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Keywords
employee, management, theory, organization, performance, risk, pay, incentive

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Abstract

In this study we extend agency based research by examining the role of risk in the structure of managerial compensation and its relationship to organization performance. Our results suggest that organizations facing higher risk do not place greater emphasis on short term incentives, they place less emphasis on it. Also, higher risk firms which rely on incentive pay exhibited poorer performance than high risk firms which de-emphasize incentive pay.

In recent years, agency theory has emerged as the principal theory guiding organizational research on the pay-performance relationship (e.g., Gerhart & Milkovich, 1990; Roth & O'Donnell, 1996; Stroh, Brett, Bauman, & Reilly, 1996). Agency theory deals with the problems of creating a contract governing the exchange between individuals who have divergent interests (Baiman, 1990; Eisenhardt, 1989; Jensen, 1983). In the employment relationship, the basic agency problem is characterized in terms of properly structuring monitoring and compensation systems to induce self-interested, utility maximizing, risk and effort averse agents (e.g., managers who want to maximize their compensation and minimize their effort expenditures) to act on the principal's (e.g., owners who want to increase the value and performance of their firm) behalf (Eisenhardt, 1989; Jensen & Meckling, 1976; Levinthal, 1988). Agency theory seeks to explain the choices principals make about the form and structure of compensation systems and how those choices are related to the principal's outcomes.

Classic definitions of agency theory posit that an optimal compensation system is contingent on the need to balance the agent's effort and risk aversion (Eisenhardt, 1990; Jensen, 1983; Levinthal, 1988). Agency theory is predicated on the assumption that people prefer to avoid both work and risk. Thus, the principal's choice is expected to account for these preferences, structuring compensation systems to induce people to work while at the same time minimizing, whenever possible, shifting too much risk on them. Although the classic definitions emphasize the importance of both effort and risk considerations, much of the agency-based compensation research has tended to overlook risk considerations (see Antle & Smith, 1986; Janakiraman, Lambert, & Larcker, 1992 for exceptions). This literature has focused almost exclusively on effort aversion, investigating the efficacy of incentive pay for aligning agents' behavior in various organizational contexts (Abowd, 1990; Gerhart & Milkovich, 1990; Gomez-Mejia & Balkin, 1992; Tosi & Gomez-Mejia, 1989). By under emphasizing the important role that risk plays in normative agency theory, this research may tell only part of the story about whether and when incentive compensation leads to positive organizational outcomes. The purpose of our study is to investigate whether risk influences the use of base and incentive compensation and whether risk moderates the relationship between incentive compensation and firm performance.

Recent research is bringing agency-based compensation research more into line with classic definitions by considering both risk and effort aversion. Stroh, et al., (1996) found that environmental turbulence, a concept closely connected to business risk, is negatively related to the use of incentive compensation. Zajac and Westphal (1994) found that the use of stock options is negatively related to three measures of business risk in a sample of Fortune 500

CEOs. In a study of smaller, emerging organizations (i.e., firms engaging in initial public offerings), Beatty and Zajac (1994) report that the use of incentive pay is influenced by risk considerations; higher risk IPOs tend to use stock-options less than lower risk companies. Although the purpose of their study was not to investigate the ultimate effects of risk on firm performance, Beatty and Zajac (1994) suggest their results affirm theoretical arguments about its importance in the pay-performance relation.

Our study contributes to this vein of agency research, and extends the work of Beatty and Zajac (1994), Stroh, et. al., (1996), and Zajac and Westphal (1994), in several ways. First, we examine whether the degree of risk organizations face moderates the incentive pay-organization performance relationship. Fundamentally, agency theory focuses on maximizing organization performance. Previous research has increased our understanding of the relationship between risk and the use of incentive pay among small organizations (Beatty & Zajac, 1994;) and CEOs (Zajac & Westphal, 1994). Our investigation provides evidence about the joint effects of risk and incentive pay on organization performance. Second, research provides limited information about whether agency theory can inform our understanding of compensation systems of non-CEO employees (Stroh, et al., 1996). Rather than focusing only on CEOs, our study investigates the efficacy of agency predictions for a set of mangers from each organization. This matters because the performance of an organization's entire management team is important for understanding organizational success (Hambrick & Mason, 1984). Third, agency theory explicitly deals with the balance of wages and incentives. Beatty and Zajac (1994) and Zajac and Westphal (1994) focus on incentive pay, particularly the use of non-cash incentives (i.e., stock options) and do not analyze pay levels. We investigate the influence of risk on both pay levels and pay mix (i.e., the balance between incentives and salary).

