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DEPARTMENT OF ECONOMICS

Working Paper

An Empirical Analysis of Risk Preferences, Compensation Risk, and Employee Outcomes

By

Fidan Ana Kurtulus

Douglas Kruse

Joseph Blasi

Working Paper 2011-10



**UNIVERSITY OF MASSACHUSETTS
AMHERST**

**AN EMPIRICAL ANALYSIS OF RISK PREFERENCES,
COMPENSATION RISK, AND EMPLOYEE OUTCOMES**

September 24th, 2010

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ABSTRACT

We use the NBER Shared Capitalism Database comprised of more than 40,000 employee surveys from 14 firms to explore whether a close match between workers' risk preferences and the riskiness of their compensation packages relates to improved employee outcomes including lower absenteeism, lower shirking, lower probability of voluntary turnover, greater worker motivation, and higher levels of job satisfaction and loyalty. To do this, we use survey questions reflecting workers' risk aversion parameters, coupled with a series of measures of the riskiness of workers' compensation packages including the proportion of pay comprised of various forms of shared capitalism such as profit and gain sharing, ownership of company stock, and bonus arrangements. The primary finding of our paper is that a match between the workers' risk preferences and the extent of risk in their compensation increases workers' motivation, job satisfaction, company attachment, and loyalty, but risk-averse workers are generally less responsive to a preference-compensation match than risk-loving workers.

We are grateful for comments from seminar participants at Rutgers University, the Beyster Fellows Conference on Shared Capitalism, and the 2011 Annual Meetings of the Allied Social Science Association. Corresponding Author: Fidan Ana Kurtulus, Assistant Professor, Department of Economics, University of Massachusetts-Amherst. E-mail: fidan@econs.umass.edu. Tel: (413) 545-2512. Address: 912 Thompson Hall, Department of Economics, University of Massachusetts, Amherst, MA, 01003.

INTRODUCTION

Employee compensation packages are often comprised of both a fixed salary portion and a variable portion that is tied to firm, group, or individual output or performance. Examples of performance-based pay include profit-sharing, company stock and stock option payments, and group-level or individual-level performance bonuses. The prevalence of employee participation in the financial performance of firms and other performance-based pay schemes has been growing in the past several decades in the U.S. and other advanced economies. According to the 2006 wave of the General Social Survey, which is a nationally representative survey of employees conducted by the National Opinion Research Center, over a third of U.S. workers are covered by profit sharing, 27 percent are covered by department- or team-based bonuses, 18 percent own company stock, and 9 percent own company stock options. Coverage is similar in France, Great Britain, Italy and Japan (Jones and Kato 1995, Del Boca et. al. 1999).

Firms use performance-based pay in employee compensation packages to induce greater worker effort and identification with the firm. However, performance-based pay introduces variability into compensation, which risk-averse workers dislike, and the greater the portion of compensation that is comprised of performance-based pay as opposed to a fixed salary, the greater is the compensation risk faced by the employee. In this study, we use the NBER Shared Capitalism Database, comprised of more than 40,000 employee surveys from 14 firms, to analyze whether a close match between workers' risk preferences and the riskiness of their compensation packages is related to improved employee outcomes such as lower absenteeism, lower shirking, lower probability of voluntary turnover, greater worker motivation, and higher levels of job satisfaction and loyalty.

An advantage of our data is that they contain information on individual-level measures of risk aversion, which is often discussed as an important factor in worker attitudes towards variable pay, but is rarely measured. We use this information, coupled with measures of the riskiness, or variability, of workers' compensation packages, including the proportion of pay comprised of various forms of shared capitalism such as ownership of company stock, profit and gain sharing, and bonus arrangements, to explore the consequences of alignment between risk preferences and compensation risk on worker outcomes. To our knowledge, this is the first study to empirically examine the implications of a preference-compensation risk match on employee outcomes. The primary finding of our paper is that a match between the worker's risk preferences and the extent of risk in his or her compensation is associated with higher levels of motivation, job satisfaction, company attachment, and loyalty, but that risk-averse workers are generally less responsive to a preference-compensation match than risk-loving workers.

THEORETICAL FRAMEWORK AND PAST LITERATURE

A basic assumption in most theoretical models of the employee-employer relationship is that the worker is risk averse, deriving greater utility, or happiness, from fixed pay over variable pay of equal expected value (Milgrom and Roberts 1992, Holmstrom 1979, Shavell 1979). Furthermore, the more risk averse the worker is, the greater will be the reduction in his or her utility generated by variability in pay. Workers who are very risk averse will prefer to have lower compensation risk than those who are less risk averse. Therefore, an alignment of risk preferences and compensation risk is likely to lead to improved utility, reflected in improved worker outcomes like job satisfaction and company attachment.

There have been a few previous studies examining the relation between risk preferences and attitudes towards variable pay, and a fairly large literature on the relation between variable pay and worker outcomes, but there have not been any prior studies looking at how an alignment of risk preferences and compensation risk may lead to improved worker outcomes. This is the primary contribution of our paper to the literature. The few past studies on the role of risk preferences in shaping attitudes toward variable pay found risk aversion to reduce worker preferences for variable pay in laboratory experiments (Cadsby, Song, and Tapon 2007) as well as in actual work environments (Kurtulus, Kruse and Blasi 2010, Cornelissen, Heywood and Jirjahn 2008). On the other hand, there is a fairly large literature exploring the relation between variable pay and worker outcomes. For example, Wilson and Peel (1991) and Brown, Fakfakh and Sessions (1999) found that employee participation in profit sharing and share ownership lowers absenteeism and quit rates, Bryson and Freeman (2010) found that employee ownership increases labor productivity and Blasi, Freeman, Mackin and Kruse (2010) found that it increases worker motivation, and Green and Heywood (2008) found that profit sharing and bonuses increase job satisfaction. Our study links these two branches of the literature by examining how a preference-compensation risk match influences worker outcomes.

DATA AND VARIABLES

We use the NBER Shared Capitalism Database, which consists of detailed information collected from more than 40,000 employee surveys from 14 firms, to explore whether a close match between workers' risk preferences and the riskiness of their compensation packages relates to improved employee outcomes including lower absenteeism, lower probability of

voluntary turnover, greater worker motivation, and higher levels of job satisfaction, attachment to the company, loyalty, and innovation.

The NBER data comprise one of the largest worker-level datasets on labor practices and worker sentiment ever collected. The survey was conducted during 2002-2006 using a combination of web-based and paper survey methods, and had a high response rate, averaging 53 percent over the 14 companies. The firms participating in the survey included large multinationals with employment spanning North America, South America, Europe and Asia, as well as smaller firms with mostly US employees. The sample included eight firms in the manufacturing industry, two high-technology firms, and four in the service industry. Three of the fourteen companies exceeded 10,000 employees, five employed between 1,000 and 10,000 workers, and the remaining six employed fewer than 1,000 workers. All of the firms had employee ownership and variable pay programs, though of varying forms and degrees: thirteen had individual bonus plans, nine had workgroup-based or department-based performance bonus plans, eleven had broad-based profit-sharing plans, five had broad-based stock option plans, eight had standard employee stock ownership plans (ESOPs), one had a 401(k) employee stock ownership program, four had employee stock purchase plans, and three had 401(k)'s with company stock. Most had combinations of these plans.

The NBER employees of course may not be representative of the overall U.S. workforce—indeed they work at firms that view shared capitalism favorably and may have joined these firms because they are more favorably inclined towards shared capitalism and less averse to the compensation risk it creates than other workers. Shared capitalism is, however, unlikely to be the determining factor for most employees in choosing whether to work at an organization, so in these companies we would expect to also find many employees who care little

about shared capitalism and took the job for other reasons (e.g., pay, location, job fit, career opportunities). Consistent with this, there is substantial variation within these companies in attitudes toward shared capitalism (Kurtulus, Kruse and Blasi 2010). Furthermore, the high incidence of shared capitalism across the U.S. economy (Kruse, Blasi, and Park 2010) provides an indication that the results may be generalizable to other firms and workers.

In order to explore whether a close match between workers' risk preferences and the riskiness of their compensation packages relates to improved employee outcomes, we must first define an appropriate measure that captures a match between risk preferences and compensation risk. To do so, we make use of two variables in the NBER Shared Capitalism Database. Our indicator of a worker's risk preference is:

LOVERISK = Worker's self-assessment of his or her risk preference on a 0-10 scale, with 0 indicating the worker hates taking risk and 10 indicating the worker loves taking risk.¹

And, our indicator of how variable or risky is a worker's compensation package is:

COMPRISK = Share of the worker's base salary that is comprised of performance-related pay including cash profit-sharing, individual-based, workgroup-based or department-based performance bonuses.^{2,3}

We divide the distribution of COMPRISK into two halves, below (low COMPRISK) and at or above (high COMPRISK) the median. LOVERISK takes on values 0,1,2,...,10, with 0 indicating that the worker dislikes taking risks and 10 indicating the worker enjoys taking risk, so we divide LOVERISK into two halves, below (low LOVERISK) and at or above (high LOVERISK) the value of 5 (risk neutral).⁴ We then define the following indicators of match and non-match:

MATCH = 1 if LOVERISK is high and COMPRISK is high, OR LOVERISK is low and COMPRISK is low; 0 otherwise.

