measures are associated with improved establishment performance. However, there is no suggestion from specifications using the two more favored trust measures that any one type of formal workplace representation – either works councils or union bodies – is superior. Dissonance, if indeed exogenous, demonstrates that good industrial relations trump type of workplace representation.

JEL-Codes: J500.

Keywords: trust, dissonance, workplace employee representation, economic/financial performance, labor productivity.

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*“It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence.” (Arrow, 1972: 357)*

## **1 Introduction**

The role of trust, or the tendency to cooperation, is being accorded more attention in the economics literature at both the macroeconomic and microeconomic levels. At the macroeconomics level, in addition to long-standing work on the role of trust in the process of economic growth and economic development (Knack and Keefer, 1997; Zak and Knack, 2001),<sup>1</sup> recent studies have examined the relation between trust and unemployment (Blanchard and Philippon, 2004), trust and labor laws (Algan and Cahuc, 2009), and trust and social pacts (Den Butter and Mosch, 2003). At the microeconomics level, there has been work on the role of trust in financial decision making (Guiso et al., 2008), of social capital in overcoming various public goods problems (Putnam, 1993), and on the importance of cooperation between strangers for the success of large firms (La Porta et al., 1997). Trust has also played a role in a variety of other disciplines such as psychology (Rempel et al., 1985), political science (Kaase, 1999), and sociology (Coleman, 1988). Latterly, it has spread to human resource management and collective bargaining with research exploiting the effects of specific workplace practices such as autonomy on employee trust in management (Blunsdon and Reed, 2003; Grund and Harbring, 2009; Marsden, 2015) and the effect of changing bargaining structures on trust (Brandl and Ibsen, 2017; Nienhuser and Hossfeld, 2011).

The present paper is in the spirit of the firm performance literature but investigates more direct measures of trust and is anchored in labor relations. More precisely, we will investigate the trust of management in its employee representation body (either a works council-like body or a union entity) and the trust of the employee representation agency in management, in a cross-country setting. In a new departure, we will also deploy a bilateral measure of (absence of) trust, which we term *dissonance*. In each case, the focus is upon the perceptions of a single respondent: the most senior individual in charge of personnel in the establishment and his/her employee representative counterpart. Note that the institutional distinction between the two types of employee workplace representation in the literature is most often justified on the basis of the more thorough-going informational, consultative, and, ultimately, participative/codetermination roles of the works council and its supposedly dampened rent-seeking propensity vis-à-vis union agency (Freeman and Lazear, 1995; Addison, 2009).

Our primary dataset is the European Company Survey (ECS) for the years 2009 and 2013. Our empirical analysis is restricted to the original EU-27 nations plus Croatia. In each year the survey is conducted in two stages: the first is an interview with the senior manager (the Management {or MM} Questionnaire) while the second comprises a shorter interview with an employee representative (the Employee Representative {ER} Questionnaire) in only those

establishments with an employee representative body. The ER Survey is a necessarily smaller sample as, most obviously, the workplace may not have any workplace representation entity. Although matching is immediate in the case of 2009 ECS – the variables are provided in a single dataset with a unique establishment identifier – this is not the case for the later survey which therefore requires a procedure to match the ER units to the corresponding MM dataset.

Our outcome indicators are economic/financial performance in 2009/2013 (defined on an ascending 5-point scale) and relative labor productivity for 2009 (ascending 4-point scale). Accordingly, our estimations will comprise ordered probits (or ordered logits), and for ease of exposition we will focus on marginal effects of the key RHS variables for each category of workplace performance. As noted earlier, our key explanatory variables are management trust and employee representative trust, both given on an ascending 1-5 scale in 2009 (1-4 scale in 2013). Other regressors, in addition to type of workplace representation, include establishment-level labor productivity growth over the preceding three years, changes in organization of work and production, and collective bargaining arrangement.

Our test procedures are organized along the following lines. We first examine the relationship between management trust and establishment performance, as has most often been tested in the empirical literature. But management trust and establishment performance are likely to be highly positively correlated because positive economic performance boosts management trust – reverse causation or feedback – or because there is some underlying factor correlated with both trust and performance (e.g. the firm’s type, enabling it to attract inherently reliable/trustworthy workers). Although reverse causation can be reduced by introducing labor productivity growth, measurement errors in management trust and in management’s perception of economic performance are also likely to be highly correlated. This latter problem can be mitigated by replacing management trust with *employee trust* (Brown et al. 2015). We therefore replace management trust with a measure of employee trust. Although an improvement on the previous indicator, one cannot exclude the possibility that in good (bad) times firms are more (less) generous, which impulse may in turn serve to ‘contaminate’ employee views on trust. Accordingly, we shall therefore also seek to instrument employee trust, using strike incidence and the perceived degree of influence of the employee representation body on management decision making as separate instruments.

However, given a preference for an exogenous trust variable, a bilateral measure, fashioned from the perceptions of both parties recommends itself. That is, we shall propose an alternative measure of trust that reflects divergence between the opinions of the employer and employee representative as to the state of industrial relations at the workplace, the greater the divergence the more unfavorable the performance outcome. Specifically, we propose two dichotomous variables designed to reflect sharply divergent views of the parties, with either management claiming the industrial relations situation is ‘very good’ or ‘good’ and the

employee representative arguing to the contrary that it is best described as ‘hostile,’ and vice-versa. (Agreement between the two sides to the effect that the work climate is unambiguously favorable provides the reference category.)

A final hypothesis, drawing on the established finding that the effect of workplace representation is not a datum coupled with Freeman and Medoff’s (1984: 179) conjecture to the effect that “... unionism is neither a plus nor a minus to productivity. What matters is how unions and management interact at the workplace,” is that trust may be present at the workplace irrespective of the type of representation. In short, the much vaunted benefits of one form of workplace representation over another are a chimera.

The plan of the paper is as follows. We first provide in section 2 a thematic review of the literature investigating the role of trust as a means of securing micro and macro flexibility, before turning to the narrower focus on the workplace per se and those studies examining the relationship between trust and financial performance, labor productivity, and product quality. Next, Section 3 outlines the ordered logit/probit models as well as a summary of the expected relationships between institutions, trust, and the performance indicators. Section 4 describes the unique cross country dataset(s) used in the present inquiry and the construction of the key dependent and independent variables. Presentation of our detailed findings structured by trust and performance measure follows in section 5. Section 6 concludes.

## **2 Literature Review**

As was noted earlier, much attention in the economics of trust has been given over to its role in the process of growth (and development). If more research has been undertaken in this area than others, it remains the case that the importance of trust in growth has not gone uncontested (e.g. Solow, 1995), that causality casts a particularly long shadow which in turn makes it difficult to derive results on the basis of simple cross-country regressions, and that much work remains to be done to provide a reliable measure of trust that does not depend on a single survey question. As a result, in discussing the macro literature, we will restrict our attention to less ambitious analyses that have a more direct bearing on our study of workplace related issues.

The first relation we examine here is that between trust and unemployment. Studies have used data on trust reported in the 1999 Global Competitiveness report published by the World Economic Forum (WEF), the measure being based on the responses of senior executives to the question “are labor relations in your firm cooperative?” Strong correlations have been reported between the country mean of this trust measure and the contemporaneous unemployment rate for OECD countries, with increases in trust associated with decreases in unemployment.

A key treatment is Blanchard and Phippon (2004), who offer a multivariate analysis of labor relations and unemployment, 1965-2002. Their basic argument is that in countries where

wages are largely determined by collective bargaining, the effect of unemployment on changes in the economic environment will depend in large part on the speed of learning of unions. The latter is seen as a reflection of the quality of dialogue between the two sides, or the quality of industrial relations, which is (first) proxied by strike intensity averaged over 1960-67. In practice, they also use a second, direct measure based on the survey responses of senior executives, noted earlier.

The authors proceed by regressing unemployment in each of four decades (1965-74, 1975-84, 1985-94, and 1995-2002) on the strike intensity measure and then on the perceptions measure. Further, given that the outcome measure might be reflected in the responses of managers via a feedback effect, they use the strike data for the 1960s to provide a predicted value for the 1999 survey measure. The simple regressions indicate a strong and statistically significant effect of each of the quality of industrial relations measures on unemployment. In a final step, Blanchard and Philippon interact the instrumented measure of the quality of industrial relations with unobservable shocks common to all countries in the sample. It is reported that strikes remain positively related to unemployment, although the point estimates decline somewhat in absolute magnitude. The bottom line of this inquiry is that countries with inferior labor relations/lower trust have paid a stiff price in terms of elevated joblessness.<sup>2</sup>

In fact, the indicator of cooperation or trust is but one of nine institutional variables (e.g. employment protection) in the Blanchard-Philippon model. Recent work on trust has questioned the assumed exogeneity of these labor market institutions, as well as the effect of laws in the quality of industrial relations. On the former question, Algan and Cahuc (2009) have examined the balance between two related labor market institutions designed to offer protection from job loss, namely unemployment insurance (UI) benefits and job protection legislation. They report that countries displaying high civic values, based on responses to survey questions on attitudes to claiming UI benefits, tend to insure workers through benefits as opposed to stringent employment protection rules. On the latter question, Aghion et al. (2009) have examined the negative association between state regulation of minimum wages and the quality of industrial relations, again using Global Competitiveness Report data. It is posited that distrustful industrial relations will lead to low unionization and an elevated demand for state regulation of wages. Once in place, strong state regulation crowds out worker negotiation and learning about the potentially cooperative nature of industrial relations, implying multiple equilibria and instances of inefficiency and low trust.

