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**Examining the Relationship between employee indicators of
resistance to changes in job conditions and Wider Organisational
Change: Evidence from Ireland**

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Abstract:

This paper uses a linked employer-employee dataset, the National Employment Survey, to examine the determinants of organisational change and employee resistance to change and, specifically, to examine the influence of employee inflexibility on the implementation of firm-level policies aimed at increasing competitiveness and workforce flexibility. Key finding arising from the research is that while workforce resistance to job-related change often forces firms to seek alternative means of achieving labour flexibility, there appears little that firms can do to prevent such resistance occurring. The presence of HRM staff, consultation procedures, wage bargaining mechanisms, bullying and equality policies etc were found to have little impact on the incidence of workforce resistance to changes in job conditions.

Background and Introduction

Within an increasingly challenging economic environment, firms - both domestic and foreign-owned - struggle to maintain competitiveness, particularly given that wages remain downwardly rigid even in times of economic stress (Babecky *et al.*, 2009, 2010; 2012; Bertola *et al.*, 2010; Christopoulou *et al.*, 2010; Autor and Katz, 1999; Fuss, 2008). The majority of the research has found that wage levels generally exhibit downward rigidity, with the probability of wage cuts being lower the more skilled the worker. Downward wage rigidity is also consistent with a number of theoretical labour market models such as the efficiency wage theory (Shapiro and Stiglitz, 1984), adverse selection theory (Weiss, 1980) and insider-outsider theory (Lindbeck and Snower, 1988). Given the inflexibility of earnings, it stands to reason that firms tend to seek to improve competitiveness primarily through other forms of organisational change. Pfeffer (1994) notes that, with a decreasing competitive advantage provided by traditional sources of success such as product and process technology, how the workforce is managed is comparatively more important. The ability of firms to implement organisational change will undoubtedly be impacted by the extent of co-operation of the workforce which, itself, may be a function of many factors such as the nature and scale of HRM practices, bargaining arrangements and industrial sector etc.

The link between workforce resistance and organisational change is under-researched perhaps due to a lack of available data that allows for a linking of employee sentiment to firm-level management strategies. This paper utilises data from a matched employer-employee survey captured at the beginning of the Irish downturn in October 2008. The study captures activity at the very beginning of the economic crises, when the decline in output was still relatively modest and the scale of the recession to come remained largely unforeseen. Given this, the

analysis relates to a relatively normal period of activity with respect to both worker and employee expectations and is likely to have continued relevance in the current economic climate where, on the whole, the overall degree and structure of employment are rapidly returning to pre-recession levels.

The research provides a unique assessment of the determinants of firm-level organisational change over a range of dimensions related to employee performance and, more importantly, measures the extent to which such change is impeded or stimulated as a consequence of levels of workforce resistance. It is important to note that worker resistance is difficult to measure as actual acts of resistance are rarely captured in datasets. Within this paper workforce resistance is proxied by a number of subjective responses to expected resistance to change in areas related to employee terms and conditions. We operate on the reasonable assumption that such a measure of expected resistance to change, averaged across all workers in the firm, will be correlated with past levels of actual resistance to changes and will also be a strong predictor of future worker resistance. In support of this, Choi (2011) demonstrates that change-specific commitments, such as commitment to change and cynicism about organisational change, are better predictors of either support for change or resistance to it than general attitudes, such as organisational commitment and organisational cynicism. Choi (2011) concludes that, given their propensity to evolve according to the situation, attitudes to change are better conceptualised as states rather than personality traits. Nevertheless, while individual attitudes to resistance might be somewhat fluent over time Choi (2011), we would contend that average attitudes to change within an organisation will tend to be much more static and will, therefore, exert a relatively consistent influence over employer decisions regarding organisational change.

There is a relatively limited empirical literature that explicitly measures the relationship between workforce resistance and organisational change. Dow and Perotti (2008) develop a theoretical construct of resistance to change by attempting to explain why established firms fail to adjust to take advantage of opportunities when new firms typically succeed. Dow and Perotti (2008) argues that radical adjustment of assets within the firm can create winners and losers and, consequently, employees whose skills are less valued as a result of proposed changes will tend to resist. The paper predicts modest shifts in the role of different skills can be implemented by consensus but that the likelihood of success diminishes as the desired shift gets larger.

A number of studies have sought to identify the determinants of resistance to change, some of which also link workforce resistance with employee level performance. Kotter and Schlesinger (2008) list the four reasons for resistance as the desire not to lose something of value, a misunderstanding of change and its implications, a belief that the change does not make sense for the organisation, and a low tolerance for change. The paper also recommends choosing a strategy for change based on the motivation and situational reasons. Iverson (1996), tests a causal model predicting employees' acceptance of organisational change in a public hospital in Australia. Using multiple regression techniques, Iverson (1996) finds that the most important determinant of acceptance to organisational change is union membership, with members less accepting than non-members. Oreg (2003) developed a measurement scale relating individual worker characteristics to resistance to change across and identifies four reliable factors: routine seeking, emotional reaction to imposed change, cognitive rigidity and short-term focus. Kunze et al (2013) interrogate the assumption of a correlation between age and resistance to change using the scale developed

by Oreg (2003). The findings of Kunze et al (2013) contradict the common stereotype of older employees being more resistant to change, with the authors suggesting this may be due to older employees being more stable and better able to cope with negative emotional reactions to change. The study also finds tenure and occupational status have positive coefficients for resistance to change, while the examination of how resistance to change interacts with individual performance finds individual resistance to change has negative consequences for workers, such as lower efficiency, higher absenteeism due to health problems and the emergence of fewer new ideas. Wanberg and Banas (2000) find that while the characteristic of resilience is not predictive of a more positive view of a given change, it is related to higher levels of change acceptance.