HIGHMATCH = 1 if LOVERISK is high and COMPRISK is high, 0 otherwise.

LOWMATCH = 1 if LOVERISK is low and COMPRISK is low, 0 otherwise.

NOMATCH = 1 if LOVERISK is high and COMPRISK is low, OR LOVERISK is low and COMPRISK is high; 0 otherwise.

NOMATCH10 = 1 if LOVERISK is high and COMPRISK is low, 0 otherwise.

NOMATCH01 = 1 if LOVERISK is low and COMPRISK is high, 0 otherwise.

Worker preference for risk has a mean of 5.6, but there is wide dispersion: LOVERISK equals 4 at the 25th percentile, 6 at the 50th percentile, and 7 at the 75th percentile. Variable pay comprises 13 percent of base salary for the typical worker, but again there is considerable variation: COMPRISK is 2 percent at the 25th percentile, 5 percent at the 50th percentile, and 15 percent at the 75th percentile. Forty percent of workers have a high preference for risk and a high level of compensation risk (HIGHMATCH=1), 14 percent have a low preference for risk and low compensation risk (LOWMATCH=1), 36 percent have a high preference for risk but low compensation risk (NOMATCH10=1), and the remaining 10 percent of workers have a low preference for risk but high compensation risk (NOMATCH01=1).

We examine the influence of alignment between risk preferences and compensation risk on the following worker outcome variables:

DAYSABS = Number of days absent in the last 6 months (non-vacation).

LOOKHARD = Worker reported likelihood that the worker will look hard for a job with another organization within the next twelve months on a scale of 1 to 4, with 1 indicating “not at all likely”, 2 indicating “somewhat likely”, 3 indicating “very likely”, and 4 indicating that the worker is “already looking”.

MOTIVATION = The worker’s willingness to work harder than he or she has in the past in order to help the company succeed, with 1 indicating “strongly disagree”, 2 indicating “disagree”, 3 indicating “neither agree nor disagree”, 4 indicating “agree”, and 5 indicating “strongly agree”.

JOBSATISFAC: Worker’s job satisfaction at the company on a scale of 1 to 7, with 1 indicating “completely dissatisfied” and 7 indicating “completely satisfied”.

LONGTIME: Dummy variable indicating whether the worker sees himself or herself working at the company for the foreseeable future, with 1 indicating “yes” and 0 indicating “no”.

LOYAL: Degree of loyalty the worker feels towards the company on a scale of 1 to 4, with 1 indicating “no loyalty at all”, 2 “only a little”, 3 “some” and 4 “a lot”

SUGGESTIONS: Worker reported frequency of suggestions to improve department or company effectiveness made to someone in the company in the past, with values 1-never, 2-occasionally, 3-monthly, 4-weekly, 5-daily.

Our regression specifications also include a wide array of worker characteristics as control variables that are likely to influence worker outcomes like motivation and attachment to the firm, and that may also be correlated with the worker’s risk preferences and the riskiness of his or her compensation. For instance, past research has shown women, older workers, workers with greater tenure at the firm, and workers with lower education and salary levels to be more risk averse (Niederle and Vesterlund 2007, Dohmen et al. 2007, Dohmen and Falk 2006, Kurtulus, Kruse and Blasi 2010). Many of these variables are also correlated with our worker outcome variables, so not controlling for them would yield biased estimates of the relationship between a preference-compensation match and worker outcomes. We additionally control for whether the worker believes his or her pay is at or above market level since this is likely to influence the relation between that worker’s preference-compensation risk match and that worker’s attachment to the firm, loyalty, motivation, and so on. A worker whose risk preferences and compensation risk are aligned may work longer hours because he or she derives greater enjoyment from his or her job, and this will also be reflected in his or her motivation, job satisfaction, and company attachment, so we also control for weekly hours worked. Lastly, in a few of the NBER firms, workers in specific occupations and those who are union members are not eligible to participate in certain profit sharing and bonus programs, so we include controls for the worker’s occupation and union status.

The control variables we include in all our regression models are defined below:

AGE = Worker age.

FEMALE = 1 if worker is female, 0 otherwise.

UNION = 1 if worker is a union worker, 0 otherwise.

TENURE = Worker's tenure at the firm, in years.

BASEPAY = Worker's annual base pay the previous year excluding overtime, bonuses and commissions.

HOURS = Worker's weekly hours worked.

ATMKT = 1 if the worker believes that his annual base salary at the firm is at or above the going market rate for employees in other companies with similar experience and job descriptions in the region, 0 otherwise.

Ethnicity Indicators

WHITE = 1 if worker is white, 0 otherwise.

HISPANIC = 1 if worker is Hispanic, 0 otherwise.

BLACK = 1 if worker is black, 0 otherwise.

ASIAN = 1 if worker is Asian, 0 otherwise.

NATIVE AMERICAN = 1 if worker is Native American, 0 otherwise.

OTHER = 1 if worker is Other, 0 otherwise.

Education Indicators

NO HIGH SCHOOL = 1 if worker does not hold a high school degree, 0 otherwise.

HIGH SCHOOL = 1 if worker's highest educational degree is a high school degree including GED, 0 otherwise.

SOME COLLEGE = 1 if worker has attended some college but has not received a bachelor's degree, 0 otherwise.

ASSOCIATE DEGREE = 1 if worker's highest educational degree is an associate's degree, 0 otherwise.

COLLEGE = 1 if worker's highest educational degree is a bachelor's degree, 0 otherwise.

GRADUATE SCHOOL = 1 if worker's highest educational degree is a master's, professional or doctoral degree, 0 otherwise.

Occupation Indicators

PRODUCTION: 1 if worker's occupation is production, 0 otherwise.

ADMINISTRATIVE SUPPORT = 1 if worker's occupation is administrative support, 0 otherwise.

PROFESSIONAL AND TECHNICAL = 1 if worker's occupation is professional and technical (including engineers and scientists), 0 otherwise.

SALES = 1 if worker's occupation is sales, 0 otherwise.

CUSTOMER SERVICE = 1 if worker's occupation is customer service, 0 otherwise.

MANAGEMENT = 1 if worker's occupation is management, 0 otherwise.

Descriptive statistics for all variables are provided in Table 1.

[TABLE 1 AROUND HERE]

RESULTS

Our hypothesis is that a match between the worker's risk preferences and extent of risk in his or her cash compensation will result in improved worker outcomes (lower absenteeism, lower likelihood of looking for a new job, higher motivation, greater job satisfaction, higher likelihood of staying with the company in the future, greater loyalty, and higher frequency of suggestions). This implies MATCH, HIGHMATCH and LOWMATCH should be associated with better worker outcomes, while NOMATCH, NOMATCH10 and NOMATCH01 should be associated with worse worker outcomes. Therefore we expect the relationships between the match variables and the worker outcome variables to have the following signs (and the non-match variables to

have the opposite of these signs): DAYSABS (-), LOOKHARD (-), MOTIVATION (+), JOBSATISFAC (+), LONGTIME (+), LOYAL (+), SUGGESTIONS (+).

As a first step in exploring whether a match between the worker's risk preferences and extent of risk in his or her compensation results in improved worker outcomes, we estimate regressions of each outcome variable on MATCH and worker controls. These results are presented in Table 2. We use OLS to estimate all except for the DAYSABS equation, where we estimate a Tobit model since that outcome variable is left-censored at zero, and LONGTIME, where we estimate a Probit model (with table entries indicating the Probit marginal effects) since that outcome variable is a dummy variable.

[TABLE 2 AROUND HERE]

The revealed relationships between MATCH and the various outcome measures overwhelmingly support our hypothesis that a match between the worker's risk preferences and extent of risk in his or her compensation will result in improved worker outcomes. The negative and statistically significant effects of MATCH on DAYSABS and LOOKHARD indicate that workers whose compensation risk match their risk attitudes exhibit lower absenteeism and lower intention to leave the firm. Table 2 also reveals that a match between the worker's risk preferences and extent of risk in his or her compensation increases worker motivation, job satisfaction, company attachment and loyalty. Frequency of suggestions to improve department or company effectiveness is the only outcome variable which is not statistically significantly associated with MATCH (last column).