THEORY AND RESEARCH PROPOSITIONS

Three fundamental behavioral assumptions underlie agency theory: that both parties are 1) rational and 2) self-interested, and that the agent is 3) both effort and risk averse (Baiman, 1990; Jensen & Meckling, 1976; Levinthal, 1988). The agent's rational self interest and effort aversion creates the potential for moral hazard-agents may act to maximize their outcomes (e.g. compensation) without extending effort toward the principal's objectives (Baiman, 1990; Eisenhardt, 1989; Nilakant & Rao, 1994). The agency problem which results from these assumptions centers on how to structure monitoring (i.e., the principal's ability to observe or constrain the agent's actions) and compensation (i.e., the use of behavioral- versus outcome-

based pay) to align the interests of the agent with those of the principal (Jensen & Meckling, 1976). Agency theory defines optimal contracts in terms of maximizing the principal's outcomes (Bergen, Dutta, & Walker, 1992; Levinthal, 1988) and so its predictions focus on how differences in the structure of monitoring and compensation systems lead to variations in organizational success (Gibbons & Murphy, 1990; Jensen, 1983). Since performance can be signaled either by actions or outcomes of those actions (Govindarajan & Fisher, 1990), the principal's primary choice centers on creating the appropriate balance between base (behavioral-based) pay and incentive (outcome-based) pay which is necessary to induce the agent to act in the principal's best interests (Baiman, 1990). Optimal compensation contracts must, therefore, reflect the trade-offs inherent in this balance by using enough outcome-based pay to align the agent's interests with those of the principal without shifting too much risk and compensation variability onto the agent (Gibbons & Murphy, 1990; Jensen & Murphy, 1990).

For the principal, there are costs-including performance trade-offs-for using incentive pay since it may cause agents to reduce effort, demand higher pay levels, or induce them to engage in practices designed to reduce the variability of their pay which are coincidentally detrimental to organizational outcomes (Amihud & Lev, 1981; Walsh & Seward, 1990). Ideally, principals can simply structure compensation contracts in favor of the agent's preference for fixed pay (e.g., a wage or salary) (Baiman, 1990; Eisenhardt, 1989; Stiglitz, 1987). The agency model prescribes that because the agent is also assumed to dislike work, fixed pay is more likely to be used when the principal can easily observe (monitor) whether or not the agent engages in appropriate activities. When factors (e.g., task programmability, information asymmetries; Eisenhardt, 1989)make it more difficult to monitor agents' effort, principals must rely more heavily on incentive pay to align agents' interests (Jensen & Murphy, 1990; Kren & Kerr, 1993).

Much of the recent agency-based compensation research supports the notion that incentive pay can be useful for aligning the actions of agents with desired organizational outcomes (Baker, Jensen, & Murphy, 1988; Jensen & Murphy, 1990; Tosi & Gomez-Mejia, 1989). For example, Murphy (1985) studied the pay-performance relationship of 501 managers in 72 companies and found that, salary, bonus, and total compensation were positively related to total shareholder return and growth in firm sales. Abowd (1990) analyzed the incentive pay-firm performance relationship among 225 companies and found that greater use of incentive pay is positively related to total shareholder return and gross economic return. Other studies have also found a positive relationship between the use of incentive pay and firm performance (for a review see Gerhart & Milkovich, 1992). The central theme of this research

has been that when it is difficult for the principal to gain information about the agent's behavior, outcome-based compensation contracts solve the agency problem (Baker, Jensen, & Murphy, 1988). However, the focus of this research literature has been on effort aversion; concerns about risk aversion tend to be de-emphasized (Beatty & Zajac, 1994; Levinthal, 1988). Given that effort and risk aversion are given equal prominence in classic agency theory, it is important to integrate risk into agency-based compensation research to understand whether and how risk might influence the efficacy of incentive pay for achieving organizational objectives. We explore these relationships in the sections that follow.

Business Risk and the Use of Incentive Pay

Risk is uncertainty about outcomes or events, especially with respect to the future (Glickman & Gough, 1990; Miller & Bromiley, 1990). Business risk impairs forecasting and planning activities which makes it harder to create an organizational strategy and plan future actions (Bettis & Thomas, 1990; Sharpe, 1990). Typically defined as greater variability in organizational returns and increased chances for corporate ruin (Baird & Thomas, 1985; Fiegenbaum & Thomas, 1988; Miller & Bromiley, 1990), business risk is of concern to both principals and agents. For principals, the primary source of concern is whether agents will exert productive effort toward the principal's objectives. Higher levels of business risk not only make it more difficult for the principal to determine what actions the agent does take, but also make it more difficult for the principal to determine what actions the agent should take (Stiglitz, 1987; Stroh, et al., 1996). Under conditions of greater business risk "...managerial behavior simultaneously figures more prominently in a firm's future and becomes more difficult to monitor (Demsetz & Lehn, 1985: 1159; Kren & Kerr, 1993)" and the principal cannot easily determine if the agent's actions "...are being taken in pursuit of the principal's goals or are self-interested misbehavior (Milgrom & Roberts, 1992: 171)." In other words, greater business risk makes it difficult to determine whether variations in organizational performance are due to inferior managerial performance or factors outside of the manager's control (Antle & Smith, 1985). Classic agency models suggest that solving the agency problem is not a straightforward choice between monitoring when it is possible, and incentives when monitoring becomes too difficult. Indeed, the agency literature is ambiguous about how this trade-off should be achieved. We suggest part of the answer may lie in considering the implications of business risk for agents. Agency theory's basic risk aversion assumption asserts that agents do not like variability (i.e., risk) in their compensation (Eisenhardt, 1989; Stiglitz, 1987). We suggest that greater business risk itself may also impose risk on agents by reducing their income and employment stability. Since compensation for current performance is usually received at some point in the future,