Finally, a number of papers examine the impact of organisational change on workers, thus providing some further understanding of the motivation for resistance. Tabvuma et al (2014) examine the public sector and measure how changes in political leadership - an exogenous organisational shock to a public sector organisation - affect employees. The paper also considers what happens when the political preference of the worker matches the election outcome and suggests the adverse effects of organisational change are stronger for women. However, the paper's relevance here is limited given its exclusive focus on the public sector. Black et al (2004) find that firms that implement high-performance practices compensate at least some of their workers for such work practices but that there is a significant association between the implementation of high-performance practices and increased wage inequality. Secondly, Black et al (2004) find that some forms of organisational change, such as self-managed teams and job rotation, tend to reduce employment levels within the firm. Bryson et al (2013) use a linked employee-employer dataset to study the effects of organisational change on employee well-being in the private sector. The paper finds that change can be introduced without adversely affecting the employee's job-related anxiety by engaging with

employees when implementing change, but only where one or more unions operate in the workplace. In the absence of a trade-union presence Bryson et al (2013) find that organisational change always increases job-related anxiety.

Data and Methods

The objectives of this paper are two-fold: firstly, we model the determinants of a measure of workforce resistance to job-related change and, secondly, we assess the impact of workforce resistance on the probability that firms will implement various wider forms of organisational change. The data is taken from the October 2008 National Employment Survey (NES) and captures the very beginning of the Irish economic recession, when the need for organisational restructuring was likely to be above average. The NES is a linked employee-employer survey that is nationally representative of the distribution of employers in Ireland. The employer sample is drawn from the CSO's Central Business Register. Selected firms are asked to extract a systematic sample of employees from payrolls. The 2006 NES survey is the last for which the CSO has produced a standard report on methods and quality. In that year, the response rate was 50% for the employer questionnaire and 75% for the employee questionnaire. The dataset covers 10,000 employers and 100,000 employees and the sample generated is representative of the proportion of companies in each economic sector and size class. The employer questionnaire requested information on employee earnings, hours worked and occupation. Information was also obtained on firm size, sector, the use of pay agreements, HRM procedures etc. Employees were issued with a separate questionnaire within which they provided information on age, gender, educational attainment, employment status (part-time or full-time), length of time in paid employment, length of service with current employer and also other job-related characteristics (for example, trade union membership, shift-work etc).

The October 2008 survey includes modules on employee resistance and organisational change, with separate employer and employee questions. Employers were asked “Has your business experienced any of the following forms of change in 2008?” with the respondent then providing dichotomous response to nine suggestions: (1) a greater reliance on temporary workers, (2) a greater reliance on part-time workers, (3) an increase in overtime hours, (4) a reduction in the number of management levels, (5) a greater reliance on job-rotation and multi-tasking, (6) a greater reliance on external suppliers of products/services (outsourcing), (7) a downsizing the operation, (8) an increases in the level of staff absenteeism, and (9) increases in the level of involuntary staff turnover¹. With respect to employee resistance to job-related change, employees were asked “If the following changes were implemented in your workplace over the next two years, how acceptable would you find: (1) an increase in your level of responsibility for your workload, (2) an increase in the level of technology involved in your work, (3) an increase in the level of supervision of your work, (4) an increase in the level of skills necessary to carry out your job, (5) having to work more unsociable hours, (7) an increase in your authority to make decisions, (8) changes to terms and conditions of your employment. In response, employees had the options of ‘acceptable’, ‘not acceptable’ and no response. A response of unacceptable is taken as an indication that the worker would oppose, or resist, the implementation of a specific alteration to their employment conditions. Given our measures, the central goals of this paper are, therefore, to (a) model the determinants of perceived workforce resistance to change and (b) measure the extent to which the general level of resistance to change amongst the workforce influences

¹ As changes in the levels of absenteeism and staff turnover are not determined by management, these are not subsequently included as measures of organisational change. Similarly, down-sizing is not considered as this may also be an exogenous influence largely outside of management control.

actual managerial decisions in related domains.

Given the papers objectives, we reduce our linked employer-employee data to the level of the firm by retaining one observation per organisation. In doing so, our employee resistance terms now relate to the average level of perceived resistance within the employing organisation. We retain information from the employer survey and derive a range of organisational average variables based on the employee responses within each organisation. We apply establishment-level weights to our firm-level observations to ensure that our data is representative of the population of firms in Ireland during 2008. Our sample is restricted to private sector organisations only on the grounds that public sector organisations are more insulated from market forces and thus both employees and managers are likely to behave differently both in terms of resistance to change and the need for organisational reform. After exclusions for missing data etc, we retain an effective sample of 4,035 firms.

Moving onto the econometric analysis, our specifications are based around the assumption that our key outcome variables (workforce resistance and organisational change) at the level of the firm will be driven by a combination of the human capital characteristics of the workforce and a range of organisational attributes. Given this, we begin by estimating equation 1 where the dependant variable is binary in nature and indicates that the firm has a incidence of workforce resistance to change in specific areas of job performance that places it in the top quartile of resistant firms. The choice of the cut-off point is somewhat arbitrary -- nevertheless, it is fair to conclude that firms selected in this manner can be classified as having the most resistant workforces. Equation 1 is estimated for each of the 7 job-related areas of potential reform. Resistance is modelled as a function of the firm-level characteristics, measured either in terms of variables derived from average employee