The results in Table 2 support our hypothesis that a match between the worker's risk preferences and extent of risk in his or her compensation will result in improved worker outcomes, but also of interest is the possibility that the way in which employees respond to a

match will be different among risk-loving versus risk-averse workers. A possible reason for this asymmetry is that workers who are more risk averse may be more reluctant to leave their job to seek another one when they don't have a preference-compensation match, since they may not want to bear the uncertainty associated with being unemployed or not knowing how much better their new job will suit them. To explore possible asymmetries in the match response among the risk-loving and the risk-averse, we regress our worker outcome variables on the more specific match variables HIGHMATCH (which equals 1 if the worker is risk-loving and faces high compensation-risk, 0 otherwise) and LOWMATCH (which equals 1 if the worker is risk-averse and faces low compensation-risk, 0 otherwise) against the omitted category of NOMATCH (which equals 1 if the worker's risk preference does not match his or her compensation-risk level), controlling for the full set of worker characteristics.

The estimates presented in Table 3 reveal that the risk-averse are generally less responsive to a match while the risk-loving respond in the expected manner with improved outcomes: the coefficient on HIGHMATCH has the expected statistically significant sign in every equation except in the LOOKHARD equation, while the only outcome variables which have the expected relationship with LOWMATCH are DAYSABS and LOOKHARD. For example, the effect of a preference-compensation match on lowering absenteeism is stronger for risk-loving workers; and a match results in higher job satisfaction, firm attachment and loyalty among risk-loving workers as we would expect but has no statistically significant effect among risk-averse workers. Also of note is the surprising result that among the risk-averse the effect of a match on motivation and the frequency of innovative suggestions is lower in comparison to those with no preference-compensation match (the omitted group). We say more on the finding

that a match between the preferences of risk-averse workers and compensation risk does not necessarily improve outcomes at the end of this section.

[TABLE 3 AROUND HERE]

We next turn to a closer analysis of workers whose risk preferences do not match their compensation risk, i.e., those who either are risk-loving but face low compensation risk (NOMATCH10=1), or those who are risk-averse but face high compensation risk (NOMATCH01=1). We do this to explore the possibility that among workers whose risk preferences do not match the extent of compensation risk they face (i.e., NOMATCH=1) there may be asymmetries in behavior. For example, a lack of a match may result in inferior worker outcomes for the risk-loving but not the risk-averse, following the same reasoning introduced earlier, i.e., that the risk averse may be reluctant to leave their job and seek another thereby incurring income uncertainty associated with unemployment. To investigate this, using the subsample of workers whose risk-preferences do not match their compensation risk, we estimate regressions of our seven worker outcome variables on NOMATCH10 against the omitted category NOMATCH01, controlling for the full set of worker characteristics. The results in Table 4 reveal that among workers with no match, the risk-loving workers look harder for another job, have higher motivation, lower job satisfaction, lower intention to stay at the firm, and are less loyal to the firm, but offer more suggestions, than those who are risk-averse. Put differently, the risk-averse are generally less negatively affected by a mismatch between their risk preferences and the compensation risk they face.

[TABLE 4 AROUND HERE]

This echoes our earlier finding that for risk-averse workers a preference-compensation match does not necessarily improve outcomes, and in some cases may even lower worker

performance. There are at least four possible explanations for this. One is that even risk-averse workers like having output-contingent compensation despite their aversion to the variability it creates in their pay, perhaps because seeing their risk-loving colleagues receive variable compensation creates a desire for it among them as well, or because profit-sharing and bonuses instill a sense of ownership and cooperation that workers like despite their disutility from the risk it imposes on their earnings. Both risk-loving and risk-averse workers seem to have a baseline appreciation of the notion of incentives tied to performance, and while the risk-averse might prefer a less intense version of this scenario, it is not necessarily the case that they are not motivated by incentives. This issue is explored in greater detail in another paper of ours on worker attitudes towards different forms of employee ownership (Kurtulus, Blasi, and Kruse, 2010). Expanding on the findings that a preference-compensation match does not always yield improved outcomes in the case of risk-averse workers, we use a subsample of employees who have a low tolerance for risk (i.e., low LOVERISK) to estimate regressions of our seven employee outcome variables on NOMATCH01 (i.e., the person is risk-averse but faces high compensation risk) against the base group of workers who are risk-averse and face low compensation risk, controlling for the full set of worker characteristics. Results are illustrated in Appendix Table A. There is indeed some evidence that risk-averse workers exhibit better outcomes when they face high compensation risk than when they face low compensation risk in the case of attachment to the firm, loyalty, and frequency of innovative suggestions; however, in the case of the remaining outcome variables the results are not statistically significant at conventional levels.

A related potential explanation is that workers may respond favorably to having choice over the composition of their compensation rather than the firm choosing this paternalistically for them. We find some evidence supporting this hypothesis in the next section.

Risk-averse workers may also not mind performance-related pay when it is “gravy” on top of regular base pay, rather than substituting for base pay, in which case it may be seen as an uncertain gift from the company rather than something that may harm one’s economic position. The evidence from both national and company surveys indicates that shared capitalism pay tends to supplement rather than substitute for base pay (Kruse, Freeman, and Blasi 2010). The relation between performance-related pay, base pay, and risk aversion is a valuable area for further research.

Finally, previous research has shown profit sharing, employee ownership and other forms of variable pay to be most effective in increasing productivity and performance when implemented as part of a package of complementary high-performance workplace practices such as delegation of decision-making rights to workers, team production, and on-the-job training (Ichniowski, et. al. 1996, Ichniowski, Shaw and Prennushi 1997, Becker and Huselid 1998, Blasi, Freeman, Mackin and Kruse 2010); a match between risk preference and compensation risk may improve outcomes even for risk-averse workers when combined with complementary high-performance workplace practices. Though we do not explore this in the current paper, we view it as a fruitful avenue for future research.

Robustness Analysis

We also investigate an alternative compensation risk variable which includes further measures of employee ownership, in particular the value of stock and option holdings of the worker:

COMPRISK1 = Share of the worker's base salary that is comprised of performance-related pay (including profit-sharing, individual-based, workgroup-based or department-based performance bonuses), company stock held in ESOPs, 401K plans, and bought in the open market, and potential profit from exercising company options.⁵

The advantage of COMPRISK1 is that it is more inclusive of different forms of employee ownership and employee equity participation than COMPRISK. We estimate all our regressions using this alternative compensation risk measure COMPRISK1, and the associated match variables MATCH1, HIGHMATCH1, LOWMATCH1, NOMATCH101, NOMATCH011 (constructed exactly as before except using COMPRISK1 instead of COMPRISK).⁶ As seen in Tables 5-7, the estimated relationships of interest are generally qualitatively the same in sign and significance, but the magnitudes are slightly smaller when compared to the estimates from the regressions which used COMPRISK.

[TABLE 5 AROUND HERE]

[TABLE 6 AROUND HERE]

[TABLE 7 AROUND HERE]

Nevertheless, we prefer COMPRISK over COMPRISK1 and treat it as our main compensation risk measure for two reasons. First, COMPRISK is a sharper measure of the share of salary comprised of variable pay in a given year, while COMPRISK1 includes cumulative forms of employee ownership and employee equity participation that have been amassed over several years. Specifically, COMPRISK pertains to the portion of the worker's base salary comprised of profit-sharing and performance bonuses in a given year, while the stock and option holdings included in COMPRISK1 pertain to cumulative holdings and not just stock and option grants in a given year. Second, while the workers have no choice over the portion of salary comprised of profit-sharing and bonuses captured in COMPRISK, some components of

COMPRISK1 are subject to employee choice in a number of the firms in the NBER survey where workers had discretion over their investments in company stock. Using a compensation risk measure over which the worker has no choice, namely COMPRISK, helps prevent endogeneity bias in the regression estimates since the dependent variables are unlikely to affect COMPRISK (while they might plausibly affect worker decisions to purchase stock, so the COMPRISK1 specification will yield biased estimates due to reverse causality).⁷

CONCLUSION

Past studies on risk preferences, compensation risk, and employee outcomes have either focused on the role of risk aversion in shaping attitudes toward variable pay, or on the relation between variable pay and worker outcomes. Our paper is the first study to link these two branches of the literature by examining how a preference-compensation risk match influences worker outcomes. Our primary finding is that a match between the worker's risk preferences and the extent of risk in his or her compensation increases motivation, job satisfaction, company attachment and loyalty, though the risk-averse are generally less responsive to a preference-compensation match than the risk-loving. We also find that the risk-averse are generally less negatively affected by a preference-compensation mismatch than the risk-loving, and shared capitalism is linked to improving numerous worker outcomes even among the risk-averse. These results suggest that even risk-averse workers do not react badly, and in many cases may respond positively, to having at least a portion of their pay comprised of variable pay despite the fact that it introduces risk into their compensation.