A final major application of trust in labor market analysis has focused on social pacts. Subject to their being contingent institutions that are difficult to negotiate and stabilize even when accompanied by supportive networks, one strand of research has seen their success as reflecting mutual trust among the economic actors and in their failure the converse. As an example of the former, the improvement in the Dutch economy after 1982 has been linked to



that nation's culture of a search for consensus in combination with a far-reaching institutional structure that is widely acknowledged to have produced an environment of mutual trust and cooperation. The manner in which the *polder model* has been able to produce interpersonal and inter-organizational trust, and the economic policies that have resulted is chronicled by Den Butter and Mosch (2003). Their treatment that addresses the social characteristics of the drive for consensus, the major players involved in policy, and the incentives offered the parties in wage negotiations at national, industry, and micro levels to cooperate and reach agreement. In the latter context, much attention is placed upon the hold-up process that characterizes the wage setting process and where the solution to opportunism takes the form of assigning the right to adjust contracts to a higher level.<sup>3</sup>

To complicate matters, however, note that instead of requiring trust, pacts may substitute for it. Thus, it has been argued that the social pacts of more recent vintage are a far cry from the corresponding policies in the 1970s that involved a political exchange of wage restraint for policy concessions (Hassel, 2003). The new pacts, so the argument runs, represent interactions between governments and unions in which the former set tighter conditions for wage bargaining. The otherwise 'unlikely' countries with new pacts offers some support for this revisionist interpretation.

A bridging study between the above macroeconomic analyses (and the growth literature) and micro studies of the role of employee trust in the workplace is La Porta et al. (1995) who investigate the effect of trust, derived from 1990-1993 World Values Survey (WVS) data on the sales performance of large organizations in 40 countries.<sup>4</sup> Note that the WVS, which is commonly used in the growth literature, surveyed 1,000 randomly selected people in 40 countries in the early 1980s and early 1990s. Specifically, the authors' measure of the relative success of large firms is the total sales of the largest 20 publicly traded firms in a country relative to GNP, while the measure of trust is provided by the percentage of individuals in the WVS answering affirmatively to the question: *generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?* It is hypothesized that trust is most needed to secure cooperation in large organizations whose members interact with each other only infrequently because they are seldom involved in joint production – quite unlike the relationships in smaller family firms which institutions are said to be prevalent in low trust societies. It is reported that, holding GNP constant, a one standard deviation in trust increases the share of the top 20 firms by 7 percentage points or one-half of a standard deviation.

A considerable literature has been devoted to analyzing the impact of labor relations quality on firm performance. Labor relations quality has most often been evaluated on the basis of unionization presence; either negatively in the spirit of the union monopoly model, or positively in the framework of collective voice (Freeman and Medoff, 1984; Freeman and

Lazear, 1995). We do not separately examine this broad-brush ‘effects literature’ here, partly because our data set *including trust* does not allow us to compare workplace representation with its absence and partly because the empirical literature on favorable union effects is not compelling. Furthermore, although there is a theoretical presumption in favor of works councils (see Freeman and Lazear, 1995), the impact of that other worker representation entity is clearly not a datum (Addison, 2009).

Our attention thus shifts to the literature using indirect and direct measures of trust. Examples of the former are studies using strikes (Kleiner et al., 2002; Krueger and Mas, 2004), grievances (Ichniowski, 1986; Katz et al., 1983), absenteeism (Katz et al., 1983), and the styles and approaches of leaders of unions (Kleiner et al., 2002). Such case studies, examining different plants of the same firm in the automobile, aircraft and paper mills industries, point to the adverse effect of a poor climate of industrial relations, thus proxied, on measures of productivity or product quality.

However, our interest is in studies seeking more direct measures of trust in a nationally representative sample framework that enable us to examine causality more thoroughly. However, we pause to note that one of the above case studies surveys the labor climate. Thus, in their investigation of industrial relations performance in 18 automobile plants automobiles, Katz et al. (1983) employ a climate variable based on five survey questions measuring the state of labor-management relations in each plant based on a survey administered to all managerial and supervisory employees in the plant. A more cooperative climate between the local union and management was found to be associated with lower grievance rates and absenteeism, the former argument in particular being linked higher product quality and improved direct-labor efficiency. A subsequent case study by Deery and Iverson (2005) of organizational performance in 350 branches of a multinational banking organization reported that perceptions of a cooperative labor relations climate were associated with higher levels of branch productivity and customer service. These perceptions were obtained from a detailed multi-item survey administered to employees at two points in time.

Turning in conclusion to micro analysis that uses large-scale data sets, the principal study and that closest to our own is by Brown et al. (2015).<sup>5</sup> The authors examine the relation between employee trust in their managers and subjective measures of relative financial performance, labor productivity, and product quality in British establishments using the Workplace Employment Relations Surveys for 2004 and 2011 (n=1432 and n=1559, respectively), corresponding to pre- and post-recession periods. The Employee Questionnaire of the WERS provides a measure of employee trust at the individual level for samples of up to 25 employees per workplace. These employees are asked whether they strongly agree, agree, neither agree nor disagree, or strongly disagree with statements on four types of trust in managers (e.g. *managers can be relied upon to keep their promises*). Their responses are used to

establish four trust indices each in ascending order of trust. Averages of the four trust measures in each workplace are then matched with the three relative workplace performance indicators. Each of the latter conform to four-point indices, again in ascending order of performance. Four ordered probit specifications are modeled for each of the three measures of performance conditional on each of the four employee trust measures, together with a detailed set of controls. Brown et al. report a positive relationship between the measures of workplace performance and average trust for the two waves of the WERS. Although employee trust in managers is to be preferred to a management sourced measure on reverse causality grounds, there is still an issue of endogeneity with the favored trust measure as was noted earlier. In recognition of this potential problem, the authors also jointly model average employee trust and firm performance in an instrumental variable framework. Two instruments for (average) employee trust in management are constructed: first, the proportion of employees in the workplace who are religious; and, second, a variable fashioned from the ability of the manager to keep the employees informed. Their exogenous trust results prove robust to both IV procedures and also survive controlling for unobserved time invariant firm level heterogeneity using a first difference estimator in which changes in workplace performance between 2004 and 2011 are regressed on changes in the average level of trust in managers and on other time-varying covariates, albeit for very small longitudinal subsample of establishments (n=584).<sup>6</sup>

### **3 Modeling strategy**

In a typical trust game, with self-regarding preferences, the *sad* outcome in which the parties generate an inefficient non-cooperative solution is certainly a possibility. Theoretically, the cooperative outcome can be achieved if the trustor has the ability to punish with revenge, that is, to impose on the trustee some utility-increasing penalty for the lack of ex-post cooperation. However, the ability to devise a proper set of punishments with revenge that simultaneously elevates trust without sacrificing overall performance may be difficult to achieve in practice. One may in turn conceive of formal workplace employee representation as a useful vehicle through which trust is enhanced and, in consequence, cooperation improved. Whether trust is higher in establishments with employee representation than in establishments without any form of representation is an empirical question that we are unable to address in the present study as we can only *observe* trust in those establishments with a formal apparatus of workplace employee representation, either a trade union agency or a works council type entity. Moreover, for this particular sample, the extent to which the actors trust one another, and whether the level of trust and the type of worker representation matter for establishment performance, remain to be determined. The main difficulty resides in the construction of a proper measure of trust that allows us to determine its true role, conceived of as something inherently capable of generating a higher level, cooperative outcome.

There are several channels through which trust is expected to exert a positive influence upon performance. One possible channel is via a reduction in uncertainty and therefore a lowered risk that higher employee effort will go unrewarded by the employer (e.g. Brown et al., 2015). In this case trust impacts worker effort favorably, leading us to anticipate a positive association between trust and performance. A broader implication is that less uncertainty in the economic environment will improve trust, as a less contentious link between effort and performance is now more likely. Accordingly, other things being equal, trust should be lower in recessions. Performance also depends on workers' skills and their accumulated human capital. The incentive to participate in human capital acquisition is higher if workers are confident that the corresponding effort is sufficiently rewarded and not subject to hold-up. We expect that trust will have the ability to generate improved establishment performance through this channel as well. Finally, greater worker effort can be induced if workers are well aligned with organizational practices. The argument here is that a 'detached' workforce is not good for worker effort and that worker identity can be fostered by trust (Akerlof and Kranton, 2005).

In this setting, one expects management trust – specifically, management's view of employee representation – to be highly positively correlated with performance, either because true trust may be present, leading to improved performance, or because management's view of employee representation will tend after all to reflect its perception of performance. Clearly, if the latter element (i.e. reverse causation) is present, one cannot be sure that establishment performance is high *because* trust is high at the establishment – or, for that matter, exclude the possibility that, had trust been low, performance might nevertheless be high.

In principle, reverse causation is less severe a problem if *management trust* is replaced by *employee trust*, where the latter is given by the assessment of the employee representative to the effect that, say, *management can be trusted*. The rationale here is that workers – and their representatives – are mainly concerned with wages and working conditions, rather than the establishment's economic performance. Also, possible measurement error in the subjective employee trust variable is likely to be unrelated to measurement error in management's subjective assessments of economic performance (see Brown et al., 2011). However, although employee trust seems clearly preferable to management trust, establishment performance is also likely to contaminate employees' views on true trust. A standard remedy in this case is to instrument employee trust (see below).

Yet there remains a less artificial strategy available to us in the form of an alternative trust measure. Specifically, we exploit the notion of *dissonance*, that is, the difference between the views of management and the employee representative as to the state of trust. The critical point here is that dissonance and non-dissonance cases are sufficiently distinct from each other to allow identification of a relevant parameter or, expressed differently, does dissonance between the two parties matter? The expectation is that a lack of mutual trust implies a reduced

performance. In other words, even if one concedes that the cases of non-dissonance (in which the parties state that they trust each other) may not be fully indicative of genuine trust between the parties, they are likely to be sufficiently distinct from those situations in which the parties patently diverge in their opinions. (As noted earlier, all cases in which the parties both state that they do not trust each other are dropped from the sample.) By construction, then, dissonance captures a more basic concept of trust than any single party-based measure.

