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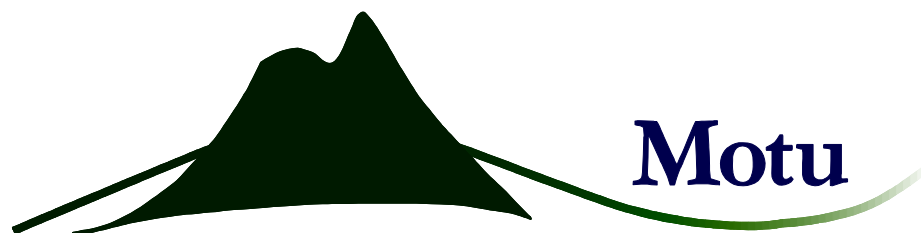
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Performance Pay Systems and the Gender Wage Gap

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**Motu Working Paper 12-13
Motu Economic and Public Policy Research**

December 2012

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Acknowledgements

This research was prepared with funding from the Ministry of Women's Affairs. The authors wish to thank the Ministry for their support, Statistics New Zealand for access to the data, and Angela Yeoman and Ron Crawford for feedback on the project.

Disclaimer

This paper was undertaken while the authors were on secondment to Statistics New Zealand. The results in this paper are not official statistics, they have been created for research purposes from the Integrated Data Infrastructure prototype (IDI) managed by Statistics NZ. The opinions, findings, recommendations and conclusions expressed in this paper are those of the authors. Statistics NZ, the Ministry of Women's Affairs, Motu, the University of Auckland, and the University of Waikato take no responsibility for any omissions or errors in the information contained here.

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Careful consideration has been given to the privacy, security and confidentiality issues associated with using administrative data in the IDI. Further detail can be found in the Privacy Impact Assessment for the IDI available from www.stats.govt.nz.

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Abstract

We examine the relationship between performance pay systems and wages, paying particular attention to gender differences in outcomes. At the firm level, estimates suggest average wages are unaffected by changes in performance pay practices, but that the within-firm distribution of wages is stretched. This latter result is explained by worker-level regressions, showing that male workers with initially higher expected wages are more likely to benefit from increased use of performance pay in the firm. Given the apparent absence of such an effect on female wages and the concentration of prime-age men in the top quartile of the wage distribution, women, on average, benefit less from the operation of performance pay systems.

JEL codes

D21, J31, O31

Keywords

Human resource management; personnel economics; gender wage gap; performance pay

1 Motivation

The gender wage gap is an important and intensely studied topic in labour economics. Across countries and over time, women’s average wages are invariably found to be lower than men’s even after controlling for differences in observable characteristics such as education, work experience and occupation. Weichselbaumer and Winter-Ebmer (2005), in their meta-analysis of 263 articles providing estimates from 67 countries, show that, while the component of the raw gender wage gap attributable to differences in observable characteristics has declined substantially over time, the unexplained component of the wage gap has been static.¹ Recent research has emphasised that the wage gap is often larger at the top end of the wage distribution – the “glass ceiling” effect (eg, Arulampalam et al. 2007).

This paper follows a less developed strand of the gender wage gap literature, investigating whether the adoption of modern human resource management (HRM) practices exacerbates the gender wage gap. Overall, the academic literature points to a strong positive link between adoption of high-performance work practices, better firm performance and higher average wages for workers. Lazear and Shaw (2007) and Pfeffer (2007) provide recent reviews of the field.

Fabling and Grimes (2009) examine the effect of New Zealand firms adopting modern HRM practices. They find that improvements in performance management systems (performance pay and performance reviews) raise average wages within firms. If this effect is heterogeneous across workers, these practices could affect the relative earnings of men and women in New Zealand. Further, the magnitude of any impact may vary across different points in the wage distribution. In the US at least, it is believed that the general widening of the earnings distribution is, among other things, “...likely to reflect changes in human resources practices” (Lazear and Shaw 2007).

The application of performance pay systems at a firm could impact the within-firm distribution of wages because not all jobs are equally suitable candidates for performance pay. In particular, performance pay systems may be more appropriate for jobs where effort or output is more easily measure-

¹Dixon (2004) provides empirical evidence of the earnings gap between men and women in New Zealand.

able (Gibbons 1998). Additionally, this differential application may affect the gender wage gap because of gender sorting into occupations with different incidence rates of, or benefits from, performance pay systems. For example, Brown (1990) using US data, shows that the incidence of various incentive-based pay methods differs systematically with the proportion of women employed in the firm.²

An alternative set of hypotheses is provided by models of discrimination, where managers exercise preferences for workers with particular characteristics by offering below market wages to workers without favoured attributes (Becker 1971).³ In this situation, the introduction of formal performance management systems might lead to increased transparency of discriminatory practices (eg, through formal performance reviews), leading to a compression of a gender wage gap caused by taste-based discrimination. On the other hand, performance payments might provide a mechanism for increased discrimination, particularly if individual performance is hard to observe or quantify.

Using detailed linked employer-employee data we first establish that performance pay systems increase within-firm wage dispersion. To the best of our knowledge, this is the first study to use longitudinal data on firm-level performance pay practices linked to comprehensive administrative Linked Employer-Employee Data (LEED).⁴ The panel nature of the data enables difference-in-difference estimation to identify parameters of interest. We also

²Using German data, Heywood and Jirjahn (2002) similarly find that men and women sort into different variable payment schemes.

³In the presence of such behaviour, firms would be expected to have below average profitability, potentially affecting market survival. However sub-normal profits might be tolerated by an owner-operator who is directly benefiting from working with a certain type of worker. In arms-length relationships, it may be difficult for owners to monitor the activities of managers, so that sub-normal profits are not attributable to particular managerial practices.

⁴Gupta and Eriksson (2006) examine the role of workplace practices on the gender wage gap using LEED data with a one-off survey of business practices relying on respondent recall to identify the year when business practices change. de la Rica et al. (2010) use a cross-section of workers where performance payments are separately identifiable, relying on the payment of such bonuses to identify workers on performance pay. Drolet (2002) using a two-stage worker-firm sample survey to show, in cross-section, a relationship between performance pay and the gender pay gap. Bauer and Bender (2001) link a survey on high performance work practices to German LEED data, but focus on the role of flexible workplace systems on wages.

control for other general management practices, the presence of collective bargaining, and the mix of part-time and blue-white collar workers at the firm. These controls reduce the potential for selection bias, providing a tighter test of a causal relationship from performance pay systems to workers' wages.

At the worker level, we estimate a wage equation allowing us to classify workers into quartiles of an expected wage distribution. The wage equation confirms the existence of a substantial gender wage gap, controlling for age, tenure and industry. Examining the impact of performance pay at different points of the wage distribution suggests two empirical regularities – that positive benefits are concentrated in the top quarter of the wage distribution, and that these effects are present only for men. The heterogeneity of effects across gender, combined with the lower representation of women in the top quartile of the wage distribution, likely exacerbate the observed glass ceiling. These findings are akin to Lemieux et al. (2009) and Heywood and Parent (2012) who find, respectively, that performance pay effects are concentrated at the top end of the pay distribution in the United States, and that the wider white-black wage gap at the top is driven completely by workers on performance pay.