Thus our findings shed a favorable light upon variable pay and employee ownership. One of the common criticisms made against employee ownership is that it has the downside of

imposing compensation risk onto workers, but our results suggest that this may not reduce worker utility as standard theories would predict. We therefore view our results as a valuable contribution to the employee ownership literature, enabling us to update our beliefs on how workers react to employee ownership.

The General Social Survey of 2006 shows that 46.7 percent of workers in the private sector workforce have some combination of profit or gain sharing, employee stock ownership or employee stock options. Indeed, almost half, 48.6 percent, of for-profit companies have one or more of these shared capitalist practices that provide workers with income based on the performance of the underlying capital of firms, and 62.6 percent of workers in corporations with stock have one or more of these practices. These levels of incidence demonstrate that the NBER Shared Capitalism Data which our analysis is based on does not merely reflect information on a small niche but a meaningful sector within the economy. Furthermore, while inflation-adjusted wages have been relatively flat since the 1980s, capital income has been shown to play an important role in increasing inflation-adjusted family wealth (Mishel, Bernstein, and Shierholz, 2009). We therefore view further study of shared capitalist practices to be a subject that merits continued research.

ENDNOTES

¹ The wording of the survey question is: “Some people like to take risks and others dislike taking risks. Where would you place yourself on a scale of how much you like or dislike taking risks, where 0 is hating to take any kind of risk and 10 is loving to take risks?”

² This variable is constructed as the ratio of two variables BONVAL, which indicates the total dollar value of performance-based payments in the previous year including profit-sharing, individual-based, workgroup-based or department-based performance bonuses, and BASEPAY, which indicates the worker’s annual base pay the previous year excluding overtime, bonuses and commissions.

³ Later in the paper as a robustness check we also investigate an alternative compensation risk variable that includes further measures of employee ownership like stock and option holdings. However, we prefer COMPRISK and treat it as our main compensation risk variable because it is a sharper measure of the share of salary comprised of variable pay in a given year (while the alternative measure includes cumulative forms of employee equity participation that have been amassed over multiple years) and workers have no choice over the portion of salary comprised of profit sharing and bonuses captured in COMPRISK (while some components of the alternative measure are subject to employee choice in a number of firms in the NBER Survey creating potential endogeneity bias in the regression estimates). Our key regression results are robust to using the alternative compensation risk measure.

⁴ We also tried dividing the distribution of COMPRISK into three at the 33rd and 66th percentiles, and LOVERISK into three at 4 and 7, defining MATCH, HIGHMATCH and LOWMATCH similarly, but also defining MIDMATCH to indicate match in the center of the two distributions. The regression results were qualitatively very similar.

⁵ This variable is constructed from the NBER Shard Capitalism Survey's variables as $(\text{BONVAL} + \text{EOVAL2} + \text{SOVAL}) / \text{BASEPAY}$.

⁶ COMPRISK1 equals 5 percent at the 25th percentile, 35 percent at the 50th percentile, and 123 percent at the 75th percentile of its distribution. Thirty-nine percent of workers have a high preference for risk and a high level of compensation risk ($\text{HIGHMATCH1}=1$), 14 percent have a low preference for risk and low compensation risk ($\text{LOWMATCH1}=1$), 36 percent have a high preference for risk but low compensation risk ($\text{NOMATCH101}=1$), and the remaining 11 percent of workers have a low preference for risk but high compensation risk ($\text{NOMATCH011}=1$).

⁷ We re-estimated the regressions in Tables 5-7 using the subset of seven firms in the NBER Survey where the workers had no choice over their variable pay to get around the endogeneity of COMPRISK1 , but the regression sample sizes were much smaller than the samples sizes in Tables 5-7 resulting in low precision in the estimates (these were some of the smaller firms in the NBER Survey). The coefficient estimates that were statistically significant, however, were larger in magnitude than both the estimates using COMPRISK1 in Tables 5-7 and the estimates using COMPRISK in Tables 2-4, suggesting that workers who have choice over the portion of pay that is variable are more responsive to a preference-compensation match, consistent with our earlier finding that the estimates of interest in the COMPRISK regressions in Tables 2-4 were found to be larger in magnitude than the COMPRISK1 results in Tables 5-7 also suggesting that choice leads to greater responsiveness to a match. These auxiliary regression results are available from the authors.

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TABLES

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Obs
loverisk	5.60	2.44	0	10	41,695
comprisk	0.13	0.88	0	125	27,437
daysabs	1.73	7.41	0	180	44,651
lookhard	1.57	0.83	1	4	46,202
motivation	4.02	0.90	1	5	45,832
jobsatisfac	5.03	1.30	1	7	43,413
longtime	0.82	0.39	0	1	46,061
loyal	3.33	0.80	1	4	42,350
suggestions	2.22	0.84	1	5	33,423
match	0.54	0.50	0	1	27,134
highmatch	0.40	0.49	0	1	27,134
lowmatch	0.14	0.35	0	1	27,134
nomatch	0.46	0.50	0	1	27,134
nomatch10	0.36	0.48	0	1	27,134
nomatch01	0.10	0.30	0	1	27,134
age	40.93	10.50	16	84	36,791
female	0.31	0.46	0	1	38,325
union	0.12	0.32	0	1	46,269
tenure	9.54	8.98	0	51.08	45,755
basepay	54,820.22	41,997.23	600	1,000,000	30,457
hours	45.79	8.14	0	100	45,696
atmkt	0.59	0.49	0	1	36,236
<i>Ethnicity:</i>					
white	0.77	0.42	0	1	36,061
hispanic	0.07	0.26	0	1	36,061
black	0.05	0.21	0	1	36,061
asian	0.08	0.27	0	1	36,061
native american	0.01	0.11	0	1	36,061
other	0.02	0.15	0	1	36,061
<i>Education:</i>					
no high school	0.04	0.19	0	1	35,758
high school	0.23	0.42	0	1	35,758
some college	0.22	0.41	0	1	35,758
associate degree	0.08	0.28	0	1	35,758
college	0.28	0.45	0	1	35,758
graduate school	0.14	0.34	0	1	39,436
<i>Occupation:</i>					
production	0.43	0.50	0	1	45,816
administrative support	0.06	0.24	0	1	45,816
professional and technical	0.30	0.46	0	1	45,816
sales	0.06	0.23	0	1	45,816
customer service	0.03	0.17	0	1	45,800
management	0.13	0.33	0	1	45,816

Note: Based on the NBER Shared Capitalism Survey of N = 46,907 workers.