more uncertain cash flows or increased chances for organizational failure (i.e., higher business risk) may make it more difficult for the company to meet its future compensation obligations, imposing additional risk on all forms of pay. Another potential negative effect of business risk for agents decreased employment security-is not explicitly considered in most interpretations of agency theory, yet may exert a strong influence on agents' behavior. According to internal labor markets theory (ILM), people place great value on employment stability because it protects them from the vagaries of the external labor market (Doeringer & Piore, 1971; Osterman, 1992). Research suggests that greater risk of employment loss may lead to poor employee performance, demands for higher pay levels, and reduced commitment to the organization (Osterman, 1992). Thus, higher business risk, with its concurrent potential for insufficient firm performance or outright organizational ruin, places the agent's entire employment relationship in jeopardy. In addition to potentially jeopardizing an agent's pay or employment, higher business risk also means that external factors which are outside the agent's control may negatively influence outcome measures thereby reducing the agent's incentive compensation (Antle & Smith, 1985; Janakiraman, et al, 1992). Industry-wide economic conditions and other external forces may negatively affect the firm's performance regardless of the agent's actions. These forces may also impede the agent's ability to positively affect outcome measures. Thus, higher business risk may reduce or negate the agent's incentives even though the agent is working to achieve the principal's objectives.

Rather than aligning agents' actions more closely with the principal's objectives, when faced with greater risk the increased use of incentive pay has the potential to negatively influence the behavior of agents. Because they are already subject to higher income and employment risk, agents of higher business risk organizations may react by withholding effort or taking actions designed to reduce their risk exposure which are coincidentally detrimental to organizational performance (Hoskisson, Hitt, Turk, & Tyler, 1989; Kren & Kerr, 1993). For example, managers may adopt detrimental entrenching practices (e.g., compromising performance measures, neutralizing control mechanisms, adopting deleterious corporate strategies)(Walsh & Seward, 1990) or fail to take actions that enhance the firm's value (Quinn & Rivoli, 1993). Amihud and Lev (1981) suggest that managers may use conglomerate mergers, which are often associated with negative shareholder returns, simply to reduce employment and earnings risk. Empirical evidence supports this notion. Eisenhardt (1988) found the outcome uncertainty was negatively related to the use of commissions and positively related to the use of salaries. Hoskisson, Hitt, and Hill (1993) found that outcome-based performance measures

(e.g., financial controls) were associated with lower investments in research and development even when such decisions worked against the organization's interests.

We suggest that business risk on its own increases the agents' overall risk exposure by jeopardizing both the entire employment relationship and the agent's income stream. When business risk is high, the additional risk imposed by greater use of incentive pay may become dysfunctional for directing managers' behaviors. Recognizing this potential, we suggest that principals of higher risk firms will tend to use incentive pay less to avoid increasing agents' risk. Thus, we expect that higher business risk will be negatively related to the use of incentive pay.

> **H1:** *Business risk will be negatively related to the use of incentive compensation in managerial pay contracts.*

Business Risk and Pay Level

Agency theory asserts that agents will accept greater risk if they are provided with some insurance which helps protect their interests (Conlon & Parks, 1990; Holmstrom 1987). The risk averse behavior induced by increased use of incentive compensation might be mitigated by increasing the agent's wealth through higher base pay levels. This idea, which goes back to Bernoulli (1758/1954), asserts that people's reactions to risk are inversely related to their current level of wealth; greater wealth makes losses relatively less painful (Bernstein, 1996, Sharpe, 1990). Greater base pay increases the agent's current wealth thereby offsetting some of the potential losses associated with both business risk and incentive compensation. Indeed, classic definitions of agency theory propose that insurance will come in the form of higher base pay (Baiman, 1990). This premise is echoed in ILM theory which asserts that people will require higher pay levels in exchange for reduced stability in their employment and future income stream (Osterman, 1992).