If the gender difference in the effect of performance pay on wages is partly due to discrimination, then we might expect the presence of women at top management levels of the firm to lead to better relative outcomes for female workers (eg, Cardoso and Winter-Ebmer 2010; Kurtulus and Tomaskovic-Devey 2012). We investigate the possible role of management gender bias by isolating the effect of performance pay systems according to the gender of the top-paid worker in the firm, finding that the same asymmetric outcomes for men and women are observed in both male- and female-led firms.

Section 2 outlines the specifics of the dataset, while section 3 summarises our findings. Section 4 concludes.

2 Data

We make use of two components of Statistics New Zealand's Integrated Data Infrastructure prototype – the prototype Longitudinal Business Database

(LBD) and the Linked Employer-Employee Data (LEED).⁵ From the LBD, we extract information on management practices, collective bargaining, and occupational work groups from the 2005 and 2009 Business Operations Surveys (BOS), together with industry classification from the Longitudinal Business Frame. From LEED, we extract monthly PAYE records, gender and birth date information for all individuals paid a wage by BOS firms over the 2005 and 2009 years.⁶ We then exclude wage-earners who are also owners of the firm and calculate an annual average full-time equivalent (FTE)-adjusted real log wage for each employee (following Maré and Hyslop 2007).⁷ At the firm-level, the dependent variables of interest are average log wage and the coefficient of variation of log wages (ie, the standard deviation over the mean of $\ln(w)$, multiplied by 100 for ease of reporting regression coefficients) – the latter being a summary measure of within-firm wage dispersion.

In firm and worker level regressions we control for the log of firm-level total employment, employee tenure, and the age-gender profile. Worker tenure is calculated as the number of years since the worker was first employed in one of the firms' plants.⁸ At the firm level, employment shares of workers by annual tenure levels are included, whereas at the worker-level a quartic function of actual tenure is included in regressions. Employee age is calculated as at September in each year. For firm-level regressions, workers are divided into three age groups: young (< 30), prime-aged (30-50), and old (> 50), chosen to reflect the general cross-sectional pattern of increasing, static, and then declining wages by age for these three groups respectively. For worker-level regressions a quartic relationship is estimated between age and wages, where the continuous age variable is restricted to the range 18-65,⁹ with young and old dummies entered separately for censored observations.

The BOS is an annual sample survey of private sector firms with six or more employees, used to produce official statistics on innovation, ICT use,

⁵We use the September 2011 LBD archive together with the LEED snapshot consistent with that version of the LBD (ie, the August 2010 LEED archive).

⁶We use March year-ends (ie April 2004-March 2005 and April 2008-March 2009) as this is the dominant balance date for respondent firms.

⁷All results in the paper are FTE-weighted. FTE adjustment uses benefit payments, multiple job holdings and the minimum wage threshold to identify workers who are likely to be less than full-time employed. Wages are deflated by the quarterly Consumer Price Index.

⁸This measure is right-censored at five years since LEED starts in April 1999.

⁹The age variable entered into regressions is measured as actual age less 45 years, so that it varies over the range $[-27, 20]$.

and other business practices and outcomes. The sample design, combined with an intentional panel top-up, result in large panels of firms across any two survey years (Fabling 2009). The survey is mandatory and has over an 80 percent response rate in each year. Longitudinal business identifiers are constructed following Fabling (2011), and businesses are assigned to a permanent industry using predominant employment shares.¹⁰

Table 1 summarises sample sizes of both workers and firms.¹¹ For the purposes of our analysis, the important features of the data are the broad industry coverage, the size of the firm-level panel dataset (over 3,300 firms), and the large number of employees working in those firms (almost 300,000 in each year) with 166,000 of these maintaining employment in the same firm across the two time periods. Together, these factors allow us to identify parameters of interest with precision for a large section of the New Zealand economy.

The BOS contains over fifty consistently-measured questions on management practices covering topics such as strategic focus, customer and supplier interactions, benchmarking, process and quality management, and human resource management (HRM) practices.¹² Questions are posed with binary, Likert- or intensity-scale response categories, often including a “don’t know” response category.

Two HRM questions relate directly to performance pay systems:

1. Over the last financial year, what percentage of employees¹³ in this business had formal performance reviews?
2. Over the last financial year, what percentage of employees in this business are on “pay for performance” schemes (eg, productivity based

¹⁰The 1996 Australia-New Zealand Industry Classification (ANZSIC’96) is used at the two-digit level, with the exception of Mining (division B), Electricity, Gas & Water (division D), and Rail, Water & Other Transport (I62, I63, I65) which are one-digit groupings. A small number of observations, mainly in Personal and Other Services, are dropped to maintain a consistent industry coverage across the two surveys.

¹¹All counts are random-rounded in compliance with Statistics New Zealand confidentiality rules.

¹²Links to aggregate survey results and metadata can be found at http://www.statistics.govt.nz/browse_for_stats/businesses/business-growth-and-innovation/business-operations-survey-info-releases.aspx.

¹³Respondents are instructed to exclude contractors and working proprietors from the definition of employees, but to include managerial and executive staff, and part-time/casual employees.

incentives, profit sharing, bonuses, etc)?¹⁴

For each question, possible responses are 0; (0-15]; (15-30]; (30-50]; (50,99]; 100% or “don’t know.” We drop observations where respondents fail to answer, or answer “don’t know,” to either question.¹⁵ We then convert the performance review variable to a binary set equal to one if any performance reviews are conducted, and the performance pay response to a continuous variable such that

$$\text{performance pay} = \frac{1}{4} \times \begin{cases} 0 & \text{if response} = 0 \\ 1 & \text{if response} = (0 - 15] \\ 2 & \text{if response} = (15 - 30] \text{ or } (30 - 50] \\ 3 & \text{if response} = (50 - 99] \\ 4 & \text{if response} = 100 \end{cases}$$

These choices are motivated by considering differences in the average wages in firms with different reported intensities of each variable.¹⁶ We also include a binary interaction term between the two practices that is equal to one when the reported level of staff on performance reviews is lower than the proportion on performance pay (that is, when there must be at least some staff who receive performance pay when they do not have formal reviews). In subsequent regressions, the effect of performance pay is allowed to differ when this condition holds, and we estimate the main effect of having less coverage for reviews than for performance pay.

For other management questions in the survey, we associate “don’t know”

¹⁴Note that the definition of performance pay includes the use of share options, but that the wage measure we use (PAYE earnings) would not capture the issuance of these. This is not likely to be an issue in New Zealand, given the very limited number of publicly listed firms.

¹⁵We also drop observations who do not supply information on part-time and occupation employment shares.