Table 2: Effect of MATCH (against omitted base group NOMATCH) on Worker Outcomes (using compensation risk variable COMPRISK)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
match	-0.642*** (0.230)	-0.030** (0.012)	0.038*** (0.013)	0.075*** (0.019)	0.014** (0.006)	0.063*** (0.012)	-0.021 (0.013)
age	-0.078*** (0.014)	-0.009*** (0.001)	0.004*** (0.001)	0.008*** (0.001)	0.000 (0.000)	0.008*** (0.001)	-0.004*** (0.001)
female	2.818*** (0.320)	-0.092*** (0.014)	0.077*** (0.015)	0.109*** (0.021)	0.020*** (0.006)	0.100*** (0.013)	-0.119*** (0.014)
union	0.549 (0.660)	0.266*** (0.036)	-0.117*** (0.036)	-0.191*** (0.052)	-0.086*** (0.015)	-0.134*** (0.033)	0.010 (0.030)
tenure	-0.006 (0.015)	-0.005*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	0.001** (0.000)	-0.000 (0.001)	0.003*** (0.001)
basepay	0.000 (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)
hours	-0.160*** (0.020)	0.002** (0.001)	0.008*** (0.001)	0.005*** (0.001)	0.001** (0.000)	0.006*** (0.001)	0.008*** (0.001)
atmkt	-0.798*** (0.231)	-0.278*** (0.012)	0.181*** (0.013)	0.449*** (0.019)	0.092*** (0.006)	0.245*** (0.011)	-0.030** (0.013)
<i>Ethnicity:</i>							
hispanic	-1.389*** (0.458)	0.025 (0.028)	0.168*** (0.029)	0.225*** (0.045)	-0.034** (0.013)	0.123*** (0.025)	0.066* (0.035)
black	-0.626 (0.582)	0.170*** (0.036)	0.159*** (0.036)	0.061 (0.052)	-0.045*** (0.015)	-0.103*** (0.032)	-0.182*** (0.030)
asian	-3.266*** (0.453)	0.017 (0.022)	0.224*** (0.022)	0.017 (0.032)	-0.033*** (0.010)	0.054*** (0.019)	-0.021 (0.036)
native american	0.515 (1.102)	-0.003 (0.059)	0.087 (0.067)	0.131 (0.093)	-0.040 (0.029)	-0.030 (0.057)	-0.068 (0.054)
other	-0.425 (0.766)	0.160*** (0.050)	0.046 (0.045)	-0.082 (0.063)	-0.057*** (0.021)	0.019 (0.040)	0.050 (0.059)
<i>Education:</i>							
high school	-0.155 (0.840)	-0.048 (0.040)	-0.033 (0.046)	0.021 (0.071)	0.027* (0.016)	-0.012 (0.040)	-0.044 (0.040)
some college	0.806 (0.844)	0.051 (0.040)	-0.022 (0.046)	-0.122* (0.071)	0.003 (0.017)	-0.002 (0.039)	0.053 (0.041)
associate degree	-0.779 (0.876)	0.095** (0.043)	-0.041 (0.049)	-0.195*** (0.075)	-0.031 (0.020)	-0.023 (0.042)	0.060 (0.043)
college	-1.414* (0.853)	0.128*** (0.041)	-0.058 (0.047)	-0.223*** (0.072)	-0.035* (0.019)	-0.030 (0.040)	0.154*** (0.043)
graduate school	-2.284** (0.902)	0.149*** (0.043)	-0.077 (0.049)	-0.227*** (0.074)	-0.058*** (0.021)	-0.025 (0.041)	0.175*** (0.048)
<i>Occupation:</i>							
administrative support	-1.539*** (0.545)	-0.151*** (0.030)	0.296*** (0.030)	0.269*** (0.048)	0.046*** (0.011)	0.327*** (0.026)	-0.005 (0.024)
professional and technical	-0.537 (0.333)	-0.132*** (0.019)	0.227*** (0.020)	0.253*** (0.028)	0.040*** (0.008)	0.293*** (0.017)	0.089*** (0.020)
sales	-3.412*** (0.511)	-0.237*** (0.025)	0.300*** (0.027)	0.439*** (0.039)	0.070*** (0.009)	0.450*** (0.022)	-0.052* (0.028)
customer service	-0.840 (0.616)	-0.136*** (0.037)	0.316*** (0.040)	0.030 (0.062)	0.027* (0.015)	0.298*** (0.035)	0.067** (0.032)
management	-1.935*** (0.399)	-0.196*** (0.022)	0.366*** (0.024)	0.422*** (0.034)	0.068*** (0.008)	0.432*** (0.020)	0.455*** (0.028)
Constant	6.713*** (1.209)	2.146*** (0.062)	3.214*** (0.066)	4.071*** (0.099)	•	2.367*** (0.057)	1.901*** (0.068)
Observations	19218	19566	19594	19618	19571	19307	13904
Pseudo R-squared	0.013	•	•	•	0.053	•	•
Adjusted R-squared	•	0.074	0.081	0.066	•	0.114	0.122

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit, and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group is WHITE, the omitted category for the education dummy variable group is NO HIGH SCHOOL, the omitted category for the occupation dummy variable group is PRODUCTION.

Table 3: Effect of HIGHMATCH and LOWMATCH (against omitted base group NOMATCH) on Worker Outcomes (using compensation risk variable COMPRISK)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
highmatch	-0.645** (0.261)	-0.010 (0.014)	0.090*** (0.015)	0.094*** (0.021)	0.015** (0.006)	0.094*** (0.013)	0.065*** (0.016)
lowmatch	-0.637* (0.332)	-0.071*** (0.018)	-0.070*** (0.020)	0.034 (0.029)	0.011 (0.008)	-0.002 (0.018)	-0.136*** (0.016)
age	-0.078*** (0.014)	-0.009*** (0.001)	0.004*** (0.001)	0.008*** (0.001)	0.000 (0.000)	0.008*** (0.001)	-0.004*** (0.001)
female	2.817*** (0.324)	-0.087*** (0.014)	0.088*** (0.015)	0.114*** (0.021)	0.020*** (0.006)	0.107*** (0.013)	-0.103*** (0.015)
union	0.549 (0.662)	0.269*** (0.036)	-0.110*** (0.036)	-0.188*** (0.052)	-0.086*** (0.015)	-0.129*** (0.033)	0.021 (0.030)
tenure	-0.006 (0.015)	-0.004*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	0.001** (0.000)	-0.000 (0.001)	0.003*** (0.001)
basepay	0.000 (0.000)	-0.000* (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)
hours	-0.160*** (0.020)	0.002** (0.001)	0.008*** (0.001)	0.005*** (0.001)	0.001** (0.000)	0.005*** (0.001)	0.008*** (0.001)
atmkt	-0.798*** (0.231)	-0.278*** (0.012)	0.181*** (0.013)	0.448*** (0.019)	0.092*** (0.006)	0.245*** (0.011)	-0.029** (0.013)
<i>Ethnicity:</i>							
hispanic	-1.389*** (0.458)	0.024 (0.028)	0.165*** (0.029)	0.224*** (0.045)	-0.034** (0.013)	0.121*** (0.025)	0.059* (0.035)
black	-0.626 (0.583)	0.169*** (0.036)	0.156*** (0.036)	0.060 (0.053)	-0.045*** (0.015)	-0.104*** (0.032)	-0.186*** (0.030)
asian	-3.265*** (0.454)	0.014 (0.022)	0.214*** (0.022)	0.013 (0.032)	-0.034*** (0.010)	0.047** (0.019)	-0.037 (0.036)
native american	0.515 (1.101)	-0.002 (0.059)	0.090 (0.068)	0.131 (0.093)	-0.040 (0.029)	-0.030 (0.057)	-0.064 (0.054)
other	-0.424 (0.766)	0.157*** (0.050)	0.040 (0.045)	-0.084 (0.063)	-0.057*** (0.021)	0.016 (0.040)	0.045 (0.059)
<i>Education:</i>							
high school	-0.155 (0.840)	-0.048 (0.040)	-0.033 (0.046)	0.021 (0.071)	0.027* (0.016)	-0.012 (0.040)	-0.045 (0.040)
some college	0.806 (0.844)	0.047 (0.040)	-0.032 (0.046)	-0.126* (0.071)	0.003 (0.017)	-0.008 (0.039)	0.040 (0.040)
associate degree	-0.779 (0.878)	0.091** (0.043)	-0.053 (0.049)	-0.199*** (0.075)	-0.031 (0.020)	-0.029 (0.042)	0.044 (0.043)
college	-1.413* (0.856)	0.121*** (0.041)	-0.076 (0.047)	-0.230*** (0.072)	-0.035* (0.019)	-0.041 (0.040)	0.129*** (0.043)
graduate school	-2.283** (0.905)	0.142*** (0.043)	-0.095** (0.049)	-0.234*** (0.074)	-0.058*** (0.022)	-0.036 (0.041)	0.153*** (0.048)
<i>Occupation:</i>							
administrative support	-1.538*** (0.546)	-0.154*** (0.030)	0.288*** (0.030)	0.267*** (0.048)	0.046*** (0.011)	0.322*** (0.026)	-0.011 (0.024)
professional and technical	-0.536 (0.340)	-0.140*** (0.019)	0.207*** (0.020)	0.245*** (0.029)	0.039*** (0.008)	0.281*** (0.018)	0.073*** (0.020)
sales	-3.410*** (0.522)	-0.249*** (0.026)	0.269*** (0.027)	0.427*** (0.040)	0.070*** (0.009)	0.431*** (0.022)	-0.096*** (0.028)
customer service	-0.839 (0.616)	-0.137*** (0.037)	0.313*** (0.039)	0.029 (0.061)	0.027* (0.015)	0.296*** (0.035)	0.063* (0.032)
management	-1.934*** (0.407)	-0.205*** (0.022)	0.342*** (0.024)	0.413*** (0.035)	0.067*** (0.008)	0.417*** (0.020)	0.422*** (0.028)
Constant	6.711*** (1.216)	2.161*** (0.062)	3.256*** (0.067)	4.086*** (0.099)	• (0.053)	2.392*** (0.057)	1.948*** (0.068)
Observations	19218	19566	19594	19618	19571	19307	13904
Pseudo R-squared	0.013	•	•	•	0.053	•	•
Adjusted R-squared	•	0.074	0.084	0.066	•	0.115	0.128

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit., and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group is WHITE, the omitted category for the education dummy variable group is NO HIGH SCHOOL, the omitted category for the occupation dummy variable group is PRODUCTION.