> **H2:** *Business risk will be positively related to base pay in managerial compensation contracts.*

Business Risk, Incentive Pay, and Organization Performance

One of the essential features of agency theory is its predictions relating firm performance to the use of incentive pay (Baiman, 1990; Eisenhardt, 1989; Jensen & Murphy, 1990). Previous agency-based incentive pay research has implicit normative performance implications: Firms which rely more heavily on incentive compensation will have better subsequent performance. We should, therefore, observe a positive incentive pay-firm performance relationship. However, by drawing upon classic agency theory and the internal labor markets and the risk literatures, we have argued that greater use of incentive pay by higher business risk firms may cause agents to take actions that are detrimental to firm performance. Thus, we suggest that higher

risk companies will tend to de-emphasize the use of incentive compensation. This implies that among higher risk firms, greater use of incentive pay should be negatively related to firm performance. That is, we hypothesize a negative relationship between higher business risk, incentive compensation, and firm performance.

H3: *For firms with higher business risk, the use of variable compensation is negatively related to firm performance.*

Implications of Managerial Control for the Risk-Incentive Pay-Firm Performance Relationship

Our discussion and hypotheses so far have assumed a strong principal who makes decisions about the structure of agents' compensation contracts. However, firms vary in the control their principals have over the structure of agents' pay. Berle and Means (1932) were among the first to discuss this notion when they centered on the consequences of separating management and ownership for managerial behavior. These ideas, referred to as managerial capitalism, assert that the level of control held by non-manager owners influences the actions of internal managers. Owner-controlled firms are those organizations that have at least one large external shareholder (i.e., a strong principal) who controls a significant proportion of the firm's outstanding stock. Outside ownership is essentially a form of monitoring where the major stockholder has the power to control managerial actions (Werner & Tosi, 1995). In the absence of such a large shareholder managers are subject to weaker principal control which may allow managers to manipulate their compensation contracts by reducing the use of outcome-based pay and increasing base pay, especially when risk is higher. In studies of these assertions, Tosi and Gomez-Mejia (1989) and Gomez-Mejia, Tosi, and Hinkin (1987) find that the use of incentives is lower among manager-controlled firms as compared with owner-controlled firms. Congruent with this research, we posit that HI and H2 will hold more strongly for owner-controlled firms.

H4a: *The relationship between risk and the use of incentive compensation holds more strongly in owner-controlled firms.*

H4b: *The relationship between risk and base pay levels holds more strongly in owner-controlled firms.*

METHODS

Data Sources

Three archival data sources were combined for this study. The managerial compensation data was drawn from Cornell's Center for Advanced Human Resource Studies (CAHRS) compensation data base (Abowd, 1990; Gerhart & Milkovich, 1990). The data

comprise annual compensation survey data from a major consulting firm for the years 1981 to 1988. The database contains company financial and pay policy data for approximately 740 firms and individual pay, job, and demographic information for an average of 75 randomly selected managers from each participating company. The company data include a variety of information about compensation policies and corporate financial statistics. The individual pay information includes annual salary, annual bonus, pay range information, job tenure, age, and years of education. Not all companies participated in the survey each year. Data for some other companies was incomplete for one or more years and these companies were excluded from the analysis. For the current analysis, data for over 500 companies and over 150,000 managerial observations were use over the period 1981 to 1988. The average number of managerial observations for a firm was 45.98 and the average number of time series was 3.6. Data for stock market risk were taken from the Center for Research on Security Prices data base (CRSP). Accounting and financial data were drawn from COMPUSTAT data files (Standard & Poor's, 1992). We matched the CAHRS compensation survey information to the CRSP and COMPUSTAT data using CUSIP numbers.

Measures of Business Risk

We drew our measures of risk from previous agency-based compensation research and the strategy-based risk literature (Antle & Smith, 1990; Janakiraman, et al. 1992; Miller & Bromiley, 1990). Risk was defined as the volatility in an organization's performance and measured it in two ways: variation in the firm's income stream and variability in the firm's stock market returns . We computed systematic and unsystematic components of both risk measures following the capital asset pricing model (CAPM; Miller & Bromiley, 1990; Modigliani & Pogue, 1993). Systematic risk is the amount of price variation in an organization's income stream (ROA) or stock returns (RET) that can be explained by changes in the overall market of firms. Unsystematic risk measures variation in ROA or RET due to factors specific to the organization itself, such as managerial decisions (Kren & Kerr, 1994; Miller & Bromiley, 1990). We use monthly stock data over the previous ten year period to compute measures of stock market risk. A value weighted market portfolio of all stocks in the CRSP data base was the market index. A separate beta and epsilon were calculated for each year. The risk free return was the U.S. government Treasury bill rate at time 1. We computed similar measures of systematic and unsystematic income stream risk using annual accounting data from the previous ten year period (Ferris & Reichenstein, 1993). The market index was a value-weighted average of all companies in the COMPUSTAT primary, secondary, tertiary, full, and research data bases for each year. In the analyses, we use a lagged measure of risk at 1-1 based on the premise that

historical risk will influence current compensation decisions and firm performance.