¹⁶Specifically, we test the appropriate functional form for these variables by initially performing firm-level OLS regressions of average wages on a full set of response category dummies (with the full set of controls outlined in the following section). We then test equivalence of category coefficients, concluding that coefficients on the third and fourth categories of performance pay ((15-30] and (30-50]) are not different from each other, and that, conditional on having any performance reviews, average wages do not vary over different performance review intensities. After combining the third and fourth categories of performance pay, coefficients on these dummies increase systematically in the firm-level wage regression, leading us to adopt a parsimonious linear specification. Formal tests of the linear restriction are rejected at the one percent level.

responses and non-response with the lowest response category. We justify this treatment on the basis that non-response is a rare event.^{17,18} We then convert the scale responses into binary variables where we split each practice on the response category that produces the closest-to-equal employment-shares in the resulting high-low practice groups. As well as controlling for a broad range of management practices by including each binary variable as a control, we also allow for performance pay systems to be more effective in the presence of “good” general management practices. To define better-managed firms, we use principal components analysis of the binary business practices to construct a single index of management practices (based on the first principal component),¹⁹ which in turn is used to construct a “high other practices” binary for firms above the (FTE-weighted) median value of the index. These interaction terms are motivated by a number of studies emphasising the importance of utilising a suite of employee practices (Kochan and Osterman 1994; Milgrom and Roberts 1995; MacDuffie 1995; Ichniowski et al. 1997; Kandel and Lazear 1992; Kruse et al. 2003).²⁰

Table 2 provides employment-weighted summary statistics for these variables as well as the dependent variables. The average (FTE-adjusted) wage in the sample is roughly \$49,000 2009 dollars ($\simeq e^{10.8}$). Ninety-three percent of workers are employed in firms where some staff have formal performance reviews, and there are few firms who conduct fewer performance reviews than they have staff on performance pay. The FTE-weighted incidence of performance pay system variables is very similar for male and female workers, so these statistics are not reported.

¹⁷Conditional on answering the mandatory questions, the median (mean) respondent answers all (all but one) of the remaining management questions. The alternative approach of only retaining firms that answer all 55 questions would seriously reduce the sample size.

¹⁸The exception is the set of questions about training by skill type, which have high non-response rates and so are dropped. A question on overall training rates is retained, capturing the difference between firms with high and low aggregate levels of training.

¹⁹The resulting principal component does not have particularly high loadings on any subgroup of practices, and therefore does represent a broad measure of general management practices.

²⁰We interact the performance pay and performance review variables with the “high other practices” binary after removing each variables’ sample (FTE-weighted) mean, so that reported elasticities are evaluated at the mean of each of the performance pay system variables. The same approach is adopted for the interaction of performance pay with the “review less than pay” dummy.

Table 3 describes the incidence of performance pay systems in more detail, together with average weighted firm-level wages for each combination of practices. Around 20 percent of workers work in firms with no performance pay. Perhaps not surprisingly, relative to the overall population, these are also firms with disproportionately low incidence of formal performance reviews. Most firms with performance pay, do not offer such conditions to all of their workers, with the modal worker being in a firm with less than 15 percent of colleagues on performance pay. At the other end of the spectrum, 10 percent of workers are in firms where everybody is on performance pay, and these firms invariably have performance reviews as well.

Looking at the mean of average wages and the coefficient of variation by response category (the last four columns of table 3), we observe the two motivating factors for the choice of functional form for the performance pay system variables. First, at any given level of performance pay, wages and their dispersion are higher in firms with formal performance reviews. Second, focussing on (the over 90 percent of) employees in firms with performance reviews, there is a systematic increase in average wages and wage dispersion with the intensity of performance pay.

Patterns at the aggregate level (table 2) suggest that management practices are stable over time. Tables 4-6 examine changes in performance pay systems for firms reporting in both BOS surveys. Roughly half of employment (53 percent) is in firms that report the same intensity of performance pay over time (the main diagonal elements of table 4).²¹ For those businesses that change practices, the predominant shift is up or down one category (14 and 18 percent of employment, respectively). This leaves 15 percent of employment in firms making more radical changes to the coverage of performance pay. Overall, transitions are skewed towards declines in intensity, consistent with the aggregate statistics in table 2.

Because we collapse performance reviews to a binary variable, the measured change in practices is more limited, with around 3.5 percent of employment associated with firms transitioning in or out of having formal performance reviews (table 5). This compares directly with a 7-8 percent transition rate in and out of having any performance pay (first row and column of table 4).

²¹Since some of these groupings contain a broad range of actual intensities, substantial changes in the use of performance pay could still arise for firms reporting no change over time.

Table 6 reports the combined changes in both components of the performance pay system. The simple point to draw from this table is that there is a positive correlation between measured change in the two variables. That is, individual practice changes are coordinated in a way consistent with these practices being part of a management system with complementarities – a view reinforced by the scarcity of firms with fewer formal reviews than performance pay employees (table 2).

3 Results and interpretation

3.1 Firm-level regressions

We begin by examining the cross-sectional relationship (pooled over 2005 and 2009) between wages and performance pay systems at the firm level (tables 7-9). These regressions demonstrate the importance of our additional control variables and motivate the worker-level regressions by exploring the relationship between performance pay systems and the within-firm dispersion of wages, and by identifying workforce gender as a potential source of heterogeneous worker outcomes.

Table 7 shows the result of regressing the mean log wage on performance pay system variables with and without additional controls. Initially (column 1), we include only the performance pay system variables: performance pay, performance reviews, each of these interacted with the “high other practices” indicator, performance pay interacted with the binary variable indicating whether the firm matches reviews with pay, the review less than pay dummy, plus an unreported year dummy. In this specification, the cross-sectional relationship between performance pay intensity and average wages is strong (coefficient of 0.318). Other performance pay system variables are insignificantly different from zero. Overall this specification explains twelve percent of the variation in (firm-level) average wages.

The addition of industry dummies (column 2) and then other firm characteristics (column 3) shows the importance of these controls. Industry dummies raise the R^2 to 49 percent, while the inclusion of worker characteristics and the 55 other management practice variables raise the R^2 to 78 percent. At the same time, the coefficient on performance pay reduces (still significant

at the one percent level), implying that a firm with all staff on performance pay will have average wages roughly nine percent higher than firms without any performance pay at all. There is no compelling evidence for any other associations between performance pay system components and average wages.

The additional controls (table 7, column 3) have relationships consistent with expectations. The part-time staff share coefficient is negative indicating that part-time work is associated with lower wage jobs, and/or that the FTE adjustment we apply does not completely adjust reported (PAYE) wages to an equivalent hours basis. Firms with higher skilled workers pay higher wages, as evidenced by the coefficients on occupational class staff share variables.²² Controlling for industry and the mix of worker occupations, unionised firms have lower average wages.²³ Firms with relatively low shares of prime-age men pay less than firms with high shares of prime-age men (the reference group). Firms with longer tenure workers generally pay more (tenure of more than five years being the reference group). The often-observed firm-size wage premium is insignificantly different from zero once management practices and worker composition are controlled for. All subsequent regressions (excluding columns one and two of table 8) include a full set of industry, worker characteristic and management practice controls.

The association between performance pay systems and within-firm wage dispersion is strong (table 8). Focussing on the specification with full controls (column 3), we see that performance pay intensity is positively correlated with wage dispersion – firms with all staff on performance pay have a standard deviation of log wages a quarter of a percent higher (as a percentage of average wage) than firms with no performance pay. This relationship is weaker in firms that do not match performance pay with formal performance reviews. Wage dispersion is also higher in firms with performance reviews, and this relationship is stronger in firms that also have good general management practices (recalling that we also directly control for each of the component management practices).

²²The reference group is clerical, sales, service, production, transport, and labourers and related workers.

²³This positive association does not imply a direct causal relationship from unionisation to wages. For example, self-selection of low income workers into union membership would imply reverse causality.

Table 9 provides suggestive evidence that performance pay is more strongly associated with average wages in firms with higher shares of male employees. Here, we divide firms into quartiles (of total FTE) according to the proportion of female staff – the first quartile including the firms with the lowest share of female workers. Focussing on the first row of the table, we can see that the relationship between performance pay and average wages is larger in firms with proportionately more male workers (the 1st and 2nd/3rd quartiles) compared with firms with the highest share of female workers (the 4th quartile). Point estimates of the association between wage dispersion and performance pay are lower in high male share firms than high female share firms (though not significantly different).