responses (H), which typically reflect the firm's human capital such as average levels of education and experience, or single response measures (F) taken from the employer survey which capture firm-level characteristics such as firm size, sector, HRM practices etc. Subsequent to identifying the drivers of employee level resistance, we then estimate equation 2, which models the determinants of firm-level organisational change as a function of firm-level characteristics (H and F). A key objective of the study is to assess the impact of worker resistance on organisational change, nevertheless, organisational change may be non-random with respect to employee resistance i.e. firms that have resistant workforces may also have a higher incidence of certain observable characteristics that predispose them towards certain forms of organisational change. The presence of such non-random selection will generate biased estimates of the impact of treatment variables, i.e. the workforce resistance terms, using a standard parametric estimation approach. Given this, we estimate the impact of firm-level resistance on organisational change by employing a Propensity Score Matching (PSM) estimation framework (Rosenbaum and Rubin, 1983), which explicitly controls the effects of sample selection. PSM is a two-stage estimation procedure, in stage 1 the principal characteristics of firms exhibiting each form of workforce resistance are identified through a series of probit models identical to those estimated in equation 1. Resistant firms are then matched on the basis of their predicted probabilities, or propensity scores, with non-resistant firms holding similar characteristics and the rates of organisational change of the two groups are then compared. In essence, the technique matches and compares rates of organisational change across resistant and non-resistant firms with similar observable characteristics², thereby substantially reducing the impacts of selection bias. In terms of the matching technique adopted, we apply Nearest Neighbour with replacement.

² Matching on propensity scores has been shown to be generally equivalent to matching on observable characteristics (Rosenbaum and Rubin, 1983).

$$\overline{Res} = \alpha + \beta_1 \bar{H} + \beta_2 F + \varepsilon \quad (1)$$

$$Orgch = \alpha + \beta_1 \bar{H} + \beta_2 F + \varepsilon \quad (2)$$

Results

Table 1 reports the average proportions of employees stating that a specific change in employment conditions is unacceptable by industrial sector. There was a good deal of variation in the level of workforce resistance to change on the various dimensions of employment conditions, with between 3 and 47 per cent of workers indicating that they would resist any attempt to alter aspects of their employment (Table 1). At 3 per cent, workforce resistance was lowest with respect to proposed increases in the use of technology in the workplace. Resistance was highest to increases in unsociable hours, with 47 per cent of workers indicating they would find any change in this element of their employment conditions unacceptable. 27 percent of employees also indicated that they would strongly oppose any changes to their terms and conditions of employment. Workforce resistance was also relatively high with respect to the increased supervision of workers with 14 per cent of employees indicating that they would oppose any change in this dimension of their employment. Interestingly, less than 10 per cent of employees stated that they would strongly resist any increases in their existing workload.

There was some substantial variation in the extent of workforce resistance to altered employment conditions across sectors. Subjective resistance was somewhat higher than average in the Financial and Insurance & Information and Information & Communication industries, particularly with respect to potential changes to terms and conditions or increases

in levels of supervision and unsociable hours. Resistance levels were also above average in the Education and Health & Social Work industries with regard to proposed increases in workload, technology and unsociable hours. Conversely, workforce resistance to many dimensions of job-related change was lower than average within the Construction sector, perhaps reflecting a higher tolerance for harsher working conditions among construction workers. .

Table 2 cross-tabulates workforce resistance to changing job conditions by organisational size and demonstrates, very clearly, that workforce resistance across all dimensions of change is, on the whole, strongly and positively correlated with organisational size.

<Insert Table 1 around here>

<Insert Table 2 around here>

Table 3 presents the result from equation 1, i.e. the characteristics of the most resistant firms across a range of areas related to employment conditions. These models also form the basis for stage 1 of the PSM estimates. The dependant variable takes the value 1 if the proportion of employees indicating that they would find change in a particular area unacceptable lies above the 75th percentile, and zero otherwise³. As such, the models identify the characteristics of highly resistant firms. We estimate the model using a binary variable, as opposed to the continuous alternative, in order to facilitate the PSM approach; nevertheless, the results from a model estimated using continuous dependant variable are comparable to those presented in Table 3⁴. The explanatory variables in our model capture the education and experience composition of the firm, existing work practices, management/HRM structures and employee incentive schemes. The models are generally well specified with the

³ The exception relates to the variable capturing resistance to an increase in skill requirements. The distribution of this measure was highly skewed to the left and, consequently, the cut-off point was raised to above the 90th percentile in this case.

⁴ Results available from the authors.

models ranging in explanatory power, measured in terms of a pseudo R², from 0.132 for resistance to increased authority / autonomy to 0.047 for resistance to increased supervision.

A number of variables appear important with respect to most dimensions of workforce resistance, specifically; resistant firms tended to employ lower shares of educated workers and were also larger in terms of firm-size. Pay levels were found to be largely unimportant; however, workforce resistance to the introduction of new technologies was lower in higher paying firms. Firms with higher proportions of more experience -- typically older -- workers were more likely to experience workforce resistance to any increases in workloads or changes to terms and conditions.

Interestingly, both trade union density and the presence of collective bargaining arrangements were not consistently related to workforce resistance; nevertheless, some impacts were detected. In line with prior expectations, workforce resistance to proposed changes in terms and conditions was positively related to trade union density. The presence of collective wage bargaining arrangements was found to be positively correlated with workforce resistance to proposed changes involving increases in both the skill requirements of jobs and levels of supervisory responsibility. Employee consultation had little impact; however, the collection of worker suggestions was related to a 7 per cent reduction in the probability of workforce resistance to any proposed increases in workloads. The share of workers employed in HRM and the existence of management development procedures had minimal, or no, impact on workforce resistance. The presence of equality policies within the organisation tended to lower the probability of workforce resistance to increases in levels of supervisory responsibility; however, no further impacts were found with regard to bullying, health or grievance policies. Organisations implementing individual performance

management systems were somewhat less likely to have a workforce resistant to the introduction of new technologies into existing jobs; presumably as such resistance would tend lower the chances of promotion within such firms.