Compensation Measures

Incentive or performance-contingent pay refers to that portion of pay that is dependent upon firm performance (Conference Board, 1993; Milkovich and Newman, 1996). Although incentive pay includes a variety of forms that are not added into base, bonuses are among the most common (Hewitt Associates, 1993; McAdams & Hawk, 1994). Bonuses are likely to be contingent upon current year's firm performance and, thus, are likely to reflect the uncertainty facing organizations. Our measure of incentive pay was based on the ratio of bonus-to-base pay derived by dividing a manager's annual bonus by the manager's annual base. Base pay was measured by the natural log of annual base pay.

We specified two different classes of compensation measures depending on the level of analysis. Since agency theory predictions are framed in terms of contracts with single agents and, therefore, involve individual-level pay, we use pay data for individual managers in Equations 1 through 3. Our investigation of the firm performance-compensation relationship involved firm-level outcomes. We computed a proxy of firm compensation policies by using the average pay of all the managers reported by a firm in a single year.

Firm Performance

Since the principal (owners) of the firms in our sample are the owners of its common stock, we chose a performance measure that reflected changes in the value of the firm to these shareholders and one which is commonly used in previous research: total shareholder return (TSR) (Abowd, 1990; Miller and Bromiley, 1990). TSR consists of the year-end closing price of a firm's stock plus adjusted dividends divided by the stock return from the previous year. It reflects the one year total gain (loss) a shareholder received for holding the firm's common shares. Bonuses are typically tied to short-term measures of firm performance and so our measure of performance is also short-term. To control for past performance, we use the average return on equity over the previous 10 years (i.e., t-1 through t-10). The time series data allow us to analyze relationships from several time periods, but we not that our measures of both managerial compensation and firm performance are short term. Thus, the time series serve primarily to measure relationships in several years rather than over an extended period of time.

Ownership

Data on firm ownership were collected from Securities and Exchange Commission (SEC) filings. We created indicator variables for firms which had at least one major, non-managerial shareholder who holds 5% or more of the firm's stock and retained voting rights

to those shares. The 5% rule is a common cut-off use in research on managerialism (Gomez-Mejia, et al., 1987).

Control Variables

Firm size has been related to pay levels and may be related to the use of incentive compensation (Gerhart & Milkovich, 1990; Kroll, Simmons, & Wright, 1990). In our sample total assets, net sales, common equity, and number of employees were all highly correlated (average r = .82). We use log assets as a control for firm size in both the compensation and performance analyses. To further control for firm effects, we include a random intercept for every organization in the analysis. To control for industry-related factors we included random intercepts for each two-digit SIC code in our regression equations. We controlled for human capital factors by including age and organizational tenure in the compensation analyses.

Statistical Models

We estimated the following models to test our research hypotheses:

H1 & H4a: $\text{Incentive Pay}_{ijt} = \beta_0 + \beta_1 \text{ Outside Owner}_{jt} + \beta_2 \text{ Systematic Risk}_{jt-1} + \beta_3 \text{ Unsystematic Risk}_{jt-1} + \beta_4 \text{ Systematic Risk}_{jt-1} * \text{Outside Owner}_{jt} + \beta_5 \text{ Unsystematic Risk}_{jt-1} * \text{Outside Owner}_{jt} + \beta_k \text{ Individual}_{ijt} \text{ and Firm Controls}_{jt} + e_{ijt}$, [1]

H2 & H4b: $\text{Base Pay}_{ijt} = \beta_0 + \beta_1 \text{ Outside Owner}_{jt} + \beta_2 \text{ Systematic Risk}_{jt-1} + \beta_3 \text{ Unsystematic Risk}_{jt-1} + \beta_4 \text{ Systematic Risk}_{jt-1} * \text{Outside Owners} + \beta_5 \text{ Unsystematic Risk}_{jt-1} * \text{Outside Owner}_{jt} + \beta_k \text{ Individual and Firm Controls} + e_{ijt}$, [2]

H3: $\text{Firm Performance}_{jt} = \beta_0 + \beta_1 \text{ Outside Owner}_{jt} + \beta_2 \text{ Systematic Risk}_{jt-1} + \beta_3 \text{ Unsystematic Risk}_{jt-1} + \beta_4 \text{ Base Pay}_{jt} + \beta_5 \text{ Incentive Pay}_{jt} + \beta_6 \text{ Systematic Risk}_{jt-1} * \text{Incentive Pay}_{jt} + \beta_7 \text{ Unsystematic Risk}_{jt-1} * \text{Incentive Pay}_{jt} + \beta_8 \text{ Firm Performance}_{jt-1} + \beta_k \text{ Firm Controls}_{jt} + e_{jt}$, [3]

where,

β_k = parameters to be estimated,

i = a manager,

j = a firm,

t = a year,

and e_{ijt} and e_{jt} = error terms.