A final aspect is related to the type of workplace representation. As noted earlier, there are grounds for anticipating that workplace representation through works councils might outperform that via unions. However, if trust – that is, effective interaction between management and employee representation at the workplace – is ultimately all that matters then the type of workplace agency per se might be *neither a plus nor a minus* to performance (Freeman and Medoff, 2004: 179). In this case, we would not expect establishment performance to be highly statistically associated with the form of employee representation.

To formalize our testing procedures, we specify a multilevel mixed effects ordered logistic model as follows:

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

where  $H(\cdot)$  is the logistic cumulative distribution function. The management subjective measure of performance in establishment  $i$  and country  $j$ ,  $y_{ij}$ , is an ordered response, that is, a categorical and ordered variable, from low to high, while  $\boldsymbol{\kappa}$  denotes the corresponding set of cut-points. Establishments in this framework are clustered in countries, with  $\mathbf{u}_j$  giving the set of country random intercepts. For compactness,  $X_{ij}$  contains all the explanatory variables, including trust and type of workplace representation at establishment level. The full set of establishment characteristics is described in the data section below.

In practice, the method amounts to computing the probability that the score  $S_{ij}$  is less than  $\kappa_1$  to obtain the probability that the financial performance is in category 1.  $S_{ij}$  is defined as  $S_{ij} = X_{ij}\boldsymbol{\beta} + z_{ij}\mathbf{u}_j + e_{ij}$ . The probability that  $S_{ij}$  is between  $\kappa_1$  and  $\kappa_2$  will in turn give the probability that establishment performance is in category 2; and similarly for the remaining performance categories. The exercise is carried out for two separate cross-sections, 2009 and 2013, using the *meologit* command in Stata 15.0, except in the instrumental variable (IV) approach, which is described below.

As a first step, we use management trust in order to confirm the expected correlational relationship. Next, we replace management trust by the employee trust indicator, while the IV approach enters as a third step. The latter is designed to control for the possible endogeneity of employee trust, which under certain conditions permits the discussion of causal effects. To simplify matters, consider the structural model in which the relevant outcome  $y$  is a function of  $T$  and  $X$ , where  $T$  denotes trust and  $X$  the set of control variables. Assume further that  $T$ , the

endogenous variable, depends on  $Z$ , the (excluded) instrument, and  $X$ . Then, the coefficient on  $Z$  is necessarily statistically significant in the first-stage, reduced form equation for  $T$ ; otherwise, the instrument is meaningless. Further, given the assumed relationship between the first-stage equation and the structural model, if one regresses  $y$  on  $Z$  and  $X$ , the coefficient on  $Z$  is also expected to be statistically significant; otherwise, the instrument relevance assumption fails, meaning that the effect of  $T$  on  $y$  was falsely assumed to be working exclusively through  $Z$ .

Much hinges therefore on the selection of a valid instrument, and in our cross-section data there are no obvious instruments for trust. One possibility is to use strike incidence measured at establishment level. In this case, we assume that strikes as illustrative of bargaining failure are also an indicator of trust. An alternative is to use information on the influence of the employee representation body on some key management decisions, which may also be taken as an indicator of trust. In either case, the underlying hypothesis is that these variables only influence performance through their ability to affect trust. No direct effect is therefore supported. Given that *meologit* command in Stata does not support the IV implementation, we use the Conditional Mixed-Process (CMP) framework (Roodman, 2011), which accommodates the presence of an endogenous variable within a multi-level (clustered) data framework.<sup>7</sup>

Good instruments are only as good as the data, and our final test seeks to rely less on the implicit assumption that the selected instrument ought to be correlated with the trust variable but not with performance. In this case, as described earlier, we use a measure of dissonance or the deviation in stated trust between the two parties. As dissonance is likely capturing some more fundamental (inverse) measure of trust, its presence is also expected to transcend any positive influence of type of workplace agency.

#### **4 Data**

Our data are taken from the Management (MM) and Employee Representative (ER) Questionnaires of the second (2009) and third (2013) European Company Surveys (ECS), which are provided by the U.K Data Service site at <https://www.ukdataservice.ac.uk/>. We restrict our analysis to the original EU-27 countries, plus Croatia. For this subset, in 2009 a total of 25,140 (6,376) establishments were surveyed in the MM (ER) Questionnaires. The corresponding totals for 2013 were 24,471 and 6,919, respectively.

The 2009 and 2013 ECS raw datasets contain no establishment identifier, which means that there is no link connecting the two files. We have therefore two repeated cross-sections with no longitudinal content. The use of repeated cross-sections has, however, the advantage of allowing the evaluation of whether the selected relationships are stable over time, especially against the backdrop of the Great Recession.

In 2013, the MM and ER questionnaires were provided in separate files. Implementation of a matching procedure is therefore required so that the variables from the two data sources can

be used for regression purposes. This key procedure is described in the Appendix and amounts to devising a strategy that uniquely maps the ER units to the corresponding MM dataset.

Given the emphasis on the management-employee representation trust relationship, our estimation sample is necessarily confined to establishments with (a formal) employee representation. However, since management trust (in employee representation) can be measured in all establishments with a formal workplace representation for which there is a valid management response, while employee trust (in management) is only restricted to the set of establishments with a valid response from the employee representative, the sample of establishments with a valid management trust indicator is larger than the corresponding set of establishments with a valid employee trust indicator. The latter sample is further restricted in 2013 as employee trust observations in this cross-section need to be extracted from the MM-ER matched sample if one wants to control for establishment characteristics that are only available in the MM survey.

The coding of the type of workplace employee representation is also central in our approach. First, as was noted earlier, our focus is upon formal representation, either in the form of a trade union entity or a works council type of representation at the establishment. We also have information on informal representation which refers to any ad hoc form of worker representation (e.g. pure occupational safety and health committees) but net these bodies out. Second, and more importantly, as union and works council bodies can both be present in some establishments, we adopt the terminology of a *prevalent union agency* (or a *prevalent works council*) to encompass situations in which one type dominates. More precisely, a prevalent union agency obtains in circumstances where there is either a unique union agency at the workplace or where the union agency can be adjudged more influential than the corresponding works council agency where both entities are present; and similarly for a prevalent works council. This procedure has the advantage of generating a unique allocation of union/works council status as the identity of the employee representative respondent is known with certainty. (The raw variables that identify the respondent in the 2009 and 2013 surveys are given by ER\_resp and er\_type\_er, respectively.)

The MM survey provides management's views on establishment-level performance and trust. In the former case, the respondent (defined as the most senior person in charge of personnel in the establishment) is asked to give a score as to the economic/financial situation of the establishment.<sup>8</sup> In the latter case, the respondent gives a score on the management-employee representation relationship. Relative labour productivity, defined as labor productivity in the establishment as compared to other establishments in the same sector of activity, is the alternative performance measure. This indicator is only available for 2009.

As far as possible, we select the same questions in the 2009 and 2013 surveys. For example, in 2009 respondents are asked about the economic situation, whereas in 2013 the

question pertains to the financial situation. In the case of management trust in 2013, respondents are asked whether *employee representation can be trusted*; in 2009, however, this item is not available and it is replaced by the question on whether the *employee representation helps us to find ways to improve workplace performance*. An analysis of the sensitivity of the results to the use of alternative measures of trust is reported in our regression findings in section 5 below.

Establishment-level characteristics are also extracted from the MM questionnaire. They include sector (industry) affiliation, establishment size (number of employees), single versus multi-establishment organization, as well as workforce composition by skill and occupation, worker participation in on- and off- the-job training, type of wage collective agreement, labor productivity growth, and presence of performance-based pay schemes in the organization. Changes in the organization, that is, changes in the remuneration system, work process, working time, and recruitment policies are also extracted from the management questionnaire. These variables are described in Appendix Table 1.

The employee representation questionnaire in turn provides the views of the employee representative on trust. Specifically, in 2013, the respondent (defined as the person who is entitled to represent the opinions of the leading employee representation body at the workplace) is asked whether *management can be trusted*. This wording was not contained in the 2009 survey, where we instead selected the question on whether the *relationship between management and employee representation can best be described as hostile*. Since the latter question is repeated in the 2013 ER survey, this alternative measure will serve to test for sensitivity in the reported results. The ER survey also contains information on union density at establishment level.

Based on management and employee (representative) views on trust, we finally generate a dissonance variable or inverse measure of mutual trust, which is defined as the difference between the views of management and the worker representative as to the *general climate at the workplace*. We implement this particular definition to render the dissonance variable fully comparable across the two cross-sections. In the findings section we shall also provide alternative measures for dissonance and test for robustness.

Tables 1 through 3 provide an expeditious review of our data on the key performance and trust variables. As can be seen in Table 1, establishment performance, measured by the stated economic/financial situation is predominantly high (i.e. good or very good). The corresponding average (on an ascending 1-5 scale) is 3.44 and 3.66 in 2009 and 2013, respectively. Unsurprisingly, there is an improvement over time, with 51 percent reporting that the situation is good or very good in 2009 vis-à-vis 64 percent in 2013. Interestingly, in panel (b) of the table, virtually the same average values and the same shares are observed in the set of establishments *without* employee representation. Unfortunately, as was noted earlier, we cannot measure trust in establishments without employee representation.



[Table 1 near here]

Management trust and employee trust are presented in Table 2. In 2009, management trust averages 3.71, while employee trust is higher at 4.13 (both on an ascending 1-5 scale). For 2013, management trust stands at 3.14 and employee trust at 3.02 (both now on an ascending 1-4 scale). Trust between the parties is therefore high in establishments with formal employee representation in both survey years. Note that management trust in 2009 is on average lower than employee trust, while in 2013 the situation is reversed. As performance improved from 2009 to 2013 with the recovery of the overall economy, this result may suggest that management's perception of trust may indeed be more sensitive to establishment performance than that of the employee representatives.