Tables 10 and 11 test these relationships in a panel setting where, in addition to the management and worker composition controls, we now additionally control for unobserved time-invariant firm characteristics.²⁴ Identification of parameters now comes solely from variation in practices over time. As reported in table 4, a full (FTE-weighted) half of observations have no variation in performance pay intensity. Controlling for firm fixed effects, the average relationship between performance pay and average wages (full sample column of table 10) disappears. The effect is now concentrated purely in low female share firms (1st quartile column). There is no significant effect when we separate firms into those that either decrease or increase their prevalence of performance pay (columns 5 and 6).

In contrast, the relationship between performance pay intensity and wage dispersion remains significant with the inclusion of fixed effects (table 11). The estimated coefficient on performance pay is similar for the full sample, the first and fourth quartile of female employment share, and for the subset of firms that are increasing/decreasing performance pay intensities.

Given the consistency of the firm-level results on wage dispersion, and the evidence that gender is correlated with effect size, the remainder of the paper concentrates on heterogeneity in outcomes for different worker types.

²⁴Firm-level controls in panel regressions exclude industry dummies, since these are time-invariant by construction and, therefore, absorbed into the fixed effect.

3.2 Worker-level regressions

As a bridge between the firm and worker level, Table 12 (first two columns) mimics the OLS results from table 7 for log wages. This regression differs from the firm-level equivalent in two important respects. First, the worker-level wage variable introduces within-firm variation in wages (as summarised in table 2). Second, age and tenure are now included as continuous (worker-level) quartic functions rather than (firm-level) employment shares. These quartics, together with dummies for young and old workers, have separate estimated coefficients by gender (reported side-by-side in the table). Despite these changes, coefficients on performance pay system variables are similar to those in table 7, though now all-but-one are significant at the one percent level. This regression also clearly shows a sizeable gender wage gap of around 24 percent,²⁵ controlling for worker age and tenure, as well as firm and industry characteristics (though not occupation).

The second regression in table 12 introduces job (ie, worker-firm) fixed effects for the 166,000 workers who maintain employment in the same firm over the two time periods. These fixed effects control for unobserved job characteristics and worker ability insofar as these are constant over time. Accordingly, parameters of interest are identified solely from workers who stay with an employer, and whose employer changes their performance pay system.²⁶ Consistent with the full sample firm-level fixed effects regression (table 10), there is a weak and insignificant positive link between performance pay and log wages at the individual level. We now focus on whether there are subsets of workers who benefit from performance pay systems, as intimated by the firm-level results.

We approach this analysis by predicting the wage of each worker in 2005 using an estimated (OLS) wage equation like that in table 12, including industry

²⁵This percentage is calculated as $\exp(\beta_{\text{Female}}) - 1$.

²⁶Performance pay coefficients in firm-level fixed effects regressions limited to staying workers (restricting both left-hand side and worker age and tenure variables) have similar coefficients (in sign and significance) to reported results including all workers. At the worker level, restricting the OLS regression in table 12 to workers in the panel produces similar coefficients to the full sample OLS in terms of signs and significance. The main differences appear in the raw gender wage gap, where the OLS coefficient for the panel subsample is -0.404 (compared to -0.273 in the full sample), and in the coefficient of performance pay where the coefficient is 0.141 (compared with 0.108 in the full sample).

dummies but excluding other firm-level management and worker share variables.²⁷ We then divide workers into quartiles of the predicted wage. The large estimated gender wage gap results in a very low proportion of women in the top quartile of the predicted wage distribution – 3 percent of women versus 41 percent of men (table 13). Table 14 looks at the distribution of performance pay intensities for each of the eight (quartile by gender) groups. The key point to take from this table is that women with high expected pay are no less likely than men to sort into firms with performance pay. In fact, if anything, women in the third and fourth quartile of the expected wage distribution are more likely to be in firms with more than half of employees on performance pay. At face value, this sorting is consistent with female employees expecting a positive return to performance pay.

Tables 15 and 16 repeat the job fixed effect specification of table 12 for each quartile of the predicted wage distribution (columns labelled “All”), and for each quartile by worker gender. It is apparent from these tables that the positive effect of performance pay on average wages is concentrated in the fourth quartile of the expected (initial) wage distribution. The differential impact of performance pay on low and high-paid workers fits with the robust estimated relationship between performance pay systems and within-firm wage dispersion.

Looking at just the top quartile of the predicted wage distribution (table 16, last three columns), estimated coefficients for women are insignificantly different from zero,²⁸ in contrast to estimates for men which suggest that adoption of performance pay raises their wages.²⁹

Performance pay systems could have a differential effect on men and women for a number of reasons. As discussed in the introduction, these results could be driven by occupational segregation. While the reported coefficients control for job fixed effects, if women disproportionately sort into jobs that either intrinsically yield lower returns to performance pay, or are less likely to be

²⁷This regression has an R^2 of 0.38, compared with 0.44 in the same regression including firm-level variables (ie, the OLS column of table 12). Coefficients on worker characteristics are very similar and are not reported for brevity.

²⁸Standard errors are very large for fourth quartile females, reflecting the small number of workers involved and, consequently, the very small firm sample size from which variation in performance pay systems is derived.

²⁹Coefficients on the performance pay variable interacted with the review variable imply that these effects are absent when performance reviews are not also conducted.

subject to performance pay, then this would be reflected in different coefficient for men and women. In other words, since we observe performance pay on an intensity scale at the firm-level and apply this intensity to the worker level, rather than directly observing each worker’s terms of employment, the reported coefficient could confound the impact on wages with the probability of being offered performance pay.

Alternatively, or additionally, it may be that men and women face different obstacles to adjusting their effort in the face of changing work incentives. Finally, as discussed in the introduction, it could be that performance pay provides discriminating managers with an opportunity to exercise their preference for a particular kind of worker, either through selectively offering performance pay or through the differential application of rewards under the system.

We examine this latter possibility by testing whether estimated coefficients differ based on the gender of the boss – strictly speaking, the highest paid individual – in the firm.³⁰ Table 17 shows that firms with male and female bosses offer similar levels of performance pay to staff, though female-led firms are less likely to have 100 percent of staff on performance pay, and are more likely to have no performance pay at all.

For this analysis, we pool workers in the top half (ie, 3rd and 4th quartiles) of the expected wage distribution so as to have sufficient observations of female workers in woman-led firms. Table 18 reports results by boss and worker gender, with counts of firms and workers reinforcing the point that most firms have male bosses. The patterns in this table are consistent with the overall picture presented in table 16 – performance pay benefits are concentrated in high (expected) wage male workers, regardless of the gender of the boss.³¹

³⁰We give precedence to women in the case where multiple people receive the maximal wages.

³¹Even if performance pay effects for females workers were shown to differ by boss gender, this would not be a sufficient statistic to infer discrimination. Women may simply be more productive working for other women, and therefore do better when performance pay systems are introduced which reward this higher productivity. A number of studies have identified mechanisms through which female managers improve the outcomes for female workers (eg, Cardoso and Winter-Ebmer 2010). Relatedly, women with higher intrinsic productivity may sort into firms run by women because having women in senior management positions provides a signal of better career opportunities, or it may be that firms with female leaders are simply more likely to have women in jobs that would attract performance pay if it were introduced.