The interaction terms in Equations I and 2 allow us to investigate whether the relationships between compensation and risk hold more strongly in owner-controlled firms. The interaction term in Equation 3 allows us to investigate the joint effects of variable compensation and risk on firm performance. This relationship can be expressed as (Cohen & Cohen, 1983):

$$[(\beta_{Incentive\ pay} + \beta_{Interoction} * \text{Risk})\ \text{Pay}] + [\text{Intercept} + (\beta_{risk} * \text{Risk})].$$

Since our data comprise managers group within organizations which are, in turn, grouped within industries, we use hierarchical linear modeling (HLM; Byrk & Raudenbush, 1992; Littell, Milliken, Stroup, & Wolfinger, 1996). HLM is specifically formulated to analyze multi-level data and can account for correlated and heterogeneous variances. It not only reduces or eliminates concerns about aggregation bias and poor statistical precision, it provides a mechanism for directly modeling how variables measured at one level, for example firm-level risk, effect relations occurring at another, for example this structure of individual manager's compensation contracts. FILM is also appropriate for unbalanced data since a separate error term for each firm, adjusted by its sample size, is computed. We utilized an approach that accounts for the effects of industries on firm-level variables and the effects of firms on individual-level variable. We also modeled firm and industry effects as random since we view our sample of firms as a subset of a larger population of organizations. Goodness of model fit is assessed in two ways: (1) a significant chi-square value for the reduction in -2 REML log likelihood between the proposed and alternative models and (2) a reduction in Akaike's information criterion (AIC)(Littell, et al. 1996).

RESULTS

Descriptive statistics and a correlation matrix for the data are presented in Table 1. The data are from relatively high level managers. The average base pay among all managers is $85,288 with a maximum of $1.2 million. The average bonus is $21,161 with a maximum of $6.0 million. The average bonus-to-base ratio is 19% with a minimum of zero and a maximum of 797%. The sample of firms is relatively larger corporations. Average assets are $1,072 million and average number of employees is 31,822. Consistent with previous risk research, our measures of systematic and unsystematic risk are correlated (Black, Jensen, & Scholes, 1972; Modigliani & Pogue, 1993). Systematic and unsystematic stock market risk are correlated at .42 while the ROA measures are correlated at .32.

TABLE 1
Descriptive Statistics[a]

Variable	Mean	S.D	1	2	3	4	5	6	7	8	9	10
I. log Assets	14.35	1.35										
2. Past performance[b]	.12	.13	.13									
3. Total shareholder return[b]	.17	.39	0	.04								
4. Systematic stock market risk[b]	1.07	.40	-.15	-.19	-.11							
5. Unsystematic stock market risk[b]	.53	.21	-.31	-.27	-.15	.42						
6. Systematic ROA[c]	.008	.01	.02	-.05	-.09	.17	.04					
7. Unsystematic ROA[c]	.11	.07	-.16	-.06	-.13	.29	.39	.32				
8. log Base pay[d]	11.20	.52	.37	0	-.03	-.02	-.11	0	-.04			
9. Incentive ratio[d]	.19	.20	.25	.20	0	-.04	-.06	-.01	-.07	.49		
10. Age[d]	47.20	8.70	.40	0	0	0	.14	.07	-.06	.39	.21	
11. Organizational tenure[d]	14.67	10.19	.42	0	.04	-.10	-.27	.05	-.12	.22	.14	.60

[a]Correlation coefficients greater than .04 in absolute value are significant at $p < .05$
[b]n=2, 513
[c]n=1,915
[d]n=197,060

Risk and Incentive Pay

H1 predicts that greater risk will be negatively associated with the use of incentive pay. Unstandardized coefficients for the regression of compensation decisions on risk are presented in Table 2. The chi-square difference and reduction in the AIC are significant for all models. We found a negative relationship in three of four measures of risk: Systematic stock market risk and both measures of income stream risk. As a whole, these results support **H1**. The coefficient for unsystematic income stream risk is -.38 (standard error [s.e.] = .05, $p \leq .001$) and for systematic stock market risk is -.01 (s.e. = .003, $p \leq .001$). Although negative in sign, the coefficient for systematic income stream risk is not significant. One measure of risk, unsystematic stock market risk, is positively related to the use of incentive compensation ($\beta = .05$, s.e. = .008, $p \leq .001$) which is not consistent with **H1**. Given the different magnitudes of the coefficients and the fact that one differs in sign from the others, these data suggest that the way risk is measured is important. We pursue this finding in more detail in the discussion section.