[Table 2 near here]

Finally, Table 3 compares establishment performance, management trust, and employee trust in the MM versus matched MM-ER and the ER versus matched MM-ER samples in 2013. As shown in the table, the reported means are virtually the same in each of the three main rows. The corresponding shares are also similar, with the difference by score (indicator) never exceeding 3 percentage points.

[Table 3 near here]

## 5 Regression results

Table 4 presents the results from the implementation of model (1) using management trust as the selected trust indicator. Regarding the economic situation in 2009, in the first main row of the table, observe that the marginal effects are negative for outcome indicators 1, 2, and 3, and positive in the case of indicators 4 and 5. In other words, a high level of (management) trust is negatively associated with a low establishment performance *and* positively associated with a high establishment performance. In short, in 2009, the evidence is that, all else constant, the higher is management trust, the better is the economic situation. Across all five ordered outcome indicators, the relationship is statistically significant at the 0.01 level.

[Table 4 near here]

This relationship between management trust and establishment performance holds in 2013, in the second main row of the table, where the reported marginal effects maintain their sign and statistical significance, and are of approximately the same magnitude. The relationship is also robust in 2009 to the introduction of an alternative performance measure, namely relative labor productivity, shown in the final main row of the table. In this case, the outcome measure is calibrated on a 1 through 4 scale. It is readily apparent that trust is positively associated with a somewhat better and a lot better labor productivity than the industry average (outcome indicators 3 and 4) *and* negatively associated with an establishment performance below and at the industry average (indicators 1 and 2). Finally, although not shown in the table, we

experimented with alternative measures of management trust (e.g. *consulting the employee representation in important changes leads to more commitment of the staff in the implementation of changes*). The same pattern of strong results obtains and is available upon request.

Regarding the role of workplace representation, the evidence seems to be in favor of a positive association between works council representation and economic/financial performance in both 2009 and 2013. However, the relationship is not statistically significant in the case of the relative labor productivity outcome, which result provides the first hint that the relationship between workplace employee representation type and performance might not survive the introduction of alternative trust measures based on employee perceptions of the social dialogue process (see below). We need also to note that for all regressions implemented in Table 4, the null of an ordinary ordered logistic model against the multilevel mixed-effects ordered logistic model is easily rejected by the data. This evidence to the effect that there is sufficient variability across countries to favor a mixed-effects implementation also holds in all the regressions reported below.

In Table 5 we replace management trust by employee trust. The main reason for so doing is to mitigate problems of reverse causation, as was discussed in the modeling section. In principle, employee trust is less contaminated by the level of establishment performance than is management trust. This implementation has also the advantage of reducing the possible correlation between measurement error in both the dependent and explanatory variables insofar as these reflect the points of view of management and the employee representative, respectively. We have therefore a measure of trust that can be thought of as potentially exogenous. Under exogeneity of employee trust, the table shows that the variable does have a positive impact on establishment performance. Indeed, the marginal effects of employee trust are always statistically significant at the 0.05 level or better, while the corresponding signs are negative for low performance scores 1, 2, and 3 (1 and 2 in the case of relative labor productivity) and positive for high scores 4 and 5 (3 and 4 in the case of relative labor productivity). In other words, if employee trust is high the chances are that establishment performance is likely to improve. The interpretation of the magnitude of the marginal effects, which are clearly larger in absolute value for relative labor productivity than for economic/financial performance, is addressed in the context of Tables 6 and 7 below.

[Table 5 near here]

For its part, the lack of statistical significance of the works council variable is now palpable, indicating that under exogeneity of trust differential effects of type of worker representation on performance might not be anticipated. *Vulgo*: if trust is all that matters, then any role attributed to type of workplace agency should be downplayed. We again observe that these results are robust to the use of alternative measures of employee trust. For example, if in

2013 we replace the baseline employee trust variable by the employee representative's opinion as to whether *the relationship between management and employee representation can best be described as hostile* the results are unchanged. (No obvious alternative is available for 2009.) Full results are available from the authors upon request.

The implication that trust begets improved establishment performance is conditional on the exogeneity of the selected trust measure. If one suspects that employee trust might be boosted by establishment performance, reverse causality reemerges as a concern. Table 6 addresses this issue by implementing an IV approach in which employee trust is instrumented by a measure of employee representation influence on management decisions. In 2009, and for the economic situation measure case, we also use strike incidence at establishment level as an alternative instrument, as was discussed in the modeling section.

[Table 6 near here]

The first main row of the table indicates that, after controlling for possible endogeneity (the instrument is the employee representative's perception of the extent of the influence of the employee representation body on career management {selection, appraisal and training} in the establishment), employee trust is significant at the 0.01 level throughout. The marginal effects are negative in the first three columns (outcome indicator levels 1, 2, and 3) and positive in the last two columns (indicator levels 4 and 5). We have therefore the result that trust produces a better economic situation, meaning that the higher is the stated level of employee trust, the higher is the probability that the establishment performance is good or very good – or, conversely, that a higher level of employee trust decreases the chance that performance will be very bad, bad, or neither good nor bad. If we replace, in the second main row of the table, employee representation influence by strike incidence (a dummy variable defined as 1 if there has been a stoppage or strike in the establishment in the last 12 months) as our selected instrument for employee trust, the same result obtains: the higher the trust, the higher is the economic performance. For example, the marginal effect of 0.0524 shown in the last column gives the approximate change in the probability that economic performance is very good as a result of a one-point change in the employee trust score. In other words, had the employee trust increased by one unit, the likelihood of a very good economic situation would increase by 5.2 percentage points.

Observe that we are here simplifying the interpretation of the marginal effect in the interests of providing a first-pass approximate magnitude of the impact of a given change in trust on performance. Taking employee trust as a continuous variable, the approximate impact on performance is computed by multiplying the estimated marginal effect by a unit change in employee trust. More precisely, where employee trust is measured as a 1 through 5 categorical variable, we need compute the separate impact of a change in employee trust from 1 to 2, 2 to 3, 3 to 4, and 4 to 5 and then take some average of the impact of one unit change in trust. In our

data, the two approaches generate an impact on establishment performance of similar magnitude. Also note that although the marginal effects given in each column are not large in absolute value, the impact of a change from, say, the lowest level of trust to the highest is, according to the reported estimates, not at all small. Indeed, the impact can be as high as 10 to 20 percentage points. Finally, observe that in no case is the works council variable is statistically significant at conventional levels.

In both the first and second main rows of the table the statistical evidence is favorable to the instrument relevance assumption. In the first main row, the coefficient of the selected instrument in the reduced-form equation for performance is equal to 0.0811, while in the second main row the corresponding coefficient is equal to -0.198. Each coefficient estimate is statistically significant at 0.05 level. In turn, both employee representation influence and strikes are also statistically significant (at the 0.01 level) in the corresponding first-stage equations, with coefficients of 0.121 and -0.368, respectively. Moreover, observe that the cross-equation correlation between the first- and second-stage equations in the CMP system, using employee representation influence as the selected instrument in the first main row, falls within the (-0.1351, -0.0629) 95% confidence interval; as is also the case for strikes in the second main row of the table. These findings, on the cross-equation correlation, mean that the assumed endogeneity in the system is supported.

Results for the relative labor productivity case are given in the third main row of Table 6. First of all, observe that the instrumental variable diagnostic statistics perform as expected. Second of all, the directional influence of trust is again confirmed. Thus, the higher is employee trust, the lower is the probability that labor productivity in the establishment is either below or at the industry average, the corresponding marginal effects being equal to -0.018 and -0.089, respectively. Equally, labor productivity is expected to be somewhat better or a lot better than the industry average if employee trust increases, with marginal effects of 0.0440 and 0.0634, respectively. The estimated marginal effects are all statistically significant at the 0.01 level.

Replication for 2013 is given in the last main row of the table. In this case, we are limited to a single establishment performance measure – the financial situation – and to using employee representation influence as the selected instrument as the strikes variable fails to achieve statistical significance in the corresponding reduced-form equation for this performance measure.<sup>9</sup> As can be seen from the table, the coefficient on employee representation influence is highly statistically significant in not only the reduced-form equation for performance (with a coefficient of 0.189 and standard error of 0.071 but also in the first-stage equation as well. The cross-equation correlation in turn falls within the (-0.116, -0.009) 95% confidence interval, while for its part the statistical insignificance of the works council variable is again confirmed.

Results from using our constructed measure of dissonance between the parties are presented in Table 7. In this case, we have establishment performance as a function of an

indicator that is presumed to reflect some underlying dysfunction at the organization. We note that in our data we do not have any micro information on, say, religious affiliation (as, for example, in Brown et al., 2015) or any indicator of “trust in people” (as in La Porta et al., 1997), which are typically assumed as good indicators of basic trust. However, it is perhaps no coincidence that in both 2009 and 2013 ‘dissonance’ is relatively low in, for example, the Netherlands and Sweden while the corresponding index of *trust in people*, as reported in the 2010-2014 World Values Survey (WVS), is relatively high.<sup>10</sup>

[Table 7 near here]

The model implementation contains two dissonance variables, that is, *Dissonance\_1* and *Dissonance\_2*. In this setting we do allow therefore for differentiated effects vis-à-vis the reference category (i.e. no Deviation). Table 7 indicates that the two terms have the expected sign, with *Dissonance\_2* always showing both strong statistical significance and larger (in absolute value) marginal effects than *Dissonance\_1*. Given that the two terms have the same sign throughout, we could have aggregated them into a single dissonance variable. For completeness, we prefer to persevere with a specification that includes two dissonance variables.