Table 4: In the subsample of workers with NOMATCH=1 (i.e., MATCH=0), Effect of NOMATCH10 (against omitted base group NOMATCH01) on Worker Outcomes (using compensation risk variable COMPRISK)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
nomatch10	-0.111 (0.414)	0.178*** (0.022)	0.045* (0.023)	-0.110*** (0.034)	-0.062*** (0.010)	-0.097*** (0.021)	0.128*** (0.022)
age	-0.091*** (0.022)	-0.010*** (0.001)	0.005*** (0.001)	0.008*** (0.002)	0.001* (0.000)	0.009*** (0.001)	-0.003*** (0.001)
female	3.198*** (0.517)	-0.102*** (0.021)	0.132*** (0.021)	0.154*** (0.032)	0.033*** (0.009)	0.148*** (0.019)	-0.110*** (0.020)
union	0.909 (0.925)	0.175*** (0.042)	-0.103** (0.043)	-0.165*** (0.064)	-0.059*** (0.019)	-0.119*** (0.039)	0.012 (0.036)
tenure	-0.023 (0.028)	-0.004*** (0.001)	-0.007*** (0.001)	-0.007*** (0.002)	0.001 (0.001)	-0.001 (0.001)	0.004*** (0.001)
basepay	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)
hours	-0.139*** (0.037)	0.002* (0.001)	0.006*** (0.001)	0.002 (0.002)	0.001* (0.001)	0.005*** (0.001)	0.007*** (0.001)
atmkt	-0.604 (0.395)	-0.291*** (0.019)	0.182*** (0.020)	0.464*** (0.029)	0.098*** (0.009)	0.266*** (0.018)	-0.048*** (0.018)
<i>Ethnicity:</i>							
hispanic	-1.720** (0.785)	0.022 (0.042)	0.205*** (0.045)	0.277*** (0.069)	-0.008 (0.020)	0.142*** (0.040)	0.094** (0.047)
black	-0.154 (0.909)	0.192*** (0.048)	0.151*** (0.048)	0.068 (0.071)	-0.040* (0.021)	-0.126*** (0.044)	-0.155*** (0.039)
asian	-6.438*** (0.913)	0.052 (0.038)	0.318*** (0.038)	-0.020 (0.060)	-0.045** (0.019)	0.039 (0.035)	-0.001 (0.051)
native american	-1.559 (1.496)	-0.014 (0.080)	0.139* (0.082)	0.133 (0.120)	-0.043 (0.041)	-0.032 (0.075)	-0.052 (0.071)
other	0.566 (1.527)	0.113 (0.088)	0.078 (0.071)	0.000 (0.107)	-0.036 (0.035)	0.100 (0.071)	0.048 (0.076)
<i>Education:</i>							
high school	-0.665 (1.436)	-0.075 (0.056)	0.011 (0.065)	0.050 (0.102)	0.037 (0.024)	0.064 (0.059)	-0.082 (0.057)
some college	0.806 (1.446)	0.017 (0.056)	0.024 (0.065)	-0.114 (0.102)	0.016 (0.025)	0.080 (0.059)	0.028 (0.057)
associate degree	-1.313 (1.520)	0.097 (0.062)	0.008 (0.069)	-0.154 (0.109)	-0.032 (0.030)	0.052 (0.063)	0.030 (0.062)
college	-1.679 (1.493)	0.117* (0.060)	-0.067 (0.068)	-0.224** (0.106)	-0.048 (0.029)	0.034 (0.062)	0.125** (0.061)
graduate school	-2.666 (1.655)	0.101 (0.064)	-0.093 (0.072)	-0.196* (0.112)	-0.055 (0.034)	0.028 (0.065)	0.112* (0.068)
<i>Occupation:</i>							
administrative support	-1.353 (0.889)	-0.118*** (0.041)	0.226*** (0.042)	0.176*** (0.067)	0.039** (0.018)	0.243*** (0.037)	0.015 (0.034)
professional and technical	-0.703 (0.581)	-0.100*** (0.029)	0.216*** (0.029)	0.231*** (0.043)	0.027** (0.013)	0.261*** (0.027)	0.069** (0.027)
sales	-4.126*** (0.922)	-0.213*** (0.046)	0.296*** (0.049)	0.367*** (0.075)	0.070*** (0.017)	0.494*** (0.038)	-0.072* (0.042)
customer service	-1.231 (0.791)	-0.155*** (0.047)	0.320*** (0.049)	0.062 (0.079)	0.055*** (0.020)	0.301*** (0.045)	0.041 (0.043)
management	-2.655*** (0.708)	-0.214*** (0.035)	0.392*** (0.036)	0.461*** (0.054)	0.089*** (0.013)	0.443*** (0.032)	0.428*** (0.041)
Constant	5.645*** (2.105)	2.007*** (0.096)	3.196*** (0.102)	4.277*** (0.153)	• (0.093)	2.378*** (0.093)	1.834*** (0.098)
Observations	8237	8387	8386	8408	8379	8258	7209
Pseudo R-squared	0.009	•	•	•	0.053	•	•
Adjusted R-Squared	•	0.085	0.058	0.056	•	0.102	0.083

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit., and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group is WHITE, the omitted category for the education dummy variable group is NO HIGH SCHOOL, the omitted category for the occupation dummy variable group is PRODUCTION.

Table 5: Effect of MATCH1 (against omitted base group NOMATCH1) on Worker Outcomes (using compensation risk variable COMPRISK1)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
match1	-0.386* (0.223)	-0.025** (0.012)	0.026** (0.013)	0.065*** (0.019)	0.012** (0.006)	0.059*** (0.011)	-0.053*** (0.013)
age	-0.079*** (0.014)	-0.009*** (0.001)	0.004*** (0.001)	0.008*** (0.001)	0.000 (0.000)	0.008*** (0.001)	-0.004*** (0.001)
female	2.820*** (0.323)	-0.091*** (0.014)	0.080*** (0.015)	0.108*** (0.021)	0.020*** (0.006)	0.102*** (0.013)	-0.122*** (0.015)
union	0.494 (0.661)	0.269*** (0.036)	-0.125*** (0.036)	-0.197*** (0.052)	-0.087*** (0.015)	-0.138*** (0.033)	0.009 (0.030)
tenure	-0.003 (0.015)	-0.004*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	0.001** (0.000)	-0.001 (0.001)	0.003*** (0.001)
basepay	0.000 (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000* (0.000)	0.000*** (0.000)
hours	-0.160*** (0.020)	0.002** (0.001)	0.008*** (0.001)	0.005*** (0.001)	0.001** (0.000)	0.006*** (0.001)	0.008*** (0.001)
atmkt	-0.787*** (0.232)	-0.277*** (0.013)	0.180*** (0.013)	0.451*** (0.019)	0.092*** (0.006)	0.245*** (0.011)	-0.032** (0.013)
<i>Ethnicity:</i>							
hispanic	-1.376*** (0.461)	0.027 (0.029)	0.166*** (0.030)	0.225*** (0.046)	-0.035*** (0.013)	0.124*** (0.026)	0.058* (0.035)
black	-0.574 (0.587)	0.171*** (0.036)	0.163*** (0.036)	0.057 (0.053)	-0.046*** (0.015)	-0.106*** (0.032)	-0.180*** (0.030)
asian	-3.271*** (0.458)	0.018 (0.022)	0.228*** (0.022)	0.021 (0.032)	-0.034*** (0.010)	0.057*** (0.019)	-0.029 (0.036)
native american	0.541 (1.100)	0.000 (0.059)	0.088 (0.068)	0.131 (0.093)	-0.041 (0.029)	-0.036 (0.057)	-0.062 (0.054)
other	-0.373 (0.769)	0.164*** (0.050)	0.052 (0.045)	-0.085 (0.064)	-0.058*** (0.021)	0.017 (0.040)	0.054 (0.060)
<i>Education:</i>							
high school	-0.046 (0.845)	-0.052 (0.040)	-0.036 (0.047)	0.020 (0.072)	0.025 (0.016)	-0.018 (0.039)	-0.045 (0.040)
some college	0.893 (0.849)	0.050 (0.040)	-0.025 (0.046)	-0.126* (0.071)	0.001 (0.017)	-0.010 (0.039)	0.051 (0.041)
associate degree	-0.711 (0.882)	0.091** (0.043)	-0.038 (0.049)	-0.202*** (0.075)	-0.032 (0.021)	-0.028 (0.042)	0.058 (0.044)
college	-1.402 (0.859)	0.126*** (0.041)	-0.058 (0.047)	-0.227*** (0.072)	-0.037* (0.019)	-0.034 (0.040)	0.149*** (0.043)
graduate school	-2.242** (0.908)	0.148*** (0.043)	-0.074 (0.049)	-0.230*** (0.075)	-0.060*** (0.022)	-0.028 (0.041)	0.172*** (0.048)
<i>Occupation:</i>							
administrative support	-1.617*** (0.551)	-0.149*** (0.030)	0.290*** (0.030)	0.288*** (0.048)	0.046*** (0.011)	0.328*** (0.027)	-0.002 (0.024)
professional and technical	-0.616* (0.334)	-0.136*** (0.019)	0.228*** (0.020)	0.259*** (0.029)	0.041*** (0.008)	0.295*** (0.017)	0.085*** (0.020)
sales	-3.457*** (0.518)	-0.242*** (0.025)	0.300*** (0.027)	0.450*** (0.039)	0.071*** (0.009)	0.455*** (0.022)	-0.053* (0.028)
customer service	-0.933 (0.620)	-0.136*** (0.037)	0.313*** (0.040)	0.033 (0.062)	0.028* (0.015)	0.303*** (0.035)	0.067** (0.033)
management	-1.990*** (0.402)	-0.201*** (0.022)	0.368*** (0.024)	0.430*** (0.034)	0.069*** (0.008)	0.440*** (0.020)	0.454*** (0.029)
Constant	6.605*** (1.214)	2.144*** (0.062)	3.234*** (0.066)	4.080*** (0.100)	• (0.058)	2.381*** (0.058)	1.916*** (0.068)
Observations	18974	19318	19346	19371	19324	19065	13732
Pseudo R-squared	0.013	•	•	•	0.053	•	•
Adjusted R-squared	•	0.074	0.081	0.066	•	0.114	0.122

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit., and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group is WHITE, the omitted category for the education dummy variable group is NO HIGH SCHOOL, the omitted category for the occupation dummy variable group is PRODUCTION.