4 Conclusions

At the firm and worker level, there is a consistent and strong cross-sectional relationship between performance pay and average wages, controlling for industry, worker characteristics and a broad range of other management practices in the firm. At the same time firm-level fixed effects estimates suggest that firms with performance pay have a higher within-firm variation in wages, suggesting that the benefits of such systems vary across workers.

This paper focuses on two worker dimensions over which the impact of performance pay systems might be expected to differ – gender and initial (predicted) wage. Job fixed effects regressions show that the positive effect of performance pay on wages is restricted to high-wage workers, consistent with the observed within-firm widening of the wage distribution. Further, the effect of performance pay on high-wage workers is only apparent for men. Given the apparent absence of an effect on female wages and the concentration of prime-age men in the top quartile of the wage distribution, women, on average, appear to benefit less from the operation of performance pay systems.

The absence of an estimated effect for high-wage women could be explained by a number of factors including job sorting, differential ability to adjust labour supply, or discriminating managers. A weak test of this last theory, rejects the hypothesis that female workers experience different outcomes under male and female bosses. Overall, our results suggests that, if discrimination is a factor, it is more likely occurring at the margin of access to high pay jobs that attract higher returns in the presence of performance pay systems. More general analysis of the differences between male- and female-led firms, covering a wider range of relative labour market outcomes for women, might shed light on these issues.

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Tables

Table 1: Sample size

| Industry | Average FTE | | Number of firms | | |
|------------------------------------|----------------|----------------|-----------------|--------------|--------------|
| | Cross-section | Panel | 2005 | 2009 | Panel |
| Agriculture, forestry & fishing | 14,300 | 8,050 | 681 | 480 | 249 |
| Mining | 2,500 | 865 | 54 | 75 | 27 |
| Manufacturing | 118,600 | 75,100 | 1,443 | 1,398 | 813 |
| Electricity, gas & water | 2,450 | 1,250 | 12 | 15 | 6 |
| Construction | 22,750 | 14,300 | 384 | 285 | 159 |
| Wholesale trade | 42,250 | 33,150 | 573 | 504 | 354 |
| Retail trade | 51,250 | 42,250 | 405 | 441 | 222 |
| Accommodation, cafés & restaurants | 11,150 | 6,550 | 237 | 189 | 102 |
| Transport & storage | 23,250 | 14,800 | 327 | 267 | 150 |
| Communication services | 13,750 | 7,400 | 90 | 66 | 36 |
| Finance & insurance | 31,700 | 25,950 | 348 | 282 | 189 |
| Property & business services | 63,550 | 40,650 | 1,269 | 1,101 | 663 |
| Education | 5,900 | 4,400 | 165 | 141 | 87 |
| Cultural & recreational services | 21,050 | 11,200 | 372 | 315 | 174 |
| Personal & other services | 10,250 | 6,750 | 210 | 204 | 111 |
| TOTAL | 434,700 | 292,665 | 6,570 | 5,763 | 3,342 |

Industry is reported at the one-digit level based on the Australia-New Zealand System of Industry Classification 1996. Firms are assigned to a permanent industry based on employment shares.

Table 2: Summary statistics of key variables

| | Mean | 2005 | | Mean | 2009 | |
|-----------------------------------|--------|-------|--------|--------|-------|--------|
| | | Firm | Worker | | Firm | Worker |
| Mean $\ln(w)$ | 10.726 | 0.320 | 0.511 | 10.807 | 0.298 | 0.488 |
| Coefficient of variation $\ln(w)$ | 3.612 | 0.845 | | 3.448 | 0.878 | |
| Performance pay | 0.429 | | | 0.405 | | |
| Performance review | 0.926 | | | 0.931 | | |
| Review less than pay | 0.113 | | | 0.082 | | |

w is the FTE-adjusted real (2009) wage for non-working proprietor PAYE earners in the Linked Employer-Employee Database. The coefficient of variation is expressed as a percentage (ie, as 100 times the standard deviation over the average log wage). Reported statistics are FTE-weighted.

Table 3: Summary wage measures by performance pay system

| Performance pay | Proportion of FTE | | Mean $\ln(w)$ | | Mean of CV $\ln(w)$ | |
|------------------|--------------------|-------|--------------------|--------|---------------------|-------|
| | Performance review | | Performance review | | Performance review | |
| | 0 | > 0 | 0 | > 0 | 0 | > 0 |
| 0 | 0.045 | 0.148 | 10.630 | 10.647 | 2.765 | 3.022 |
| (0, 15] percent | 0.014 | 0.335 | 10.668 | 10.705 | 3.208 | 3.462 |
| (15, 50] percent | 0.005 | 0.159 | 10.766 | 10.831 | 3.632 | 3.728 |
| (50, 99] percent | 0.003 | 0.185 | 10.596 | 10.897 | 2.928 | 3.912 |
| 100 percent | 0.005 | 0.101 | 10.815 | 10.903 | 3.274 | 3.853 |

w is the FTE-adjusted real (2009) wage for non-working proprietor PAYE earners in the Linked Employer-Employee Database. The coefficient of variation is expressed as a percentage (ie, as 100 times the standard deviation over the average log wage). Reported statistics are FTE-weighted.

Table 4: Performance pay transitions – sample proportions

| 2005 | 2009 | | | | |
|------------------|--------------|-----------------|------------------|------------------|--------------|
| | 0 | (0, 15] percent | (15, 50] percent | (50, 99] percent | 100 percent |
| 0 | 0.109 | 0.053 | 0.007 | 0.004 | 0.005 |
| (0, 15] percent | 0.043 | 0.205 | 0.037 | 0.016 | 0.008 |
| (15, 50] percent | 0.014 | 0.056 | 0.065 | 0.038 | 0.013 |
| (50, 99] percent | 0.020 | 0.028 | 0.027 | 0.104 | 0.011 |
| 100 percent | 0.007 | 0.028 | 0.005 | 0.051 | 0.048 |

Reported statistics are average FTE-weighted across the two time periods.

Table 5: Performance review transitions – sample proportions

| 2005 | 2009 | |
|------|--------------|--------------|
| | 0 | > 0 |
| 0 | 0.025 | 0.036 |
| > 0 | 0.033 | 0.906 |

Reported statistics are average FTE-weighted.

Table 6: Combined transitions in performance pay and performance review

| Performance pay | Performance reviews | | |
|-----------------|---------------------|-----------------|-----------|
| | Declined | Stayed the same | Increased |
| Declined | 0.010 | 0.263 | 0.006 |
| Stayed the same | 0.021 | 0.489 | 0.020 |
| Increased | 0.003 | 0.179 | 0.009 |

Reported statistics are average FTE-weighted.