The presence of certain financial incentive schemes was found to have some impacts. The higher the proportion of employees in profit sharing schemes, the lower probability of workforce resistance across most dimensions of employment conditions. However, individual incentive schemes raised the likelihood of workforce resistance to any proposed changes in levels of supervision, terms and conditions of employment and skill requirements. The presence of group incentive schemes also exerted a positive impact with regard to resistance to any proposed increase in supervisory requirements. Presumably, if efforts are rewarded on a group basis, this reduces the incentive of individuals to take on supervisory duties. Finally, with respect to the Industrial sector, in line with the descriptive statistics, the probability of workforce resistance across most dimensions of change tended to be highest within the Information and communications industry. Thus, to conclude, while workforce resistance was found to be related to numerous aspects of organisational structure, incentives and staff composition, we found that the presence HRM structures and policies to be largely unimportant in this respect. As a robustness check, we re-estimated the models at the level of the individual using a multi-level (random intercepts) framework⁵ and the results of which are reported in Table A1. The multilevel results largely correspond to those of the firm level model and, crucially, again demonstrate that HRM structures and policies are largely unimportant with respect to worker resistance to change. In fact, in the limited cases where impacts are detected the coefficients are generally positive indicating that such initiatives may increase worker resistance”

⁵ The dependant variable is binary in nature and indicates that the respondent has indicated that any change in the particular dimension of their working conditions would be unacceptable.

<Insert Table 3 around here>

Turning to organisational change, we begin by measuring the incidence of various strategies implemented in the months preceding the survey according to firm size (Table 4). The introduction of job rotation schemes / multitasking was the most commonly implemented strategy, with approximately 40 per cent of firms adopting or expanding its use between January and September 2008. Over a third of firms also down-sized throughout the period. The frequency of both job rotation / multitasking and organisational downsizing would indicate that the impact of the forthcoming recession was beginning to be felt by substantial proportions of companies throughout 2008. Nevertheless, the fact that substantial increases in unemployment did not occur until 2009 suggests that the scale of change, at least with regard to organisational downsizing, was likely to have been relatively modest. The incidence of other forms of organisational change ranged from 6.1 per cent for the increased use of overtime to 16.1 per cent for the increased use of part-time workers. Generally speaking, the frequency of organisational change was positively related to firm-size; however, the increased use of part-time workers was more common within smaller firms, while the increased reliance on overtime was highest within medium sized organisations.

<Insert Table 4 around here>

In Table 5 we model the probability that firms will have implemented a range of strategies related to either the increased labour force flexibility or downsizing. The models were again generally well specified, with pseudo R^2 statistics ranging from 0.055 for the increased use of job rotation schemes / multitasking to 0.182 for reductions in management numbers. For brevity, we do not present the sectoral coefficients, however the main effects are discussed below. Although the models are well specified, there were few consistent impacts with respect to general firm-level characteristics. Nevertheless, some patterns were evident. With

the exception of the increased use of external suppliers, larger firms were more likely to have implemented all forms of organisation change. The earlier descriptive finding that increased use of part-time workers and overtime was higher in smaller and medium sized firms respectively (Table 4) were no longer evident within a multivariate framework that simultaneously controlled for a range of determining factors. Organisations employing higher shares of part-time and temporary workers were, unsurprisingly, more likely to have increased their reliance of part-time throughout the year. In a similar vein, the increased use of job rotation schemes / multitasking was higher in firms employing greater concentrations of shift workers. Average wage levels were generally unimportant, however, higher paying firms were more likely to have reduced the number of managers in the period leading to the survey. The share of shift workers was also positively related to reductions in management numbers and the increased use of overtime. Increases in overtime were also more common in male dominated firms during the observation period.

With respect to HRM and employee relations operations, a number of variables were important across a range of forms of organisational change. The most frequent influences related to the increased use of job rotation / multitasking, which was negatively related to management development programmes and positively correlated with individual development programmes and the presence of equality policies. Management development policies were positively related to management downsizing, suggesting that the central thrust of such initiatives is to facilitate a more streamlined management structure. Firms implementing individual worker development programs were more likely to increase the use of temporary workers and job rotations schemes / multitasking during 2008. While the presence of grievance policies were unrelated to organisation change, equality policies positively influenced the increased adoption of job rotation / multitasking schemes and reliance on external suppliers. Firms implementing bullying policies were more likely to

downsize management numbers in 2008, while the presence of health policies was positively correlated with the increased use of part-time workers.

Financial incentive schemes were generally unimportant with respect to organisational change; nevertheless, profit sharing reduced the probability of increases in part-time employment and managerial down-sizing, whilst company down-sizing was less likely in organisations operating employee share schemes. The increased use of overtime was more common in firms operating individual incentive schemes, which seems consistent with a management style focused around individual, as opposed to group, rewards. Finally, companies employing higher shares of migrant workers were less likely to have increased their reliance on part-time workers during the year, providing some evidence that some employers may treat migrants and part-time workers as substitutes.

Economic sector was an important determinant of organisational change across a number of dimensions⁶⁶. Firms in the Construction sector were more likely to have downsized and increased their use of external suppliers and temporary workers over the period. The increased use of external suppliers was also more evident in the Manufacturing and Information and Communication sectors, with the increased use of job rotation schemes / multitasking also more evident in Manufacturing. Sector was generally unimportant with respect to the increased use of overtime or part-time workers. Firms in the Accommodation, Real estate and Administrative sectors were more likely to have increased their use of temporary workers between January and October 2008.

<Insert Table 5 around here>

With regard to the impact of the workforce resistance terms on organisational change, the results from our PSM analysis are presented in Table 6. It is apparent that workforce

⁶⁶ Results available from the authors.

resistance to increases in workloads, supervisory responsibilities and to changes in terms and conditions positively impacted the likelihood of various forms of organisational change occurring in the period leading up to the survey. Firms with workforces resistant to increases in workload were more likely to have increased their use of part-time workers and job rotation / multitasking. The increased use of part-time workers was also related to resistance to increased levels of supervisory responsibilities among the workforce. The results support the hypothesis that the increased use of peripheral workers observed in many aspect of the economy is due, at least in part, to inflexibility among existing workers to take on additional roles and responsibilities. Firms employing the largest proportions of workers resistant to changes in terms and conditions were more likely to have increased their reliance on overtime and external suppliers over the period, indicating that the mechanisms by which firms adjust production to account for sporadic increases in product demand are likely to be quite distinct depending on the objectives of the existing workforce. Firms resistant to changes in terms and conditions were also likely to have reduced management numbers, which may be a consequence that in such firms it may be easier to make management redundant in the course of any rationalisation process. Alternatively, the observed management rationalisation result could reflect the fact that managers are generally less effective in firms resistant to changes in core terms and conditions.