The data provide mixed information about **H4a**. Firms with strong outside owners do appear to de-emphasis the use of incentive pay to a greater extent when systematic and unsystematic stock market risk are higher. The coefficient for the outside owner-by-systematic stock market risk interaction is -.01 (s.e. = .004, $p \leq .001$) and the outside owner-by-unsystematic stock market risk interaction is -.08 (s.e. = .008, $p \leq .05$). Likewise, outside owners appear to use incentive pay less when unsystematic income stream risk is higher (β = -.17, s.e. = -.02, $p \leq .001$). Conversely, firms with strong outside owners appear to emphasize the use of incentive pay more when systematic income stream risk is higher (Interaction $\beta = .29$, s.e. = .12, $p \leq .001$). Again, the type of risk appears to be important for understanding the actions of firms with strong principals.

TABLE 2[1]

Regression of Risk on Managerial Compensation
(Cell entries are unstandardized coefficients, standard errors are in parentheses)

Variable	Bonus to base ratio	log(Base pay)
Log Firm Assets	.03***	.20
	(.002)	(.004)
Age	.004***	.02*
	(.00007)	(.0002)
Organizational Tenure	.0008***	-.002*
	(.00006)	(.0001)
Owner	.06***	.10*
	(.005)	(.01)
Systematic Stock Market Risk	-.01*** -.01	
	(.003)	(.008)
Unsystematic Stock Market Risk	.05*** .22***	
	(.008)	(.02)
Systematic Stock Market Risk*Owner	-.01*** -.06*	
	(.004)	(.01)
Unsystematic Stock Market Risk*Owner	-.08*** -.O1 ***	
	(.008)	(.002)
-2 Log likelihood	-104,297.00	156,540.80
X^2 difference	6,973.00***	8,775.70***
Reduction in AIC	3,485.72	4,387.60
R^2	.31	.39
Change in R^2 from model without risk variables	.01	.01
N	158,782	158,782

** $p < .01$, *** $p < .001$

[1] Random intercepts for each firm and for two-digit SIC codes were included in these models but are not reported

TABLE 2 (Continued)

Variable	Bonus to base ratio	log(Base pay)
Log Firm Assets	.03*** (.001)	.21 (.004)
Age	.004*** (.00006)	.02*** (.0002)
Organizational Tenure	.0008*** (.00006)	-.002 (.0001)
Owner	.01*** (.002)	-. 03 (.006)
Systematic Income Stream Risk	-.01 (.21)	0.02 (.50)
Unsystematic Income Stream Risk	-.38*** (.05)	.23 (.13)
Systematic Income Stream*Owner	.29** (.12)	.10 (.20)
Unsystematic Income Stream*Owner	-.17*** (.02)	.42*** (.04)
-2 Log likelihood	-110,229.00	159,605.10
X^2 difference	1,041.00***	5,711.40***
Reduction in AIC 519.32 3,155.5		
R^2	.31	.39
Change in R^2 from model without risk variables	.01	.01
N	154,200	154,200

** $p < .01$, *** $p < .001$

Risk and Pay Level

The results from the pay level analyses support **H2** since greater risk is positively related to the use of base compensation, but the manner in which risk is measured is again important. The results are presented in Table 2. The chi-square difference and reduction in the AIC are significant for all models. The coefficient for unsystematic stock market risk is .22 (s.e. = .02, $p \leq .01$) and for unsystematic income stream risk it is .23 (s.e. = .13, $p \leq .01$). Base pay levels are not related to either measure of systematic risk. The coefficients for ownership-by-risk interactions are significant. Thus, these data provide mixed support **H5b**. The coefficients for higher systematic and unsystematic stock market risk, owner-controlled firms are -.06 and -.01 (s.e. = .01 and .002, $p \leq .001$) and for systematic and unsystematic income stream, owner-controlled firms are .10 (s.e. = .20, n.s.) and .42 (s.e. = .04, $p \leq .001$). These findings indicate that firms with strong outside owners reduce pay levels in reaction to stock market risk and increase them in reaction to income stream risk, suggesting that differences in the meaning and measurement of risk is important.

Risk, Pay, and Firm Performance

We analyzed the relationship between compensation and risk measures on firm performance by including an interaction term. The results are presented in Table 3. The reduction chi-square and AIC are significant for all models. We recognize that our performance analyses have limitations since we were unable to control for all exogenous factors which might influence firm performance or the use of incentive compensation. Since agency theory posits that a principal's choice of compensation scheme has implications for the firm's performance, our performance analyses do provide some evidence about the efficacy of these agency-based predictions. Consistent with H3 the results indicate that higher levels of risk and higher variability in pay may be associated with lower firm performance. We note that base pay levels are positively related to firm performance. The coefficients for base pay in the two models are.04 (s.e. -.02, $p < .001$), results which are consistent with previous research (Levine, 1993). Incentive pay is, however, negatively related to firm performance suggesting the main effect of incentives is to reduce firm performance. The main effects for risk indicates it is also negatively related to firm performance; the coefficients for systematic stock market risk and both measures of income stream risk are negative and significant. The interaction effects indicate that higher risk firms which use more incentive pay may have lower firm performance, but again the manner in which risk was measured matters.