Table 6: Effect of HIGHMATCH1 and LOWMATCH1 (against omitted base group NOMATCH1) on Worker Outcomes (using compensation risk variable COMPRISK1)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
highmatch1	-0.460* (0.257)	0.001 (0.014)	0.077*** (0.014)	0.091*** (0.021)	0.013** (0.006)	0.091*** (0.013)	0.027* (0.016)
lowmatch1	-0.242 (0.326)	-0.083*** (0.019)	-0.088*** (0.020)	0.004 (0.029)	0.009 (0.008)	-0.014 (0.018)	-0.158*** (0.016)
age	-0.079*** (0.014)	-0.009*** (0.001)	0.004*** (0.001)	0.008*** (0.001)	0.000 (0.000)	0.008*** (0.001)	-0.004*** (0.001)
female	2.807*** (0.327)	-0.086*** (0.014)	0.089*** (0.015)	0.113*** (0.021)	0.021*** (0.006)	0.108*** (0.013)	-0.109*** (0.015)
union	0.477 (0.664)	0.276*** (0.036)	-0.112*** (0.036)	-0.190*** (0.052)	-0.087*** (0.015)	-0.130*** (0.033)	0.024 (0.030)
tenure	-0.002 (0.015)	-0.005*** (0.001)	-0.007*** (0.001)	-0.007*** (0.001)	0.001** (0.000)	-0.001 (0.001)	0.002*** (0.001)
basepay	0.000 (0.000)	-0.000** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)
hours	-0.160*** (0.020)	0.002** (0.001)	0.008*** (0.001)	0.004*** (0.001)	0.001** (0.000)	0.005*** (0.001)	0.008*** (0.001)
atmkt	-0.785*** (0.232)	-0.278*** (0.013)	0.178*** (0.013)	0.450*** (0.019)	0.092*** (0.006)	0.243*** (0.011)	-0.032** (0.013)
<i>Ethnicity:</i>							
hispanic	-1.376*** (0.461)	0.027 (0.029)	0.166*** (0.030)	0.225*** (0.046)	-0.035*** (0.013)	0.124*** (0.026)	0.058* (0.035)
black	-0.570 (0.587)	0.170*** (0.036)	0.161*** (0.036)	0.056 (0.053)	-0.046*** (0.015)	-0.107*** (0.032)	-0.185*** (0.030)
asian	-3.254*** (0.461)	0.012 (0.022)	0.217*** (0.022)	0.015 (0.032)	-0.034*** (0.010)	0.050*** (0.019)	-0.033 (0.036)
native american	0.542 (1.100)	-0.000 (0.059)	0.087 (0.068)	0.130 (0.093)	-0.041 (0.029)	-0.038 (0.057)	-0.063 (0.054)
other	-0.363 (0.769)	0.160*** (0.050)	0.044 (0.045)	-0.089 (0.064)	-0.058*** (0.021)	0.012 (0.040)	0.050 (0.060)
<i>Education:</i>							
high school	-0.041 (0.846)	-0.053 (0.040)	-0.040 (0.047)	0.018 (0.072)	0.025 (0.016)	-0.020 (0.040)	-0.050 (0.041)
some college	0.908 (0.850)	0.045 (0.040)	-0.036 (0.046)	-0.132* (0.071)	0.001 (0.017)	-0.017 (0.039)	0.037 (0.041)
associate degree	-0.695 (0.883)	0.086** (0.043)	-0.050 (0.049)	-0.208*** (0.075)	-0.032 (0.021)	-0.035 (0.042)	0.043 (0.044)
college	-1.384 (0.861)	0.119*** (0.041)	-0.072 (0.047)	-0.234*** (0.072)	-0.037* (0.019)	-0.043 (0.040)	0.134*** (0.043)
graduate school	-2.223** (0.910)	0.140*** (0.043)	-0.089* (0.049)	-0.238*** (0.075)	-0.060*** (0.022)	-0.038 (0.041)	0.158*** (0.048)
<i>Occupation:</i>							
administrative support	-1.603*** (0.553)	-0.154*** (0.030)	0.280*** (0.030)	0.283*** (0.048)	0.046*** (0.011)	0.322*** (0.027)	-0.008 (0.024)
professional and technical	-0.593* (0.338)	-0.145*** (0.019)	0.210*** (0.020)	0.249*** (0.029)	0.041*** (0.008)	0.283*** (0.018)	0.076*** (0.020)
sales	-3.420*** (0.530)	-0.256*** (0.026)	0.272*** (0.027)	0.435*** (0.040)	0.071*** (0.009)	0.437*** (0.022)	-0.080*** (0.028)
customer service	-0.932 (0.620)	-0.136*** (0.037)	0.312*** (0.040)	0.033 (0.062)	0.028* (0.015)	0.303*** (0.035)	0.065** (0.032)
management	-1.969*** (0.407)	-0.210*** (0.022)	0.351*** (0.024)	0.421*** (0.035)	0.069*** (0.008)	0.429*** (0.020)	0.432*** (0.028)
Constant	6.536*** (1.221)	2.170*** (0.062)	3.286*** (0.067)	4.107*** (0.100)	•	2.414*** (0.058)	1.962*** (0.068)
Observations	18974	19318	19346	19371	19324	19065	13732
Pseudo R-squared	0.013	•	•	•	0.053	•	•
Adjusted R-squared	•	0.075	0.083	0.066	•	0.115	0.127

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit., and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group is WHITE, the omitted category for the education dummy variable group is NO HIGH SCHOOL, the omitted category for the occupation dummy variable group is PRODUCTION.