We conducted some integrity checks to ensure that firms within the Treatment Group were, indeed, matched with Control Group counterparts holding similar characteristics i.e. that our data was balanced. In terms of the variables where a statistically significant difference existed between the Control and Treatment groups pre-matching, these were eradicated post matching. A second test to check that our Treatment Group was matched with the Control Group involves re-running the Stage 1 treatment model (i.e. the workforce resistance models from table 4) on a sample consisting of the treated and matched firms. On the basis that both

sets of firms should share all, or most, characteristics no differences should be apparent and the probit model should be at, or close to, statistical significance with the Pseudo R^2 statistic also close to zero. The Pseudo R^2 fell to zero and was statistically insignificant in each instance where a positive treatment effects was found. On the basis of our integrity checks, we are confident that the data on which the PSM estimates were derived was balanced.

However, the reliability of any PSM estimate is dependent upon the Conditional Independence Assumption (CIA) being met i.e., that selection to the treatment is based solely on observables within the dataset and that all variables that simultaneously impact both the treatment and outcome variable are also observed. As the process of assignment to the treatment (workforce resistance) will effectively be based around a combination of key workforce and employer characteristics such as the educational / experience profile of the workforce, industrial relations arrangements, HRM policies, firm size, sector etc, all of which are observed within our data, we are confident that the variables at hand sufficiently incorporate all key aspects of the allocation to the treatment. Nevertheless, despite the richness of our data, it is not possible to completely rule out the possibility that our estimates are unaffected by one or more unobserved effects that simultaneously influence both the treatment and outcome variables. While we cannot explicitly eliminate such influences, we can test the sensitivity of our estimated treatment effects to the presence of such hidden bias. We check our statistically significant PSM estimates for robustness to unobserved heterogeneity bias using the “mhbounds” procedure in Stata and begin with the assumption of zero bias i.e. $\Gamma = 1$. The intuition behind this procedure is that we test the extent to which our results remain reliable in the presence of an unobserved factor that increases (or decreases) the odds ratio (Γ) of being assigned to the treatment group. In this instance we are concerned by unobserved factors that simultaneously increase both the likelihood of allocation to the

treatment category and the estimated treatment effect, which is termed positive selection bias. The results indicate that the estimated impacts we observe as statistically significant in Table 5 will generally become unreliable in the presence of an unobserved factor that increases the odds ratio that a firm will be classified as being resistant in a particular area by 1.5. While such a shift in the odds ratio is substantial, it is not impossible that it could be achieved by the inclusion of additional omitted variables. Our sensitivity checks suggests that while we are confident that our data is rich and that our subsequent estimated treatment results are highly robust, we cannot rule out the possibility that the estimated impacts of worker resistant on organisational change not would not change in the presence of a key variable determining allocation to the various treatment groups that is currently missing from our data.

<Insert Table 6 around here>

Summary and conclusions

Workforce resistance to proposed changes in job conditions was found to be lower in organisations employing higher shares of educated workers and also in smaller firms. HRM and employee relations measures were found to have little impact on worker resistance to changing employment conditions, while trade union density was important with respect to alterations to core terms and conditions. The level of experience among the workforce and rates of pay was also of relatively little importance in explaining resistance to proposed changes in job conditions. Employee share schemes were found to lower workforce resistance across a range of job-related dimensions; however, the marginal impact of such initiatives on the probability of workforce resistance was low.

On the basis that average levels of future perceived resistance within organisations are likely

to be heavily correlated to actual acts of historical resistance, particularly as these tend to be organised collectively, we utilise our subjective measure to arrive at an assessment of the impacts of general workforce resistance to change on overall organisational change. Overall, we found that high levels of workforce resistance to proposed changes in a range of areas related to existing employment conditions tended to influence firms' decisions to implement change across a number of dimensions. Specifically, we found that organisations where employees were resistant to increases in existing workloads were more likely to increase their use of part-time workers and job rotation / multitasking schemes. Resistance to increased levels of supervision among existing workers was also positively related to a greater reliance on part-time staff. Firms were more likely to increase their reliance on overtime and external supplies and to downsize management numbers in situations where their workforce was resistant to changes in the terms and conditions of employment.

From a policy perspective, the key finding arising from the research is that while workforce resistance to job-related change often forces firms to seek alternative means of achieving flexibility, there appears little that firms can do to prevent such resistance occurring or mediating its impacts. The presence of HRM staff, consultation procedures, wage bargaining mechanisms, bullying and equality policies etc were found to have little impact on the incidence of workforce resistance to changes in job conditions.