Beginning with the results for 2009 in the first main row of Table 7, dissonance between the parties as measured by *Dissonance\_2* implies an approximately 3.4, 10.7, and 12.9 percentage point increase in the probability that the economic situation is very bad, bad, and neither bad nor good, respectively, in comparison with a circumstances in which the two parties do not deviate (that is, where both parties agree that the industrial relations climate is good or very good). Conversely, *Dissonance\_2* implies reductions of 16.1 and 10.9 percentage points, respectively, in the probability that the economic situation is good or very good. These marginal effects are statistically significant at the 0.01 level. For its part, *Dissonance\_1* is never statistically significant.

Turning to the second main row of the table and the slightly different outcome measure for 2103 that now refers to the financial situation, the marginal effects of *Dissonance\_2* are 2.3, 8.9, and 18.1 percentage points for categories 1, 2 and 3, respectively, and -13.5 and 15.7 percentage points respectively for categories 4 and 5. These are clearly sizeable magnitudes, suggesting that dissonance between the parties can be very damaging for establishment performance vis-à-vis the situation where there is no stated disagreement between the viewpoints of the two parties.

This evidence for the relative labor productivity outcome is shown in the last main row of the table. The *Dissonance\_2* term is again statistically significant at the 0.01 percent level, with the reported marginal effects implying that (this type of) dissonance between the parties increases the probability that labor productivity in the establishment is below or at the industry average, on the one hand, and decreases the probability that labor productivity in the

establishment is somewhat or a lot better than the industry average, on the other. The marginal effects are 1.2, 12.2, -6.5, and -6.9 percentage points, respectively. The corresponding marginal effects for *Dissonance\_1*, which again have the same sign as the *Dissonance\_2* term but which are now statistically significant at conventional levels, are 0.5, 5.1, -2.7, and -2.9 percentage points.

Regarding the role of the works council, we again find no hard evidence that this body is strongly associated with higher performance than the alternative type of workplace representation in the form of a union entity. The works council dummy variable is not statistically significant in 2009 and in 2013 it only achieves statistical significance at the 0.10 level.

As a final exercise, we sought to test the sensitivity of the results presented in Table 7 to alternative dissonance measures. That is, although the definition of dissonance between the parties, based on their (independent) views on industrial relations climate at the establishment, has the virtue of making the results fully comparable across 2009 and 2013, we thought it worthwhile experimenting with alternative components of the measure. Specifically, for 2009 we replaced management's view of the industrial relations climate by our selected management trust variable (obtained by using the question on whether *the employee representation helps us to find ways to improve workplace performance*) but retained the other component as no real alternative to the employee trust variable was available for 2009. For 2013 we experimented with an alternative measure of dissonance, in which we replaced the baseline employee representative view of industrial relations at the establishment by our selected measure of employee trust (given by the *management can be trusted* indicator).

As can be seen from Appendix Table 2, there is no evidence that the results reported in Table 7 are sensitive in any fundamental sense to these changes. Thus, for both the economic situation measure and relative labor productivity in 2009 we reproduce quite closely the results given in the first main row of Table 7. Further, there is also a close replication of the corresponding estimates for 2013, both with respect to the relevant magnitude of the marginal effects and their statistical significance. We also experimented with other alternative dissonance measures only to obtain much the same pattern of results. Although not reported in Appendix Table 2, they are available from the authors upon request.

## **6 Conclusions**

This study has investigated the role of trust at the workplace in influencing various aspects of firm performance, its justification being that, despite an abundant literature on employee involvement and workplace performance, the role of trust in potentially influencing the behavior of employees (and management) has been neglected, while the evidence on the role of employee

representation is decidedly mixed. The lack of attention issue is accentuated when comparisons are made with developments in macroeconomics that have embraced the concept of trust (e.g. research on economic growth, unemployment, and social pacts) and even microeconomics (e.g. financial decision making). Progress in the trust literature has nevertheless been uneven, in recognition of which we sought to accommodate or otherwise tackle feedback effects, to avoid reliance upon trust measures based on single survey questions, and to move beyond case studies to work with a large-scale data set(s). By the same token, certain uncertainties in the trust literature (e.g. attaching to laws/institutional constraints) also apply to the present treatment even if they do not seemingly impair our ability to run non-clustered cross-country regressions.

Our study has explored the relationship between trust and establishment performance using data from the 2009 and 2013 waves of the European Company Survey. The sample of countries is sizable, comprising the original EU-27 nations plus Croatia. The survey respondents are spokespersons of senior management and the key employee workplace representation body, one of each per establishment. Three subjective performance outcome measures are used, namely management's assessment of the economic/financial situation of the establishment and of its labor productivity relative to the sectoral mean. These ordered responses yield separate outcome scores that are increasing in the level of performance. For its part, trust is initially measured on the basis of the individual respondent's assessment, again ordered responses, of the 'contribution' of the other side. These responses are used to create separate trust indices or independent variables that are increasing in the level of manager/employee representative trust.

From the outset, more attention was given to the employee trust in managers' measure as it is less subject to feedback from performance than the management counterpart. Nevertheless, as noted above, employee trust and firm performance were jointly modeled in this case, using the perceived influence of the employee representation body on certain key management decisions *and* strike incidence as instruments for employee trust. Attention then shifted to a less artificial strategy to modeling the impact of trust. Specifically, we constructed a measure of workplace *dissonance* which is defined as the discrepancy between the assessments of the two sides as to the quality of industrial relations at the workplace. Initially, two dummy dissonance variables were used, the reference category being an absence of dissonance, namely agreement between the two sides that the work climate is unambiguously favorable. As with employee trust, alternative definitions of dissonance (i.e. an absence of trust) were also employed to test the robustness of the relevant baseline results for trust.

Apart from trust, the other key regressor in this examination of trust and workplace performance was the specific type of workplace representation – either a works council or a union body – present at the establishment. As both types of representation may be practised in most countries/establishments, we developed the notion of *prevalence*. A works council was deemed to be prevalent where it was either the sole form of workplace representation or, when

both types of agency were present at the establishment, by the employee representative having been identified by management as a works councilor – and *mutatis mutandis* in the case of a prevalent union body. We then sought to determine whether a putative pro-productive role of the works council emerged after incorporating the trust argument(s).

We reported that our conventional unilateral measures of (heightened) trust were consistently associated with better workplace performance in the form of improved economic/financial performance and heightened labor productivity, and conversely for our bilateral dissonance measure. The positive association between works councils and firm performance was also found for a specification that used the management trust argument. However, any suggestion that one type of workplace representation is superior to another from a performance perspective – here prevalent works council versus prevalent union agency – did not survive the incorporation of a preferred measure of trust, either employee trust or dissonance. If indeed exogenous, our dissonance measure in particular indicated that good industrial relations trumps institutional form (type of workplace representation). Seemingly, then, what ultimately matters is whether the employer and the particular employee representation body – union or works council – trust one another. Interestingly, this conclusion is much in line with Freeman and Medoff's ultimate interpretation of union influence in their summary remarks on the performance of the collective voice-institutional response model, even if their comparator is absence of workplace representation rather than as here another form of representation. As these authors write: "The lesson is that unionism per se is *neither a plus nor a minus to productivity. What matters is how unions and management interact at the workplace*" [emphasis in original] (Freeman and Medoff, 1984: 179). Although more work on trust is called for, we have sought in the present exercise to codify this exchange process and formally assess its importance.



## Endnotes

1. For the recent literature on trust and growth that emphasizes channels of influence/transmission mechanisms and causation, see Bjørnskov (2012), and Algan and Cahuc (2014).
2. See also Feldmann (2008), and for a critique Addison and Teixeira (2009).
3. In contrast to the Dutch experience, 1982-2000, the failure of negotiations on a social pact in Greece and Portugal during the most recent economic crisis have been linked, albeit altogether less formally, to a lack of trust between the governments and social partners in question.
4. The performance of large organizations is one of four outcome indicators examined in this study; the others are government efficiency, participation in civic/professional associations, and social efficiency.
5. However, brief mention of a study by Cette et al. (2013) of the impact of labor relations quality on total factor productivity in French manufacturing firms is warranted, even if the idiosyncracies of that nation's labor relations system need to be borne in mind. This large-scale study is unique in its particular emphasis on the interplay between labor relations quality or trust and labor market regulations, first exploited in the macro literature. Labor relations quality in this study is taken from a survey of firms asking them to identify constraints on capital operating time, including worker/union opposition, legal or regulatory constraints, and collective bargaining agreements. It is reported that workforce or union opposition when interacted with regulatory constraints is associated with lower total factor productivity, the intriguing idea being that workers or unions can be successful in opposing management when they threaten to invoke legislation. It is also found that that regulatory constraints when interacted with the collective bargaining constraint exert a positive influence upon total factor productivity. Here the notion is that collective agreements, which in this milieu can only be reached if labor relations are supportive, can be used by firms either to secure flexible implementation of labor laws or adapt them (given the French labor code).
6. The authors also examine the determinants of individual trust and show how this measure is eroded by management practices restricting access to overtime and training as well as work reorganization.
7. CMP fits seemingly unrelated regression (SUR) models of a large family, including the case of a categorical ordered left-hand-side variable and hierarchical (i.e. clustered) data. Provided the existence of a valid instrument, the simultaneous system becomes a recursive system, similar to a two-stage least squares regression, the first-stage being given by the reduced-form equation for trust and the second by the establishment performance equation. The corresponding test for the correlation in the error term across the first- and second-stage equations will indicate whether there is endogeneity in the system.
8. Since the raw score is actually given in descending order, from high to low, a variable transformation was required to generate an ascending scale so that the lowest score reflects the lowest performance category. Similar transformations were implemented in the cases of management trust, employee trust, and relative labor productivity.
9. Despite its the failure to achieve statistical significance in the reduced-form equation for the financial situation outcome, we note that using strikes as the selected instrument yields marginal effects comparable to those reported in the last main row of Table 6. Furthermore, the strikes variable is negative and statistically significant at the 0.01 level in the first-stage equation and the cross-equation correlation is positive and statistically different from zero.