Table 7: Firm-level OLS – average log wage

| | (1) | (2) | (3) |
|-------------------------------------|----------|----------|----------|
| performance pay | 0.318** | 0.205** | 0.093** |
| | [0.042] | [0.020] | [0.012] |
| perf pay x review less than pay | -0.081 | -0.082 | -0.018 |
| | [0.072] | [0.042] | [0.030] |
| perf pay x high other practices | 0.110 | 0.018 | 0.013 |
| | [0.073] | [0.031] | [0.019] |
| review less than pay | -0.035 | -0.030 | -0.018 |
| | [0.025] | [0.018] | [0.014] |
| performance review | 0.020 | 0.078** | 0.013 |
| | [0.031] | [0.022] | [0.012] |
| perf review x high other practices | -0.041 | 0.045 | 0.000 |
| | [0.059] | [0.042] | [0.020] |
| Share of staff: part-time | | | -0.109** |
| | | | [0.012] |
| Managers & profs. | | | 0.398** |
| | | | [0.020] |
| Technicians & assoc. profs. | | | 0.248** |
| | | | [0.028] |
| Tradespersons & related | | | 0.066** |
| | | | [0.013] |
| Any collective employment agreement | | | -0.034** |
| | | | [0.007] |
| Share of staff: young female | | | -0.868** |
| | | | [0.036] |
| prime-age female | | | -0.643** |
| | | | [0.032] |
| old female | | | -1.206** |
| | | | [0.045] |
| young male | | | -1.185** |
| | | | [0.050] |
| old male | | | -0.802** |
| | | | [0.045] |
| tenure (0, 1] year | | | -0.171** |
| | | | [0.028] |
| tenure (1, 2] year | | | -0.090** |
| | | | [0.022] |
| tenure (2, 3] year | | | -0.009 |
| | | | [0.027] |
| tenure (3, 4] year | | | -0.045 |
| | | | [0.027] |
| tenure (4, 5] year | | | -0.091* |
| | | | [0.045] |
| ln(firm FTE) | | | 0.003 |
| | | | [0.002] |
| Constant | 10.723** | 10.515** | 11.143** |
| | [0.018] | [0.014] | [0.036] |
| N(obs) | 12,342 | 12,342 | 12,342 |
| Total FTE | 869,200 | 869,200 | 869,200 |
| R^2 | 0.122 | 0.493 | 0.775 |
| Other management practices | NO | NO | YES |
| Industry dummies | NO | YES | YES |

Young, prime-aged and old are defined as < 30 , $30-50$ & > 50 respectively. Omitted share categories are: more than five years tenure; prime-age males; and workers in clerical, sales, service, production, transport, and labourers and related occupations. Other management practices cover a broad range of topics, and are included as 55 binary variables each representing above average use of a particular business practice. Industry dummies are largely at the two-digit level. All regression include a 2009 year dummy and are FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 8: Firm-level OLS – coefficient of variation of log wage

| | (1) | (2) | (3) |
|-------------------------------------|----------|----------|----------|
| performance pay | 0.963** | 0.482** | 0.265** |
| | [0.083] | [0.065] | [0.054] |
| perf pay x review less than pay | -0.796** | -0.552** | -0.391** |
| | [0.201] | [0.131] | [0.118] |
| perf pay x high other practices | 0.087 | -0.058 | -0.098 |
| | [0.150] | [0.105] | [0.086] |
| review less than pay | -0.106 | -0.028 | 0.033 |
| | [0.101] | [0.086] | [0.068] |
| performance review | 0.394** | 0.383** | 0.273** |
| | [0.062] | [0.062] | [0.060] |
| perf review x high other practices | 0.199* | 0.205* | 0.247* |
| | [0.098] | [0.100] | [0.099] |
| Share of staff: part-time | | | 0.000 |
| | | | [0.050] |
| Managers & profs. | | | 0.842** |
| | | | [0.078] |
| Technicians & assoc. profs. | | | 0.616** |
| | | | [0.099] |
| Tradespersons & related | | | -0.077 |
| | | | [0.055] |
| Any collective employment agreement | | | -0.129** |
| | | | [0.031] |
| Share of staff: young female | | | 0.144 |
| | | | [0.166] |
| prime-age female | | | 0.838** |
| | | | [0.144] |
| old female | | | -0.989** |
| | | | [0.205] |
| young male | | | -0.689** |
| | | | [0.165] |
| old male | | | -0.840** |
| | | | [0.211] |
| tenure (0, 1] year | | | -0.297* |
| | | | [0.121] |
| tenure (1, 2] year | | | -0.039 |
| | | | [0.105] |
| tenure (2, 3] year | | | -0.030 |
| | | | [0.127] |
| tenure (3, 4] year | | | 0.076 |
| | | | [0.152] |
| tenure (4, 5] year | | | -0.236 |
| | | | [0.153] |
| ln(firm FTE) | | | 0.066** |
| | | | [0.011] |
| Constant | 3.625** | 3.222** | 2.824** |
| | [0.031] | [0.065] | [0.145] |
| N(obs) | 12,342 | 12,342 | 12,342 |
| Total FTE | 869,200 | 869,200 | 869,200 |
| R ² | 0.156 | 0.360 | 0.469 |
| Other management practices | NO | NO | YES |
| Industry dummies | NO | YES | YES |

Young, prime-aged and old are defined as < 30, 30-50 & > 50 respectively. Omitted share categories are: more than five years tenure; prime-age males; and workers in clerical, sales, service, production, transport, and labourers and related occupations. Other management practices cover a broad range of topics, and are included as 55 binary variables each representing above average use of a particular business practice. Industry dummies are largely at the two-digit level. All regression include a 2009 year dummy and are FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 9: Firm-level OLS by quartile of female employment share

| | Mean $\ln(w)$ | | | Coefficient of variation | | |
|------------------------------------|--------------------|--------------------|---------------------|--------------------------|---------------------|---------------------|
| | 1st | 2nd/3rd | 4th | 1st | 2nd/3rd | 4th |
| performance pay | 0.080** [0.019] | 0.096** [0.014] | 0.045** [0.016] | 0.140* [0.066] | 0.225** [0.063] | 0.219** [0.078] |
| perf pay x review less than pay | 0.046 [0.049] | -0.044 [0.033] | -0.044 [0.047] | -0.266 [0.144] | -0.619** [0.152] | -0.523** [0.197] |
| perf pay x high other practices | 0.077* [0.032] | 0.014 [0.022] | -0.082** [0.025] | -0.097 [0.110] | 0.007 [0.098] | -0.549** [0.123] |
| review less than pay | -0.035 [0.023] | -0.016 [0.014] | 0.022 [0.017] | 0.049 [0.058] | 0.154* [0.072] | 0.197* [0.088] |
| performance review | -0.011 [0.013] | 0.011 [0.017] | 0.041** [0.012] | 0.059 [0.054] | 0.467** [0.077] | 0.287** [0.069] |
| perf review x high other practices | -0.012 [0.025] | -0.009 [0.029] | 0.016 [0.023] | -0.054 [0.119] | 0.304* [0.127] | 0.193 [0.123] |
| N(obs) | 3,780 | 5,118 | 3,444 | 3,780 | 5,118 | 3,444 |
| Total FTE | 217,300 | 442,000 | 209,900 | 217,300 | 442,000 | 209,900 |
| R^2 | 0.650 | 0.810 | 0.836 | 0.454 | 0.515 | 0.598 |