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Table 1: Mean scores by sector

Sector	Mean to an increase in:						
	Workload	Technology	Supervision	Skills	Unsociable	Authority	Terms
Mining							
Manufacturing	9.52	2.93	16.65	5.80	47.71	4.82	32.55
Electricity							
Water & waste							
Construction	6.34	3.45	9.43	4.77	36.87	4.31	21.61
Wholesale / retail	8.61	3.35	13.46	5.86	47.76	4.19	26.80
Transport and storage	7.54	3.05	13.49	5.26	41.44	3.99	27.94
Accommodation	7.92	3.29	10.35	5.76	35.89	3.75	20.76
Information & comm.	8.42	1.47	20.14	5.11	56.67	2.21	30.24
Financial & insurance	7.46	1.26	16.72	5.92	61.58	3.18	37.72
Real estate	8.46	1.28	14.0	4.28	44.88	2.23	27.37
Professional, scientific	6.48	1.68	16.91	5.64	53.64	2.21	25.96
Administrative	8.35	4.61	13.85	5.89	40.44	3.92	25.06
Public							
Education	14.71	6.72	16.01	8.95	59.77	2.80	26.30
Health & social	12.43	5.19	13.47	6.39	53.75	5.63	28.78
Arts	10.93	3.33	15.27	6.48	47.15	3.67	31.11
Other	8.49	2.56	16.01	4.97	52.29	3.35	28.56
Average	8.50	3.15	13.99	5.68	46.6	3.96	27.18

Table 2: Mean resistance scores firm size

Size	Mean resistance to an increase in:						
	Workload	Technology	Supervision	Skills	Unsociable	Authority	Terms
1-50	7.73	3.14	12.61	5.41	44.33	3.83	23.74
50-500	10.53	3.11	17.85	6.20	53.12	4.24	37.04
500+	12.93	3.69	20.67	8.23	57.49	5.09	42.34
Average	8.50	3.15	13.99	5.68	46.6	3.96	27.18

Table 3: Determinants of organisational resistance 2008

VARIABLES	work load	technology	Supervise	Skills	Unsocial	Authority	Terms
Mean wage	0.009	-0.046**	0.029	-0.016	-0.018	-0.008	-0.037
Mean exper	0.004***	0.002*	0.002	0.001	-0.000	0.000	0.003**
% Male	-0.055	-0.023	-0.020	-0.049	-0.1***	-0.022	0.004
% Part-time	0.001	0.010	-0.015	-0.033	-0.08**	0.018	-0.041
% basic education	-0.153*	-0.112*	0.090	-0.144	0.069	-0.061	0.010
% Secondary education	-0.23***	-0.197***	0.047	-0.25***	0.014	-0.18***	-0.024
% Post-secondary	-0.189**	-0.154**	0.057	-0.23***	0.039	-0.17***	0.054
% Sub-degree	-0.25***	-0.182***	0.005	-0.25***	-0.040	-0.18***	0.017
% Third-level	-0.21***	-0.221***	0.041	-0.22***	0.066	-0.23***	-0.064
% Shift-workers	0.039	0.042*	0.110***	0.051	-0.060	0.078**	0.010
% Professional	-0.056	-0.024	-0.013	-0.040	0.007	-0.070*	0.000
Firm size	0.070***	0.030***	0.011	0.072***	0.016*	0.090***	0.032***
TU density	-0.000	0.000	0.001	0.000	0.001	0.000	0.001***
Collective bargaining	0.058	0.007	-0.008	0.081**	-0.031	0.072**	0.051
Consult on change	0.014	0.022	-0.004	0.003	0.018	-0.002	-0.016
Worker suggestions	-0.07***	-0.022	-0.008	-0.022	0.034	0.008	-0.010
HRM share	-0.000	-0.001	-0.001	-0.009	0.001	-0.076	0.039
Manage develop	-0.019	-0.025	0.006	-0.001	-0.04**	-0.003	0.053*
Team perform man	0.018	0.010	-0.005	-0.016	-0.011	0.008	-0.039
Indiv develop	0.001	-0.042***	0.030	-0.036*	-0.008	-0.023	0.025
% Migrants	-0.028	-0.006	-0.018	-0.061	-0.030	-0.040	-0.056
Grievance policy	-0.020	0.002	0.015	-0.004	0.036	0.001	-0.013
Health policy	-0.025	0.004	-0.044	0.033	0.028	0.022	0.037
Equality policy	-0.008	-0.023	-0.081**	-0.031	-0.043	-0.036	-0.018
Bullying policy	-0.001	-0.017	0.032	-0.001	0.017	0.007	0.020
Indiv incent scheme	-0.000	0.000	0.001**	0.001**	0.000	-0.000	0.001***
Group incent schem	0.001	-0.000	0.001**	-0.000	0.000	0.001*	0.001
Employee share schem	-0.001*	0.000	-0.001	-0.000	0.000	-0.001**	-0.000
Profit sharing	-0.001	-0.001**	-0.001**	-0.001**	0.000	-0.00***	-0.000
Sector⁷							
Manufacturing	0.330**	-0.073**	0.327**	-0.17***	0.134	0.128	-0.16***
Electricity	-0.069	-0.076**	-0.15***	0.009		0.189	-0.106
Water & waste	0.233	-0.094***	0.159	-0.18***	-0.009	0.119	-0.17***
Construction	0.286**	-0.066	0.238*	-0.25***	0.183	0.117	-0.201**
Wholesale / retail	0.317***	-0.078	0.298**	-0.21***	0.197*	0.159*	-0.187**
Transport and storage	0.190	-0.085***	0.239	-0.19***	-0.029	-0.011	-0.18***
Accommodation	0.257**	-0.095***	0.211	-0.20***	0.123	0.037	-0.18***
Information & comm	0.441***	-0.059	0.459***	-0.147**	0.354**	0.154	-0.145**
Financial & insur	0.295**	-0.085***	0.340**	-0.15***	0.269*	0.189	-0.138**
Real estate	0.426***	-0.092***	0.337**	-0.19***	0.270*	0.033	-0.128
Professional, scient	0.383***	-0.069*	0.500***	-0.159**	0.295**	0.231*	-0.152**

⁷ Nace rev. 2. Mining and quarrying represents the base case in all models.