Table 7: In the subsample of workers with NOMATCH1=1 (i.e., MATCH1=0), Effect of NOMATCH10 (against omitted base group NOMATCH011) on Worker Outcomes (using compensation risk variable COMPRISK1)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
nomatch101	-0.036 (0.404)	0.130*** (0.020)	0.013 (0.021)	-0.075** (0.032)	-0.039*** (0.010)	-0.084*** (0.019)	0.068*** (0.019)
age	-0.093*** (0.022)	-0.009*** (0.001)	0.005*** (0.001)	0.008*** (0.002)	0.001* (0.000)	0.009*** (0.001)	-0.003*** (0.001)
female	3.190*** (0.517)	-0.107*** (0.021)	0.129*** (0.021)	0.156*** (0.032)	0.035*** (0.009)	0.150*** (0.019)	-0.121*** (0.020)
union	0.812 (0.928)	0.161*** (0.042)	-0.105** (0.043)	-0.158** (0.064)	-0.055*** (0.019)	-0.108*** (0.040)	0.010 (0.037)
tenure	-0.021 (0.028)	-0.003*** (0.001)	-0.007*** (0.001)	-0.008*** (0.002)	0.000 (0.001)	-0.002* (0.001)	0.004*** (0.001)
basepay	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)
hours	-0.142*** (0.037)	0.003** (0.001)	0.006*** (0.001)	0.002 (0.002)	0.001 (0.001)	0.004*** (0.001)	0.007*** (0.001)
atmkt	-0.574 (0.392)	-0.298*** (0.020)	0.181*** (0.020)	0.471*** (0.029)	0.101*** (0.009)	0.269*** (0.018)	-0.048*** (0.018)
<i>Ethnicity:</i>							
hispanic	-1.678** (0.792)	0.021 (0.043)	0.202*** (0.045)	0.276*** (0.070)	-0.009 (0.020)	0.144*** (0.041)	0.092* (0.047)
black	-0.166 (0.914)	0.200*** (0.048)	0.153*** (0.048)	0.063 (0.071)	-0.042** (0.021)	-0.129*** (0.044)	-0.152*** (0.039)
asian	-6.368*** (0.912)	0.057 (0.038)	0.316*** (0.038)	-0.021 (0.060)	-0.046** (0.019)	0.039 (0.035)	-0.004 (0.051)
native american	-1.539 (1.494)	-0.007 (0.081)	0.143* (0.083)	0.137 (0.121)	-0.043 (0.041)	-0.037 (0.075)	-0.043 (0.071)
other	0.621 (1.527)	0.121 (0.088)	0.070 (0.072)	-0.000 (0.108)	-0.038 (0.035)	0.095 (0.071)	0.056 (0.077)
<i>Education:</i>							
high school	-0.588 (1.435)	-0.068 (0.056)	0.011 (0.065)	0.041 (0.102)	0.034 (0.024)	0.059 (0.059)	-0.078 (0.057)
some college	0.828 (1.447)	0.026 (0.056)	0.025 (0.065)	-0.121 (0.102)	0.013 (0.025)	0.072 (0.059)	0.030 (0.057)
associate degree	-1.252 (1.517)	0.104* (0.062)	0.011 (0.069)	-0.165 (0.109)	-0.034 (0.031)	0.046 (0.064)	0.032 (0.061)
college	-1.742 (1.494)	0.115* (0.060)	-0.067 (0.068)	-0.231** (0.106)	-0.047 (0.030)	0.030 (0.062)	0.117* (0.061)
graduate school	-2.574 (1.653)	0.093 (0.065)	-0.091 (0.072)	-0.197* (0.112)	-0.054 (0.034)	0.027 (0.066)	0.099 (0.068)
<i>Occupation:</i>							
administrative support	-1.407 (0.897)	-0.119*** (0.042)	0.219*** (0.042)	0.190*** (0.067)	0.040** (0.018)	0.249*** (0.037)	0.015 (0.034)
professional and technical	-0.817 (0.579)	-0.111*** (0.029)	0.207*** (0.030)	0.243*** (0.044)	0.031** (0.013)	0.264*** (0.027)	0.066** (0.028)
sales	-4.253*** (0.939)	-0.205*** (0.047)	0.291*** (0.050)	0.373*** (0.075)	0.069*** (0.018)	0.486*** (0.039)	-0.074* (0.043)
customer service	-1.430* (0.800)	-0.156*** (0.048)	0.322*** (0.050)	0.066 (0.080)	0.055*** (0.020)	0.310*** (0.046)	0.045 (0.043)
management	-2.643*** (0.708)	-0.222*** (0.035)	0.387*** (0.036)	0.473*** (0.054)	0.091*** (0.013)	0.450*** (0.032)	0.429*** (0.041)
Constant	5.813*** (2.093)	2.040*** (0.096)	3.256*** (0.102)	4.256*** (0.153)	•	2.390*** (0.093)	1.891*** (0.097)
Observations	8137	8287	8287	8309	8281	8160	7131
Pseudo R-squared	0.009	•	•	•	0.051	•	•
Adjusted R-squared	•	0.083	0.057	0.056	•	0.102	0.081

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit., and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group ETH_1, the omitted category for the education dummy variable group is NOHS, the omitted category for the occupation dummy variable group is PRDN.

APPENDIX

Table A: In the subsample of workers with low LOVERISK, Effect of NOMATCH01 (against omitted base group MATCH) on Worker Outcomes (using compensation risk variable COMPRISK)

	daysabs (1)	lookhard (2)	motivation (3)	jobsatisfac (4)	longtime (5)	loyal (6)	suggestions (7)
nomatch01	0.345 (0.404)	-0.043 (0.026)	0.047 (0.030)	0.031 (0.043)	0.023* (0.012)	0.067** (0.026)	0.052** (0.025)
age	-0.089*** (0.024)	-0.009*** (0.001)	0.004*** (0.001)	0.007*** (0.002)	-0.000 (0.001)	0.007*** (0.001)	-0.004*** (0.001)
female	2.383*** (0.435)	-0.077*** (0.024)	0.156*** (0.028)	0.112*** (0.039)	0.021* (0.011)	0.116*** (0.024)	-0.119*** (0.023)
union	-0.248 (0.819)	0.426*** (0.075)	-0.214*** (0.079)	-0.182* (0.107)	-0.134*** (0.033)	-0.202*** (0.068)	-0.076 (0.055)
tenure	0.003 (0.023)	-0.004*** (0.001)	-0.006*** (0.002)	-0.009*** (0.002)	0.001* (0.001)	0.000 (0.001)	0.004*** (0.001)
basepay	0.000 (0.000)	-0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000* (0.000)	-0.000 (0.000)	0.000 (0.000)
hours	-0.161*** (0.041)	0.001 (0.002)	0.008*** (0.002)	0.005* (0.003)	0.001 (0.001)	0.010*** (0.002)	0.006*** (0.002)
atmkt	-0.641 (0.399)	-0.262*** (0.024)	0.192*** (0.027)	0.447*** (0.038)	0.091*** (0.011)	0.267*** (0.024)	0.003 (0.022)
<i>Ethnicity:</i>							
hispanic	-0.758 (0.740)	-0.030 (0.059)	0.178*** (0.063)	0.190* (0.102)	-0.079** (0.032)	0.132** (0.056)	-0.013 (0.065)
black	-0.858 (0.788)	0.127* (0.067)	0.237*** (0.073)	-0.018 (0.110)	-0.035 (0.029)	-0.122* (0.064)	-0.158*** (0.055)
asian	-3.080*** (0.846)	0.094* (0.051)	0.292*** (0.056)	0.157* (0.081)	-0.054** (0.026)	0.124*** (0.044)	0.153 (0.099)
native american	2.698 (2.391)	-0.047 (0.089)	0.177 (0.121)	0.243 (0.178)	-0.045 (0.051)	0.067 (0.097)	0.059 (0.102)
other	-0.775 (1.064)	0.149 (0.119)	0.126 (0.109)	0.063 (0.163)	-0.026 (0.048)	-0.075 (0.104)	0.098 (0.112)
<i>Education:</i>							
high school	0.113 (0.964)	-0.039 (0.071)	-0.073 (0.081)	-0.055 (0.123)	0.006 (0.029)	-0.085 (0.069)	-0.022 (0.063)
some college	0.509 (0.961)	0.058 (0.074)	-0.005 (0.082)	-0.160 (0.125)	-0.019 (0.031)	-0.056 (0.071)	0.047 (0.064)
associate degree	-0.820 (1.016)	0.055 (0.079)	-0.034 (0.088)	-0.222* (0.134)	-0.017 (0.036)	-0.062 (0.077)	0.062 (0.070)
college	-1.112 (1.007)	0.081 (0.078)	-0.169** (0.086)	-0.238* (0.131)	-0.049 (0.036)	-0.096 (0.074)	0.067 (0.071)
graduate school	-1.933* (1.149)	0.067 (0.084)	-0.137 (0.093)	-0.208 (0.138)	-0.056 (0.042)	-0.095 (0.078)	0.076 (0.085)
<i>Occupation:</i>							
administrative support	-2.599*** (0.630)	-0.160*** (0.044)	0.304*** (0.049)	0.394*** (0.076)	0.079*** (0.015)	0.391*** (0.041)	0.039 (0.038)
professional and technical	-0.478 (0.572)	-0.088** (0.035)	0.227*** (0.040)	0.201*** (0.056)	0.048*** (0.015)	0.277*** (0.035)	0.111*** (0.035)
sales	-1.175 (1.319)	-0.158** (0.067)	0.255*** (0.076)	0.310*** (0.113)	0.055** (0.023)	0.417*** (0.056)	-0.084** (0.036)
customer service	-0.525 (0.951)	-0.077 (0.062)	0.212*** (0.075)	-0.183 (0.118)	0.023 (0.028)	0.219*** (0.065)	0.116** (0.053)
management	-1.095 (0.738)	-0.113** (0.048)	0.316*** (0.057)	0.294*** (0.084)	0.066*** (0.017)	0.369*** (0.047)	0.383*** (0.060)
Constant	7.362*** (2.127)	2.055*** (0.119)	3.158*** (0.136)	4.248*** (0.191)	• (0.054)	2.306*** (0.113)	1.879*** (0.122)
Observations	4573	4639	4635	4649	4632	4573	3652
Pseudo R-squared	0.009	•	•	•	0.054	•	•
Adjusted R-squared	•	0.079	0.069	0.050	•	0.106	0.082

Note: Equations are estimated using OLS except for the DAYSABS equation which is estimated using Tobit., and the LONGTIME equation which is estimated using Probit (with Probit marginal effects presented in table entries). Robust standard are in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively. The omitted category for the ethnicity dummy variable group is WHITE, the omitted category for the education dummy variable group is NO HIGH SCHOOL, the omitted category for the occupation dummy variable group is PRODUCTION.

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