All regressions include year, industry, worker characteristic and management practices controls as reported in column three of table 7. All regression are FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 10: Firm-level fixed effects – average log wage

| | Full sample | Quartile of female share | | | Change in perf pay | |
|------------------------------------|-------------------|--------------------------|-------------------|-------------------|--------------------|--------------------|
| | | 1st | 2nd/3rd | 4th | Declined | Increased |
| performance pay | 0.002 [0.010] | 0.047** [0.013] | -0.014 [0.012] | 0.011 [0.012] | 0.019 [0.021] | 0.013 [0.022] |
| perf pay x review less than pay | -0.020 [0.021] | -0.058 [0.030] | 0.001 [0.025] | -0.048 [0.051] | 0.007 [0.033] | -0.074* [0.029] |
| perf pay x high other practices | 0.001 [0.013] | 0.012 [0.016] | -0.004 [0.017] | -0.014 [0.021] | -0.008 [0.019] | -0.020 [0.020] |
| review less than pay | 0.008 [0.009] | -0.009 [0.013] | 0.012 [0.012] | 0.008 [0.014] | 0.015 [0.014] | -0.004 [0.014] |
| performance review | 0.007 [0.008] | -0.005 [0.009] | 0.001 [0.015] | 0.015 [0.014] | 0.033 [0.022] | 0.013 [0.015] |
| perf review x high other practices | 0.000 [0.015] | -0.009 [0.018] | -0.010 [0.027] | 0.007 [0.024] | 0.023 [0.036] | 0.046 [0.028] |
| N(firms) | 3,342 | 942 | 1,467 | 933 | 837 | 642 |
| Total FTE | 585,300 | 141,100 | 302,200 | 142,000 | 163,600 | 111,640 |
| Within R^2 | 0.451 | 0.424 | 0.502 | 0.691 | 0.532 | 0.615 |

All regressions include year, worker characteristic and management practices controls as reported in column three of table 7. All regression are average FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 11: Firm-level fixed effects – coefficient of variation of log wage

| | Full sample | Quartile of female share | | | Change in perf pay | |
|------------------------------------|--------------------|--------------------------|-------------------|--------------------|--------------------|--------------------|
| | | 1st | 2nd/3rd | 4th | Declined | Increased |
| performance pay | 0.175** [0.053] | 0.190** [0.072] | 0.100 [0.070] | 0.169* [0.074] | 0.199 [0.109] | 0.245 [0.137] |
| perf pay x review less than pay | -0.239* [0.120] | -0.105 [0.161] | -0.119 [0.141] | -0.645* [0.272] | -0.147 [0.177] | -0.441* [0.193] |
| perf pay x high other practices | 0.043 [0.071] | 0.113 [0.102] | 0.141 [0.090] | -0.185 [0.110] | 0.041 [0.096] | 0.105 [0.119] |
| review less than pay | 0.051 [0.045] | 0.027 [0.067] | 0.082 [0.062] | 0.069 [0.097] | -0.033 [0.069] | 0.169* [0.078] |
| performance review | 0.042 [0.049] | 0.021 [0.056] | 0.032 [0.067] | 0.093 [0.128] | 0.058 [0.088] | 0.305* [0.131] |
| perf review x high other practices | 0.050 [0.084] | -0.193 [0.120] | 0.124 [0.108] | 0.187 [0.223] | 0.048 [0.127] | 0.192 [0.256] |
| N(firms) | 3,342 | 942 | 1,467 | 933 | 837 | 642 |
| Total FTE | 585,300 | 141,100 | 302,200 | 142,000 | 163,600 | 111,640 |
| Within R^2 | 0.253 | 0.235 | 0.383 | 0.373 | 0.381 | 0.336 |

All regressions include year, worker characteristic and management practices controls as reported in column three of table 7. All regression are average FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 12: Worker-level OLS and job fixed effects – log wage

| | OLS | | Job FE | |
|-------------------------------------|-----------|----------|----------|----------|
| performance pay | 0.108** | | 0.001 | |
| | [0.002] | | [0.003] | |
| perf pay x review less than pay | -0.025** | | -0.052** | |
| | [0.005] | | [0.006] | |
| perf pay x high other practices | 0.013** | | -0.010** | |
| | [0.003] | | [0.004] | |
| review less than pay | -0.017** | | 0.007** | |
| | [0.002] | | [0.003] | |
| performance review | 0.023** | | 0.009** | |
| | [0.002] | | [0.003] | |
| perf review x high other practices | 0.003 | | 0.006 | |
| | [0.003] | | [0.005] | |
| Share of staff: part-time | -0.132** | | 0.001 | |
| | [0.002] | | [0.003] | |
| Managers & profs. | 0.443** | | 0.000 | |
| | [0.003] | | [0.005] | |
| Technicians & assoc. profs. | 0.291** | | 0.007 | |
| | [0.003] | | [0.004] | |
| Tradespersons & related | 0.078** | | 0.000 | |
| | [0.002] | | [0.003] | |
| Any collective employment agreement | -0.039** | | -0.012** | |
| | [0.001] | | [0.002] | |
| ln(firm FTE) | 0.002** | | 0.029** | |
| | [0.000] | | [0.002] | |
| | FEMALE | MALE | FEMALE | MALE |
| Female | -0.273** | | | |
| | [0.003] | | | |
| Young | -0.400** | -0.693** | -0.860** | -0.958** |
| | [0.002] | [0.002] | [0.048] | [0.047] |
| Old | -0.235** | -0.432** | 0.033 | -0.102** |
| | [0.005] | [0.005] | [0.037] | [0.036] |
| Age/10 | -0.052** | -0.015** | 0.120** | 0.052** |
| | [0.001] | [0.001] | [0.016] | [0.016] |
| Age ² /1,000 | -0.067** | -0.776** | -0.052* | -0.388** |
| | [0.009] | [0.009] | [0.023] | [0.018] |
| Age ³ /10,000 | 0.065** | 0.092** | -0.049** | 0.095** |
| | [0.005] | [0.005] | [0.008] | [0.007] |
| Age ⁴ /100,000 | -0.057** | 0.019** | -0.069** | -0.024** |
| | [0.002] | [0.002] | [0.004] | [0.004] |
| Tenure | 0.210** | 0.361** | 0.086** | 0.050** |
| | [0.008] | [0.008] | [0.017] | [0.015] |
| Tenure ² | -0.122** | -0.226** | -0.051** | -0.017 |
| | [0.007] | [0.008] | [0.014] | [0.012] |
| Tenure ³ | 0.034** | 0.063** | 0.016** | 0.006 |
| | [0.003] | [0.003] | [0.004] | [0.004] |
| Tenure ⁴ | -0.003** | -0.006** | -0.002** | -0.001 |
| | [0.000] | [0.000] | [0.000] | [0.000] |
| Tenure over five years | 0.230** | 0.346** | 0.108** | 0.098** |
| | [0.002] | [0.002] | [0.007] | [0.006] |
| Constant | 10.479** | | 10.671** | |
| | [0.005] | | [0.017] | |
| N(obs) | 1,618,100 | | 166,000 | |
| Total FTE | 869,200 | | 261,700 | |
| Overall R^2 (Within R^2) | 0.439 | | 0.944 | (0.256) |

Age is actual age less 45 years, censored below 18 (young) & above 65 (old). Workers in clerical, sales, service, production, transport, and labourers and related occupations is omitted share. Both regressions include controls for other management practices (55 binary variables representing above average use of a practice), and a 2009 year dummy. The OLS regression includes industry dummies. All regression are FTE-weighted (OLS) or average FTE-weighted (FE). Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 13: Quartile of expected wage by gender in 2005 – sample proportions

| Quartile of $E(w)$ | Men | Women | Overall |
|--------------------|-------|-------|---------|
| 1st | 0.139 | 0.402 | 0.250 |
| 2nd | 0.152 | 0.385 | 0.250 |
| 3rd | 0.297 | 0.186 | 0.250 |
| 4th | 0.413 | 0.027 | 0.250 |
| Total | 1.000 | 1.000 | 1.000 |

Reported statistics are FTE-weighted.