Administrative	0.281**	-0.056	0.377**	-0.17***	0.184	0.101	-0.18***
Education	0.552***	0.025	0.498***	-0.104	0.319*	0.059	-0.131*
Health & social	0.437***	-0.039	0.364**	-0.16***	0.340**	0.302**	-0.130*
Arts	0.433***	-0.058	0.432***	-0.17***	0.218	0.080	-0.112
Other services	0.242*	-0.093***	0.477***	-0.19***	0.298**	-0.011	-0.106
Observations	4,926	4,926	4,926	4,926	4,918	4,926	4,926
Pseudo R ²	0.0617	0.0947	0.047	0.784	0.0570	0.1320	0.0506
Wald Statistic	207.5***	172.4***	144.7***	257.2***	144.7***	471.3***	123.6***

Table 4: Incidence of Organisational Change

	Temp work	PT work	Overtime	Manag	Job rotate	extern	Down size
Small	7.3	16.8	4.5	9.5	37.3	9.6	36.1
Medium	13.4	14.2	11.3	20.2	51.5	13.4	39.7
Large	17.6	13.8	9.4	28.2	52.4	17.1	43.1
Mean	8.9	16.1	6.1	12.2	40.8	10.7	37.1

Table 5: Determinants of organisational change

VARIABLES	(1) Tempers	(2) parters	(3) otime	(4) manage	(5) rotate	(6) extern	(7) dsize
Mean wage	-0.004	-0.008	-0.003	0.032**	0.050	0.004	0.035
Mean exper	-0.001	-0.001	-0.000	-0.000	-0.001	0.001	0.000
% Male	-0.014	-0.049	0.025**	-0.042*	-0.026	-0.018	-0.021
% Part-time	0.037**	0.135***	0.010	0.003	-0.021	-0.027	0.011
% basic education	-0.018	-0.138	-0.012	-0.136*	-0.037	-0.081	-0.037
% Secondary education	0.034	-0.041	0.010	-0.047	0.069	-0.050	-0.086
% Post-secondary	0.006	-0.152	-0.003	-0.100	0.058	-0.063	-0.159*
% Sub-degree	-0.034	-0.065	0.002	-0.014	0.088	-0.005	-0.019
% Third-level	0.020	-0.160	0.012	-0.051	-0.095	-0.104	-0.049
% Shift-workers	0.031	0.100**	0.023**	0.068**	0.152***	0.016	-0.044
% Professional	-0.004	0.038	0.005	0.028	-0.026	-0.020	0.096
Firm size	0.014***	0.024***	0.007***	0.023***	0.054***	0.008	0.034***
TU density	0.000	-0.000	0.000*	-0.000	-0.000	0.000	-0.001
Collective bargaining	0.001	-0.018	0.002	-0.018	-0.060	-0.019	-0.043
Consult on change	-0.005	-0.006	0.009	0.012	0.028	0.015	0.049*
Worker suggestions	0.014	-0.012	0.008	0.004	0.009	0.010	0.055*
HRM share	-0.003	-0.037	0.000	0.001	-0.001	-0.000	-0.026
Manage develop	-0.021	0.004	0.013	0.044***	-0.076**	-0.006	-0.012
Team perform man	0.014	0.035	-0.006	0.022	0.065*	-0.006	-0.039
Indiv develop	0.041***	0.016	0.001	0.016	0.105***	0.006	0.036
% Migrants	-0.032	-0.076**	0.006	-0.007	0.040	-0.022	0.004
Grievance policy	-0.005	-0.022	-0.006	0.019	0.047	0.007	-0.007
Health policy	-0.004	0.053**	0.012	0.011	0.021	-0.019	-0.015
Equality policy	-0.017	0.013	-0.001	-0.010	0.089***	0.033**	0.054
Bullying policy	0.023*	-0.011	-0.009	0.034**	-0.020	-0.032	0.022
Indiv incent scheme	0.000	-0.000	0.000**	-0.000	0.001	0.000	-0.001
Group incent schem	0.000	0.000	0.000	-0.000	0.001	-0.000	-0.000
Employee share scheme	0.000	-0.000	-0.000	0.000	-0.000	0.000	-0.003**
Profit sharing	-0.000*	-0.001**	-0.000	-0.001**	-0.001	0.000	0.000
Observations	4,918	4,918	4,918	4,926	4,926	4,918	4,926
	0.73	0.0914	0.081	0.182	0.079	0.055	0.130
Pseudo R2							
Wald Statistic	136.4***	226.6***	197.3***	292.5***	267.4***	117.1***	304.7***

*** p<0.01, ** p<0.05, * p<0.1

Table 6: PSM Estimates of the impact of worker resistance on organisational Change

	Temp work	Part-time	Overtime	Manage	Job Rotate	External	Downsize
Resist workload	0.025*	0.054***	0.001	0.012	0.063***	0.022	-0.025
Resist technology	0.032*	0.047*	0.01	-0.003	0.002	0.002	-0.051*
Resist supervision	0.019	0.042**	0.01	0.019	0.019	-0.006	-0.015
Resist skills	0.01	0.013	0.005	0.014	0.027	-0.01	-0.007
Resist unsociable	0.025*	0.02	-0.008	-0.009	-0.015	0.011	-0.025
Resist authority	0.009	0.023	0.015	-0.014	0.023	-0.005	-0.029
Resist terms	-0.016	0	0.031***	0.038**	0.025	0.035**	-0.013