10. In order to effect a comparison with the WVS, which it will be recalled provides a unitary trust indicator, we have to aggregate our two dissonance measures, dissonance\_1 and dissonance\_2, into a single category. Note also that only 7 countries are common to both the ECS and WVS Surveys: Estonia, Germany, The Netherlands, Poland, Romania, Spain, and Sweden. We have therefore no possibility of establishing any meaningful statistical relationship between our measure of dissonance and the WVS indicator. The question in the 2010-2014 WVS survey was as follows: “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”

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Table 1: Establishment Performance in European Establishments, 2009 and 2013 (in percent)

|  |   |        | Outcome indicator (in ascending order) |       |       |       |       |         |
|--|---|--------|--|-------|-------|-------|-------|---------|
| Sample year  | Outcome<br>(management view of establishment performance) | N      | 1                                      | 2     | 3     | 4     | 5     | Average |
| (a) Establishments with a formal workplace employee representation |   |        |  |       |       |       |       |         |
| 2009   | Economic situation [MM500]                                | 12,110 | 2.74                                   | 11.79 | 34.36 | 40.55 | 10.55 | 3.44    |
| 2013   | Financial situation [KFINAN]                              | 11,340 | 1.38                                   | 7.88  | 26.85 | 50.35 | 13.53 | 3.67    |
|  |   |        | 1                                      | 2     | 3     | 4     |       |         |
| 2009   | Relative labor productivity                               | 11,328 | 2.34                                   | 47.82 | 35.43 | 14.41 |       | 2.62    |
| (b) Establishments without workplace employee representation       |   |        |  |       |       |       |       |         |
| 2009   | Economic situation [MM500]                                | 12,145 | 2.16                                   | 8.80  | 33.85 | 43.85 | 11.35 | 3.53    |
| 2013   | Financial situation [KFINAN]                              | 12,257 | 1.31                                   | 6.74  | 29.00 | 50.24 | 12.70 | 3.66    |
|  |   |        |  |       |       |       |       |         |
| 2009   | Relative labor productivity [MM501]                       | 10,997 | 2.39                                   | 44.98 | 34.67 | 17.96 |       | 2.68    |

*Notes:* Establishment performance is a five-point indicator in ascending order, from 1 (low) to 5 (high). Relative labor productivity is given in a four-point increasing scale and it is only available in 2009.

*Source:* 2009 and 2013 European Company Surveys.

Table 2: Management and Employee (Representative) Trust in European Establishments, 2009 and 2013(in percent)

| Sample year | Trust                                     | N      | Trust indicator (in ascending order) |       |       |       |       | Average |
|-------------|---|--------|--------------------------------------|-------|-------|-------|-------|---------|
|             |   |        | 1                                    | 2     | 3     | 4     | 5     |         |
| 2009        | Management trust [MM702_1]                | 12,188 | 3.45                                 | 11.52 | 15.88 | 48.92 | 20.23 | 3.71    |
| 2009        | Employee (representative) trust [ER151_3] | 6,236  | 2.39                                 | 8     | 7.86  | 37.92 | 43.83 | 4.13    |
|             |   |        | 1                                    | 2     | 3     | 4     |       |         |
| 2013        | Management trust [er15e]                  | 11,376 | 1.07                                 | 7.92  | 66.63 | 24.38 |       | 3.14    |
| 2013        | Employee (representative) trust [q42a_c]  | 2,969  | 3.67                                 | 13.51 | 59.48 | 23.34 |       | 3.02    |

*Notes:* Management trust is extracted from the MM survey and contains all establishments in which management reports the presence of a formal employee representation body. Employee trust is obtained from the ER survey and comprises all establishments with a valid response from the representative of the workplace representation body. The information on employee trust in 2013 is generated from the constructed MM-ER data.

*Source:* 2009 and 2013 European Company Surveys.

Table 3: Management and Employee Trust in Establishments with a Formal Employee Representation Body Versus Establishments in the Matched MM-ER Constructed Data, 2013 (in percent)

| Variable                                 | Sample   | Indicator |      |       |       |       |       |         |
|--|--|-----------|------|-------|-------|-------|-------|---------|
|  |  | N         | 1    | 2     | 3     | 4     | 5     | Average |
| Financial situation [KFINAN]             | Establishments with a formal employee representation body    | 11,340    | 1.38 | 7.88  | 26.85 | 50.35 | 13.53 | 3.67    |
|  | Establishments in the matched MM-ER sample                   | 2,964     | 1.86 | 8.5   | 28.41 | 48.21 | 13.02 | 3.62    |
|  |  |           |      |       |       |       |       |         |
| Management trust [er15e]                 | Establishments with a formal employee representation body    | 11,376    | 1.07 | 7.92  | 66.63 | 24.38 |       | 3.14    |
|  | Establishments in the matched MM-ER sample                   | 2,966     | 0.84 | 7.25  | 66.12 | 25.79 |       | 3.17    |
|  |  |           |      |       |       |       |       |         |
| Employee (representative) trust [q42a_c] | Establishments with a valid employee representative response | 7,373     | 3.27 | 13.79 | 61.10 | 21.84 |       | 3.02    |
|  | Establishments in the matched MM-ER sample                   | 2,969     | 3.67 | 13.51 | 59.48 | 23.34 |       | 3.02    |

Notes: The three different selected samples in the table (i.e. *Establishments with a formal employee representation body*, *Establishments with a valid employee representative response*, and *Establishments in the matched MM-ER sample*) are defined as follows: the first contains all the establishments for which the MM Survey responder says there is a formal employee representation body at the establishment; the second is made up of all establishments with a valid employee representative response in the ER Survey; and the third is obtained using the MM Survey-ER Survey matching procedure described in the text and corresponding Appendix.

Source: 2013 European Company Survey.



Table 4: Establishment Performance, Management Trust, and Workplace Employee Representation Type, 2009 and 2013, Marginal Effects

| Year | Variable                      | Outcome<br>(establishment performance) | Outcome indicator (in ascending order) |                      |                      |                     |                     |
|------|-------------------------------|--|--|----------------------|----------------------|---------------------|---------------------|
|      |                               |  | 1                                      | 2                    | 3                    | 4                   | 5                   |
| 2009 | Management trust<br>[MM702_1] | Economic situation<br>[MM500]          | -.0039***<br>(.0007)                   | -.0138***<br>(.0019) | -.0168***<br>(.0024) | .0219***<br>(.0029) | .0127***<br>(.0019) |
|      | Works council                 |  | -.0045***<br>(.0017)                   | -.0159***<br>(.0057) | -.0194***<br>(.0071) | .0252***<br>(.0090) | .0146***<br>(.0054) |
| 2013 | Management trust<br>[er15e]   | Financial situation<br>[KFINAN]        | -.0031***<br>(.0006)                   | -.0161***<br>(.0026) | -.0328***<br>(.0048) | .0252***<br>(.0044) | .0267***<br>(.0042) |
|      | Works council                 |  | -.0022***<br>(.0008)                   | -.0112***<br>(.0038) | -.0229***<br>(.0077) | .0176***<br>(.0060) | .0187***<br>(.0064) |
| 2009 | Management trust<br>[MM702_1] | Relative labor productivity<br>[MM501] | -.0030***<br>(.0005)                   | -.0283***<br>(.0043) | .0152***<br>(.0025)  | .0160***<br>(.0026) |                     |
|      | Works council                 |  | -.0016<br>(.0014)                      | -.0155<br>(.0134)    | .0084<br>(.0072)     | .0088<br>(.0076)    |                     |

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. The reported values are the mean marginal effects. By construction, all establishments in the estimation sample have a formal employee representation body. The number of observations in the first, second, and third main rows is 9,909, 8,899, and 9,458, respectively. \*\*\* denotes statistical significance at the 0.01 level; standard errors are given in parentheses.

Table 5: Establishment Performance, Employee (Representative) Trust, and Workplace Employee Representation Type, 2009 and 2013, Marginal Effects

| Year | Variable                    | Outcome<br>(establishment performance) | Outcome indicator (in ascending order) |                      |                      |                     |                     |
|------|-----------------------------|--|--|----------------------|----------------------|---------------------|---------------------|
|      |                             |  | 1                                      | 2                    | 3                    | 4                   | 5                   |
| 2009 | Employee trust<br>[ER151_3] | Economic situation [MM500]             | -.0024**<br>(.0009)                    | -.0070**<br>(.0028)  | -.0076**<br>(.0030)  | .0106**<br>(.0042)  | .0064**<br>(.0026)  |
|      | Works council               |  | -.0017<br>(.0033)                      | -.0050<br>(.0097)    | -.0054<br>(.0104)    | .0075<br>(.0146)    | .0045<br>(.0088)    |
| 2013 | Employee trust<br>[q42a_c]  | Financial situation [KFINAN]           | -.0045***<br>(.0012)                   | -.0175***<br>(.0041) | -.0371***<br>(.0080) | .0293***<br>(.0072) | .0299***<br>(.0069) |
|      | Works council               |  | -.0020<br>(.0019)                      | -.0080<br>(.0075)    | -.0169<br>(.0158)    | .0134<br>(.0125)    | .0136<br>(.0128)    |
| 2009 | Employee trust<br>[ER151_3] | Relative labor productivity<br>[MM501] | -.0027***<br>(.0008)                   | -.0239***<br>(.0064) | .0135***<br>(.0037)  | .0132***<br>(.0037) |                     |
|      | Works council               |  | -.0024<br>(.0025)                      | -.0213<br>(.0217)    | .0120<br>(.0122)     | .0118<br>(.0120)    |                     |

Notes: See notes to Table 4. By construction, all establishments in the estimation sample have a valid employee representative response. In 2013 the sample is based on the matched MM-ER dataset. The number of observations in the first, second, and third main rows is 4,532, 2,274, and 4,344, respectively. \*\*\*, and \*\* denote statistical significance at the 0.01 and 0.05 levels, respectively; standard errors are given in parentheses.