Table 14: Performance pay by 2005 expected wage quartile

| Performance pay | Quartile of $E(w)$ for Men | | | | Quartile of $E(w)$ for Women | | | |
|------------------|----------------------------|-------|-------|-------|------------------------------|-------|-------|-------|
| | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th |
| 0 | 0.227 | 0.228 | 0.210 | 0.148 | 0.241 | 0.189 | 0.109 | 0.045 |
| (0, 15] percent | 0.397 | 0.358 | 0.335 | 0.294 | 0.428 | 0.317 | 0.224 | 0.056 |
| (15, 50] percent | 0.155 | 0.156 | 0.182 | 0.199 | 0.129 | 0.192 | 0.168 | 0.300 |
| (50, 99] percent | 0.112 | 0.142 | 0.152 | 0.222 | 0.089 | 0.182 | 0.348 | 0.278 |
| 100 percent | 0.109 | 0.117 | 0.121 | 0.137 | 0.112 | 0.120 | 0.152 | 0.321 |
| Total | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

Reported statistics are FTE-weighted.

Table 15: Worker-level job fixed effects by expected wage quartile and gender – bottom half of distribution

| | 1st quartile of predicted wage | | 2nd quartile of predicted wage | | 3rd quartile of predicted wage | | 4th quartile of predicted wage | |
|------------------------------------|--------------------------------|---------------------|--------------------------------|---------------------|--------------------------------|---------------------|--------------------------------|--------|
| | All | Female | Male | All | Female | Male | All | Female |
| performance pay | -0.007 [0.007] | -0.010 [0.008] | -0.015 [0.014] | -0.011* [0.006] | -0.004 [0.007] | -0.028** [0.011] | | |
| perf pay x review less than pay | -0.058** [0.017] | -0.063** [0.021] | -0.038 [0.032] | -0.073** [0.014] | -0.088** [0.017] | -0.046 [0.024] | | |
| perf pay x high other practices | -0.016 [0.010] | -0.023* [0.011] | 0.003 [0.020] | -0.022** [0.008] | -0.051** [0.009] | 0.047** [0.015] | | |
| review less than pay | 0.019* [0.008] | 0.029** [0.010] | 0.005 [0.015] | 0.009 [0.006] | 0.005 [0.007] | 0.021* [0.010] | | |
| performance review | 0.019* [0.008] | 0.018* [0.009] | 0.022 [0.014] | 0.015* [0.006] | 0.017* [0.007] | 0.010 [0.011] | | |
| perf review x high other practices | 0.002 [0.012] | 0.013 [0.014] | -0.018 [0.023] | 0.013 [0.010] | 0.013 [0.012] | 0.002 [0.020] | | |
| N(firms) | 3,633 | 1,932 | 1,701 | 4,341 | 2,319 | 2,022 | | |
| N(workers) | 38,700 | 28,700 | 10,000 | 38,700 | 26,400 | 12,300 | | |
| Total FTE | 47,800 | 36,500 | 11,300 | 58,400 | 40,500 | 17,900 | | |
| Within R^2 | 0.461 | 0.395 | 0.571 | 0.258 | 0.214 | 0.355 | | |

All regressions include year, worker characteristic and management practices controls as reported in the fixed effect regression of table 12. All regressions are average FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 16: Worker-level job fixed effects by expected wage quartile and gender – top half of distribution

| | 3rd quartile of predicted wage | | 4th quartile of predicted wage | |
|------------------------------------|--------------------------------|---------------------|--------------------------------|---------------------|
| | All | Female | Male | Male |
| performance pay | 0.003 [0.005] | -0.005 [0.010] | 0.009 [0.006] | 0.015** [0.004] |
| perf pay x review less than pay | -0.033** [0.012] | -0.018 [0.030] | -0.047** [0.014] | -0.056** [0.011] |
| perf pay x high other practices | -0.001 [0.007] | -0.036** [0.013] | 0.016 [0.009] | -0.037 [0.065] |
| review less than pay | 0.006 [0.005] | -0.009 [0.011] | 0.009 [0.006] | 0.006 [0.004] |
| performance review | 0.006 [0.006] | -0.022 [0.020] | 0.006 [0.006] | 0.011* [0.005] |
| perf review x high other practices | 0.003 [0.010] | -0.044 [0.032] | 0.002 [0.010] | -0.162 [0.130] |
| N(firms) | 3,795 | 1,326 | 2,469 | 2,250 |
| N(workers) | 41,400 | 15,300 | 26,100 | 47,100 |
| Total FTE | 69,100 | 25,900 | 43,200 | 86,200 |
| Within R^2 | 0.198 | 0.158 | 0.235 | 0.148 |

All regressions include year, worker characteristic and management practices controls as reported in the fixed effect regression of table 12. All regressions are average FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

Table 17: Performance pay by gender of boss – sample proportions

| Performance pay | Gender of boss | | Overall |
|------------------|----------------|--------|---------|
| | Male | Female | |
| 0 | 0.182 | 0.254 | 0.193 |
| (0, 15] percent | 0.348 | 0.350 | 0.349 |
| (15, 50] percent | 0.169 | 0.135 | 0.164 |
| (50, 99] percent | 0.186 | 0.206 | 0.189 |
| 100 percent | 0.115 | 0.054 | 0.106 |
| Total | 1.000 | 1.000 | 1.000 |

Reported statistics are FTE-weighted.

Table 18: Worker-level job fixed effects by worker and boss gender – top half of expected wage distribution

| | Only Male Boss | | Only Female Boss | |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|
| | All | Female | Male | All |
| performance pay | 0.023** [0.003] | -0.002 [0.010] | 0.028** [0.004] | 0.076* [0.033] |
| perf pay x review less than pay | -0.026** [0.008] | 0.034 [0.031] | -0.035** [0.009] | -0.209** [0.078] |
| perf pay x high other practices | 0.003 [0.005] | -0.053** [0.015] | 0.011* [0.005] | 0.103 [0.053] |
| review less than pay | 0.002 [0.003] | -0.010 [0.012] | 0.002 [0.004] | 0.042 [0.030] |
| performance review | 0.008 [0.004] | -0.031 [0.024] | 0.008* [0.004] | 0.036 [0.027] |
| perf review x high other practices | 0.006 [0.007] | -0.054 [0.036] | 0.006 [0.007] | -0.051 [0.042] |
| N(firms) | 3,108 | 948 | 2,160 | 312 |
| N(workers) | 71,300 | 11,100 | 60,200 | 1,710 |
| Total FTE | 126,500 | 19,300 | 107,200 | 2,700 |
| Within R^2 | 0.179 | 0.187 | 0.179 | 0.212 |
| | | | | 0.230 |
| | | | | 0.272 |

All regressions include year, worker characteristic and management practices controls as reported in the fixed effect regression of table 12. All regressions are average FTE-weighted. Robust standard errors in square brackets (** significant at 1%; * significant at 5% level).

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