Appendices

Data Appendix

Variable name	Description
Mean wage	average gross weekly wage paid to employees in firm
Mean exper	average years spent in employment by employees of firm
% Male	% share of employees in firm who are male
% Part-time	% share of employees in firm who are part-time
% basic education	% share of employees in firm who have a primary level education
% Secondary education	% share of employees in firm who have a secondary level education
% Post-secondary	% share of employees in firm who have a post-secondary level education
% Sub-degree	% share of employees in firm who have a sub-tertiary level education
% Third-level	% share of employees in firm who have a third level education
% Shift-workers	% share of employees in firm who are shift workers
% Professional	% share of employees in firm who belong to professional bodies
Firm size	number of employees in firm
TU density	% share of employees in firm who belong to a trade-union
Collective bargaining	Binary variable indicating that firm has a collection agreement with trade-unions
Consult on change	Binary variable indicating that firm has a sytem in place for consulting with employees
Worker suggestions	Binary variable indicating that firm has a employee suggestion scheme
HRM share	% share of employees in firm who work in HR
Manage develop	Binary variable indicating that firm has a system for developing management competency
Team perform man	Binary variable indicating that firm has a system of team-based performance management
Indiv develop	Binary variable indicating that firm has a system of individual performance management
% Migrants	% share of employees in firm who are immigrants
Grievance policy	Binary variable indicating that firm has a clearly specified grievance policy
Health policy	Binary variable indicating that firm has a clearly specified health policy
Equality policy	Binary variable indicating that firm has a clearly specified equality policy
Bullying polcy	Binary variable indicating that firm has a clearly specified bullying policy
Indiv incent scheme	% share of employees who participate in individual incentive schemes
Group incent scheme	% share of employees who participate in group incentive schemes
Employee share scheme	% share of employees who participate in share schemes
Profit sharing	% share of employees who participate in profit sharing schemes
Workforce resistance	
Resist workload	Binary variable: firm is in highest quartile for workforce resistance to increased workload
Resist technology	Binary variable: firm is in highest quartile for workforce resistance to increased technology
Resist supervision	Binary variable: firm is in highest quartile for workforce resistance to increased supervision
Resist skills	Binary variable: firm is in highest quartile for workforce resistance to increased skills
Resist unsociable	Binary variable: firm is in highest quartile for workforce resistance to unsociable hours
Resist authority	Binary variable: firm is in highest quartile for workforce resistance to increased autonomy
Resist terms	Binary variable: that firm is in highest quartile for workforce resistance to changes in terms

Organisational change

Temp workers	Binary variable indicating that firm increased its reliance on temporary workers
PT workers	Binary variable indicating that firm increased its reliance on part-time workers
Over time	Binary variable indicating that firm increased its reliance on overtime
Manage	Binary variable indicating that firm reduced management numbers
Rotate	Binary variable indicating that firm increased its reliance on job rotation / multitasking
Extern	Binary variable indicating that firm increased its reliance on external suppliers

Table A1: Multilevel (Random Intercepts) Model of Worker Resistance to Change

VARIABLES	Workload	Technology	Supervision	Skills	Unsocial	Authority	Terms
wage	-0.013***	-0.013***	0.004	-0.01***	-0.017***	-0.016***	0.017***
exper	0.001***	0.000	0.001***	0.000	0.002***	0.000	0.002***
Male	-0.013***	-0.005***	-0.007*	-0.02***	-0.093***	-0.006***	-0.02***
Part-time	0.010***	0.007***	0.009**	0.006**	-0.013**	0.010***	-0.03***
basic educ	-0.011*	-0.030***	0.010	-0.013**	0.070***	-0.029***	0.034***
% Secondary	-0.022***	-0.042***	0.018**	-0.02***	0.090***	-0.036***	0.042***
Post-second	-0.013**	-0.037***	0.018**	-0.02***	0.077***	-0.032***	0.045***
Sub-degree	-0.018***	-0.049***	0.029***	-0.03***	0.118***	-0.046***	0.058***
Third-level	-0.029***	-0.046***	0.035***	-0.04***	0.103***	-0.045***	0.005
tenure	0.001***	0.001***	-0.000	0.000	-0.002***	0.001***	0.000
Shift-work	-0.002***	-0.001***	-0.001***	-0.001**	0.004***	-0.002***	0.001*
prof	0.002***	-0.000	0.000	0.000	0.001	0.001***	0.005***
flexi	-0.003***	-0.001	-0.006***	-0.00***	-0.027***	-0.002***	-0.017***
union	0.053***	0.009***	0.037***	0.013***	0.061***	0.020***	0.128***
migrant	-0.003	0.009***	-0.013***	-0.01***	-0.115***	0.006**	-0.078***
Firm size	0.011***	0.002***	0.011***	0.005***	0.017***	0.002***	0.031***
Collective bargaining	0.008**	0.002	0.007*	0.000	-0.006	0.004*	0.009
Consult on change	-0.003	-0.003	-0.004	-0.002	0.010*	-0.001	0.003
Worker suggestions	0.003	-0.002	0.008**	0.004	0.026***	-0.002	0.005
HRM share	-0.000	-0.000	-0.000	-0.000	0.002*	-0.000	0.003***
Manage develop	-0.008**	-0.002	0.001	-0.002	-0.006	0.001	-0.002
Team perform	0.001	0.001	-0.010**	-0.003	-0.006	0.000	-0.006
Indiv develop	0.003	0.002	0.010**	0.002	0.019***	-0.001	0.025***
Grievance policy	0.001	-0.001	0.015**	0.001	0.040***	0.001	0.023***
Health policy	0.004	0.003	-0.006	0.002	0.012	0.004	0.004
Equality policy	-0.002	-0.000	-0.014**	-0.006	-0.027***	-0.004	-0.013*
Bullying policy	0.000	-0.002	0.002	0.003	-0.007	0.001	-0.000
Indiv incent scheme	-0.000	-0.000	0.000***	0.000	0.000***	-0.000	0.000***
Group incent schem	0.000***	0.000	0.000*	-0.000	0.001***	0.000	0.000***
Employee share schem	-0.000*	-0.000	0.001***	0.000	0.000***	-0.000	0.000
Profit sharing	-0.000	-0.000***	-0.000	-0.000**	0.000	-0.000**	-0.000
Observations	53,536	53,536	53,536	53,536	53,536	53,536	53,536
R-squared	0.027	0.015	0.019	0.009	0.060	0.016	0.074