Table 6: Establishment Performance, Employee (Representative) Trust, and Workplace Employee Representation Type, 2009 and 2013, Marginal Effects with an Endogenous Variable

| Year | Variable  | Outcome<br>(establishment performance) | Outcome indicator (in ascending order) |                      |                      |                     |                     |
|------|---|--|--|----------------------|----------------------|---------------------|---------------------|
|      |   |  | 1                                      | 2                    | 3                    | 4                   | 5                   |
| 2009 | Employee trust [ER151_3]<br>(Instrumented by employee representation influence; ER207_8)  | Economic situation<br>[MM500]          | -.0100***<br>(.0038)                   | -.0215***<br>(.0074) | -.0197***<br>(.0069) | .0284***<br>(.0097) | .0227***<br>(.0082) |
|      | Works council   |  | -.0033<br>(.0092)                      | -.0073<br>(.0196)    | -.0066<br>(.0177)    | .0096<br>(.0259)    | .0077<br>(.0205)    |
|      | Instrument relevance:<br>Coefficient of the excluded instrument in the reduced-form equation for performance: 0.0811 (s.e.: 0.0327); statistically significant at the 0.05 level.<br>Coefficient of the excluded instrument in the first-stage equation: 0.1210 (s.e.: 0.0170); statistically significant at the 0.01 level.<br>Cross-equation correlation: -.0991 (.0184); 95% confidence interval: (-.1351; -.0629).<br>N=4,416       |  |  |                      |                      |                     |                     |
| 2009 | Employee trust [ER151_3]<br>(Instrumented by strikes)   | Economic situation<br>[MM500]          | -.02456***<br>(.0039)                  | -.0441***<br>(.0054) | -.0388***<br>(.0059) | .0550***<br>(.0065) | .0524***<br>(.0082) |
|      | Works council   |  | -.0058<br>(.0092)                      | -.0104<br>(.0165)    | -.0091<br>(.0143)    | .0130<br>(.0208)    | .0123<br>(.0193)    |
|      | Instrument relevance:<br>Coefficient of the excluded instrument in the reduced-form equation for performance: -0.1980 (s.e.: 0.0934); statistically significant at the 0.05 level.<br>Coefficient of the excluded instrument in the first-stage equation: -0.3688 (s.e.: 0.0466); statistically significant at the 0.01 level.<br>Cross-equation correlation: -0.2540 (0.0172); 95% confidence interval: (-0.2875, -0.2198).<br>N=4,578 |  |  |                      |                      |                     |                     |
| 2009 | Employee trust [ER151_3]<br>(Instrumented by employee representation influence; ER207_8)  | Relative labor<br>productivity [MM501] | -.0182***<br>(.0043)                   | -.0892***<br>(.0141) | .0440***<br>(.0069)  | .0634***<br>(.0123) |                     |
|      | Works council   |  | -.0049<br>(.0076)                      | -.0240<br>(.0373)    | .0118<br>(.0184)     | .0170<br>(.0266)    |                     |
|      | Instrument relevance:<br>Coefficient of the excluded instrument in the reduced-form equation for performance: 0.1095 (0.0344); statistically significant at the 0.01 level.<br>Coefficient of the excluded instrument in the first-stage equation: 0.1168 (s.e.: 0.0167); statistically significant at the 0.01 level.<br>Cross-equation correlation: -.2180 (.0191); 95% confidence interval: (-.2553; -.1801).<br>N=4,749             |  |  |                      |                      |                     |                     |

Table 6 (cont.)

| Year   | Variable   | Outcome<br>(establishment performance) | Outcome indicator (in ascending order) |                       |                       |                     |                     |
|--|--|--|--|-----------------------|-----------------------|---------------------|---------------------|
|  |  |  | 1                                      | 2                     | 3                     | 4                   | 5                   |
| 2013   | Employee trust [q42a_c]<br>(Instrumented by employee representation<br>influence; q38) | Financial situation<br>[KFINAN]        | -0.0086**<br>(.0034)                   | -0.0252***<br>(.0087) | -0.0429***<br>(.0143) | .0339***<br>(.0125) | .0428***<br>(.0147) |
|  | Works council  |  | -0.0026<br>(.0051)                     | -0.0076<br>(.0150)    | -0.0129<br>(.0257)    | .0102<br>(.0202)    | .0129<br>(.0257)    |
| Instrument relevance:<br>Coefficient of the excluded instrument in the reduced-form equation for performance: 0.1899 (s.e.: 0.0711); statistically significant at the 0.01 level.<br>Coefficient of the excluded instrument in the first-stage equation: 0.2278 (s.e.: 0.0240); statistically significant at the 0.01 level.<br>Cross-equation correlation: -0.0630 (0.0273); 95% confidence interval: -0.1163, -0.0094).<br>N=1,643 |  |  |  |                       |                       |                     |                     |

Notes: See notes to Tables 4 and 5. The model is estimated using CMP in Stata 15. \*\*\*, and \*\* denote statistical significance at the 0.01 and 0.05 levels, respectively; standard errors are given in parentheses.

Table 7: Establishment Performance, Employee-Management Dissonance, and Workplace Employee Representation Type, 2009 and 2013, Marginal Effects

| Year | Variable      | Outcome<br>(establishment performance) | Outcome indicator (by increasing order) |                     |                      |                      |                      |
|------|---------------|--|---|---------------------|----------------------|----------------------|----------------------|
|      |               |  | 1                                       | 2                   | 3                    | 4                    | 5                    |
| 2009 | Dissonance_1  | Economic situation<br>[MM500]          | .0018<br>(.0025)                        | .0057<br>(.0079)    | .0068<br>(.0095)     | -.0086<br>(.0119)    | -.0058<br>(.0080)    |
|      | Dissonance_2  |  | .0341***<br>(.0044)                     | .1071***<br>(.0086) | .1287***<br>(.0112)  | -.1614***<br>(.0124) | -.1086***<br>(.0107) |
|      | Works council |  | -.0014<br>(.0029)                       | -.0044<br>(.0091)   | -.0053<br>(.0109)    | .0067<br>(.0137)     | .0045<br>(.0092)     |
| 2013 | Dissonance_1  | Financial situation<br>[KFINAN]        | .0032<br>(.0028)                        | .0124<br>(.0106)    | .0252<br>(.0216)     | -.0189<br>(.0163)    | -.0220<br>(.0189)    |
|      | Dissonance_2  |  | .0229***<br>(.0042)                     | .0886***<br>(.0093) | .1808***<br>(.0127)  | -.1351***<br>(.0169) | -.1573***<br>(.0159) |
|      | Works council |  | -.0033*<br>(.0019)                      | -.0128*<br>(.0071)  | -.0261*<br>(.0143)   | .0195*<br>(.0108)    | .0227*<br>(.0126)    |
| 2009 | Dissonance_1  | Relative labor productivity<br>[MM501] | .0051**<br>(.0021)                      | .0508**<br>(.0199)  | -.0272**<br>(.0107)  | -.0287**<br>(.0114)  |                      |
|      | Dissonance_2  |  | .0123***<br>(.0023)                     | .1219***<br>(.0174) | -.0654***<br>(.0101) | -.0689***<br>(.0107) |                      |
|      | Works council |  | -.0020<br>(.0022)                       | -.0201<br>(.0221)   | .0107<br>(.0118)     | .0113<br>(.0125)     |                      |

Notes: See notes to Tables 4 and 5. Dissonance\_1 and Dissonance\_2 are based on raw variables MM701 and ER151\_3 (for 2009) and KCLIMATE and q20\_c (for 2013); see Appendix Table 1 for the definition of management-employee dissonance. The number of observations in the first, second, and third main rows is 4,292, 2,283, and 4,108, respectively. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels, respectively; standard errors are given in parentheses.

## **Appendix**

### The Matching Procedure Used to Link MM and ER Establishments in 2013

The matching process can be described as a four-step procedure. Firstly, for our sample of countries in the MM dataset, we selected all establishments having valid information on the dummy variables ERTYPE\_A, ERTYPE\_B, ..., ERTYPE\_G. These variables flag the presence of a formal ER body and the specific type of worker representation actually present at the organization. In a second stage, we used all the establishments in the ER survey and generated an establishment identifier. A third stage linked the MM and ER datasets by using the common raw variables w4\_MM\_emp\_freq (i.e. the establishment weight), est\_size3 (i.e. establishment size), and NACE6\_R1\_1 (i.e. sector). In the fourth and final stage we dropped all establishments in the ER dataset for which there was no unique matching. The limitation of the matching procedure is that it was not possible to map all the ER units across to the MM dataset. The differences in observed characteristics across the matched sample and the full ER sample are discussed in the text.

Appendix Table 1: Definition of Selected Establishment-Level Variables, 2009 and 2013

| Variables   |                                       |                              | Definition   |
|---|---------------------------------------|------------------------------|--|
| Performance:  | 2009                                  | 2013                         |  |
| Economic (financial) situation: management view               | MM500                                 | KFINAN                       | 1 to 5 scale: 1 is the lowest level. The variable indicates the economic (financial) situation in 2009 (2013).   |
| Relative labor productivity: management view                  | MM501                                 |                              | 1 to 4 scale: 1 is the lowest level. Labor productivity in the establishment is compared with other establishments in the same sector of activity. Only available in 2009.   |
| Trust:  |                                       |                              |  |
| Management trust: management view                             | MM702_1                               | er15e                        | 1 to 5 scale: 1 is the lowest level. In 2009, it is extracted from the question on whether “The <i>employee representation</i> helps us to find ways to improve workplace performance”; in 2013, it is based on the question “The <i>employee representation</i> can be trusted?” The latter is only available in 2013.  |
| Employee (representative) trust: workers’ representative view | ER151_3                               | q42a_c                       | 1 to 5 scale: 1 is the lowest level. In 2009, it is based on the question “The relationship between management and employee representation can best described as hostile”; in 2013, it is based on the question “Management can be trusted.” The latter is only available in 2013.   |
| Management-employee dissonance:                               | MM701 (climate) and ER151_3 (hostile) | KCLIMATE and q20_c (hostile) | Management-employee dissonance is based on the views of management and employee representative on the general work climate at the establishment. Their opinions are, respectively, coded as 1/0 dummies as follows:<br>(IR_quality_MM): 1 if the general work climate in the establishment is very good or good;<br>(IR_quality_ER): 1 if the relationship between management and employee representation can best be described as hostile (disagree or strongly disagree).<br>IR_quality_MM is based on the raw variables MM701 and KCLIMATE in 2009 and 2013, respectively;<br>IR_quality_ER is based on the raw variables ER151_3 and q20_c in 2009 and 2013, respectively. |
| Dissonance_1  |                                       |                              | 1/0 dummy: 1 if IR_quality_MM = 1 and IR_quality_ER = 0  |
| Dissonance_2  |                                       |                              | 1/0 dummy: 1 if IR_quality_MM = 0 and IR_quality_ER = 1  |
| (Reference category)  |                                       |                              | 1/0 dummy: 1 if IR_quality_MM = 1 and IR_quality_ER = 1<br>All cases with IR_quality_MM = 0 and IR_quality_ER = 0 are discarded.   |
| Other selected characteristics:                               |                                       |                              |  |
| Workplace representation:                                     |                                       |                              |  |
| Prevalent union   |                                       |                              | 1/0 dummy: 1 if there is either a unique union agency at the workplace or where the union agency can be adjudged more influential than the corresponding works council agency where both entities are present.   |
| Prevalent works council                                       |                                       |                              | 1/0 dummy: 1 if there is either a unique works council agency at the workplace or where the works council agency can be adjudged more influential than the corresponding union agency where both entities are present.   |
| Union organization:   |                                       |                              |  |
| Union density   | ER107                                 | q4_rec                       | Union density at the establishment (in percent). Available only in establishments with a valid employee representative response.   |
| Collective agreement:   | MM451                                 | er12                         |  |
| No collective agreement                                       |                                       |                              | Individual agreement (i.e. no collective agreement)  |
| Company level   |                                       |                              | Company level agreement  |

|  |       |          |   |
|--|-------|----------|---|
| Higher than company level  |       |          | Higher than company level agreement   |
| Mixed level  |       |          | Mixed-level agreement (i.e. company level and higher than company level).   |
| Labor productivity growth  | MM502 | KLABPRCH | 1 to 4 scale: 1 is the lowest level. Establishment's current labor productivity is compared to the situation three years earlier. In 2013, the variable is given for a 1-3 scale. |
| Workforce composition:   |       |          |   |
| Workers with an OEC  | N.A.  | q33perm  | Percentage of employees who have an open-ended contract (OEC). Only available in 2013.  |
| Female workers   | MM550 | q33wom   | Percentage of employees who are female  |
| Workers with a university degree   | MM553 | q33univ  | Percentage of employees who have a university degree in 2013; percentage of employees with a high-skill job in 2009.  |
| Part-time workers  | MM250 | q33pt    | Percentage of employees who work part-time (i.e. less than the usual full-time arrangement)   |
| Training:  |       |          |   |
| Paid on- and off-the-job training  | N.A.  | qh13     | Percentage of employees who in the past 12 months received paid time-off from their normal duties to undertake training, either off or on the job.                                |
| On-the-job training  | N.A.  | qh15     | Percentage of employees who in the past 12 months received on-the-job training.   |
| Performance-based pay:   |       |          | Performance-based pay variables are only available in 2013, with the exception of profit sharing which is also available in 2009.   |
| Payment by results   | ER350 | HVPBRES  | 1/0 dummy: 1 if payment by results, for example piece rates, provisions, brokerages or commissions  |
| Extra pay linked to the individual performance                                 | N.A.  | HVPINPER | 1/0 dummy: 1 if variable extra pay linked to the individual performance following management appraisal  |
| Extra pay linked to the performance of the group                               | N.A.  | HVPGRPE  | 1/0 dummy: 1 if extra pay linked to the performance of the team, working group or department  |
| Extra pay linked to the results of the company or establishment/profit sharing | MM460 | HVPPRSH  | 1/0 dummy: 1 if variable extra pay linked to the results of the company or establishment/profit sharing scheme.   |
| Extra pay in form of share ownership scheme                                    | N.A.  | HVPSHOW  | 1/0 dummy: 1 if variable extra pay in form of share ownership scheme offered by the company.  |



|  |                           |          |  |
|--|---------------------------|----------|--|
| Changes in organization:                                     |                           |          |  |
| Changes in the remuneration system                           | MM602_1                   | EOA_A    | 1/0 dummy: 1 if major changes in the remuneration system were introduced in the past three years. In 2013 the variable is defined simply as 'changes' in the remuneration system   |
| Changes in the work process                                  | MM602_3                   | EOA_B    | 1/0 dummy: 1 if changes in the organization of the work process were introduced in the past three years. In 2013 the variable is defined as changes in 'ways to coordinate and allocate the work to employees'   |
| Changes in the working time                                  | MM602_3                   | EOA_C    | 1/0 dummy: 1 if changes in the working time arrangements were introduced in the past three years   |
| Restructuring measures                                       | MM602_4                   | EOA_D    | 1/0 dummy: 1 if restructuring measures were introduced in the past three years. In 2013 the variable is defined as changes in the 'use of technology'  |
| Changes in recruitment policies                              | N.A.                      | EOA_E    | 1/0 dummy: 1 if changes in recruitment policies. This variable is not available in 2009  |
| (Excluded) instruments:                                      |                           |          |  |
| Single establishment   | MM100                     | ASINGLE  | 1/0 dummy: 1 if single independent company or organization   |
| Public services/public sector                                | MM104                     | APRIVATE | 1/0 dummy: 1 if establishment belongs to the public services sector. Note that this includes private and public schools and private and public hospitals, for example. In 2013, a public sector organization is defined as either wholly owned by the public authorities or they own more than 50%.  |
| (Excluded) instruments:                                      |                           |          |  |
| Strike incidence   | ER260<br>ER261a<br>ER261b | q46      | 1/0 dummy: 1 if there has been a stoppage or strike in the establishment in the last 12 months   |
| Influence of employee representation on management decisions | ER207_8                   | q38      | 1 to 5 scale: 1 is the lowest level. The variable indicates the influence of the formal employee representation body on management decisions. Specifically, in 2009, the management decisions pertain to career development (selection, appraisal, training), while for 2013 they include decisions in the following areas: organization of work processes; recruitment and dismissals; occupational health and safety; training and career development; working time arrangements; and restructuring measures |

*Notes:* The dataset also comprises eleven (ten) distinct sectors in 2009 (2013). The corresponding number of establishment size groups is six and three, respectively. Variable acronyms in the corresponding raw datasets are given in the second and third columns of the table.

Appendix Table 2: Establishment Performance and Alternative Employee-Management Dissonance Measures, 2009 and 2013, Marginal Effects

| Year | Variable      | Outcome<br>(establishment performance) | Outcome indicator (by increasing order) |                     |                      |                      |                      |
|------|---------------|--|---|---------------------|----------------------|----------------------|----------------------|
|      |               |  | 1                                       | 2                   | 3                    | 4                    | 5                    |
| 2009 | Dissonance_1  | Economic situation                     | .0034<br>(.0029)                        | .0104<br>(.0090)    | .0116<br>(.0101)     | -.0158<br>(.0137)    | -.0096<br>(.0084)    |
|      | Dissonance_2  |  | .0087***<br>(.0024)                     | .0267***<br>(.0068) | .0300***<br>(.0078)  | -.0407***<br>(.0102) | -.0248***<br>(.0065) |
|      | Works council |  | .0003<br>(.0032)                        | .0010<br>(.0099)    | .0011<br>(.0112)     | -.0016<br>(.0152)    | -.0009<br>(.0092)    |
| 2013 | Dissonance_1  | Financial situation                    | .0048**<br>(.0021)                      | .0185**<br>(.0075)  | .0447**<br>(.0177)   | -.0310**<br>(.0128)  | -.0371**<br>(.0149)  |
|      | Dissonance_2  |  | .0197***<br>(.0039)                     | .0747***<br>(.0090) | .1802***<br>(.0148)  | -.1250***<br>(.0177) | -.1497***<br>(.0167) |
|      | Works council |  | -.0024<br>(.0017)                       | -.0092<br>(.0065)   | -.0222<br>(.0157)    | .0154<br>(.0110)     | .0184<br>(.0132)     |
| 2009 | Dissonance_1  | Relative labor productivity            | .0063***<br>(.0023)                     | .0608***<br>(.0212) | -.0336***<br>(.0118) | -.0335***<br>(.0119) |                      |
|      | Dissonance_2  |  | .0074***<br>(.0018)                     | .0716***<br>(.0159) | -.0395***<br>(.0090) | -.0394***<br>(.0091) |                      |
|      | Works council |  | -.0007<br>(.0023)                       | -.0074<br>(.0225)   | .0041<br>(.0124)     | .0040<br>(.0124)     |                      |

Notes: See notes to Tables 7. Dissonance\_1 and Dissonance\_2 are based on raw variables MM702\_1 and ER151\_3 (for 2009) and KCLIMATE and q42a\_c (for 2013); see Appendix Table 1 for definition of management-employee dissonance. The number of observations in the first, second, and third main rows is 4,181, 2,157, and 4,017, respectively. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels, respectively; standard errors are given in parentheses.