TABLE 3[a]

Regression of Risk and Incentive Compensation on Firm Total Shareholder Return
(Cells are unstandardized coefficients, standard errors are in parentheses)

Variable	Coefficients	Coefficients
Past Performance	-.11**	-.11
	(.006)	(.06)
Log Firm Assets	-.02*	-.01
	(.009)	(.008)
Age	-.003	-.003
	(.004)	(.004)
Organizational Tenure	.006**	.006**
	(.003)	(.003)
Owner	.03	.02
	(.02)	(.02)
log Base Pay	.04***	.04**
	(.02)	(.02)
Incentive Pay	.14	.15
	(.20)	(.20)
Systematic Stock Market Risk	-.12***	____
	(.03)	____
Unsystematic Stock Market Risk	.08	____
	(.08)	____
Systematic Stock Market Risk - Incentive Pay	.08	____
	(.16)	____
Unsystematic Stock Market Risk - Incentive Pay	-.53*	____
	(.33)	____
Systematic Income Stream Risk	____	-2.12*
	____	(1.25)
Unsystematic Income Stream Risk	____	-.44***
	____	(.18)
Systematic Income Stream Risk*Incentive Pay	____	2.95
	____	(5.03)
Unsystematic Income Stream Risk*Incentive Pay	____	-.10
	____	(.80)
-2 Log Likelihood	1,109.05	1,063.39
X^2 difference	242.32***	33.45***
Reduction in Akaike's Information Criterion	111.69	16.28
R^2	.06	.06
Change in R^2 from model without risk variables	.02	.01
N	1,773.00	1,800.00

* p <.05 ,** p < .01, *** p < .001

[a] Random intercepts for each firm and for two-digit SIC codes were included in these models but are not reported

To determine the joint effects of risk and incentive pay on firm performance, hypothetical firms were created (Cohen & Cohen, 1983). Hypothetical high risk firms were created by assuming a level of risk which is one standard deviation above the sample average. Then, low and high incentive conditions were set by establishing bonus-to-base rations one standard deviation above and below the sample average. Holding all other variables at their means, the difference total share holder return (TSR) for a high unsystematic stock market risk/high incentive firm incentives is -.025 versus .047 for a high unsystematic stock market firm/low incentive firm, a difference of .075 in raw TSR. This is not only a 288% improvement for the low incentive firm, but it moves its performance from negative to positive returns. A similar improvement in performance is evident for high unsystematic income stream risk firms. In this case the TSR for the high risk/low incentive firm is 20% better than for the high risk/high incentive firms although high unsystematic income stream risk firms tend to experience negative returns, all else equal. Incentives do not affect performance of high systematic income stream risk firms, and higher incentives are related to better performance among high systematic stock market risk firms although the performance these high risk firms is negative regardless of the amount of incentives used in managerial compensation contracts. These results indicate that the effects of incentive pay on organizational performance is dependent upon the level of business risk. And, how risk is defined and measured clearly has implications for understanding the relationship.

DISCUSSION

Sources of Risk, Compensation Decisions, and Firm Performance

Our results raise questions about the predictions made by some previous agency-based compensation research regarding incentive pay. The data suggest that organizations facing higher risk do not place greater emphasis on *short-term* incentive pay, *indeed they place less emphasis on it*. In addition, higher risk firms which relied more heavily on incentive pay tended to exhibit poorer performance than higher risk firms which de-emphasize incentive compensation. Including risk considerations appears to substantially alter the observed pay-performance relationship. These results suggest that the employment contract is more complex than modeled by previous agency research which has tended to emphasize the use of performance contingent pay. Furthermore, the results suggest that considering risk, in any form, may be more important than incentive concerns. That is, striking the incentive-risk sharing balance may require paying more attention to risk sharing than to effort aversion. Since some of the results differ somewhat depending on how risk was measured, it may be possible that decision makers might react differently to different sources of risk. In our data, the observed

relationships were stronger for measures of firm-specific or unsystematic risk. Likewise, owners' reactions differed depending upon the source of risk. We also find that compensation decision makers adjust the balance between base and incentive pay in reaction to risk. Higher risk firms tended to increase base pay and decrease incentives when risk is higher. Consistent with Levine (1993), pay level decisions in our sample have implications for firm effectiveness: higher base pay was positively related to firm performance. This highlights the need to focus on the entire compensation contract and not just the incentive portion.

A better understanding of the conditions under which agency predictions hold might be gained by examining different sources of risk and how they are related to compensation decisions. Miller and Bromiley (1990) and Collins and Ruefli (1994) review a number of different operationalizations of risk which may be worthy of exploration. Beatty and Zajac (1994) use measures of risk which were intended to tap sources of uncertainty particular to IPOs. Application of these types of measures may be informative. Much remains to be learned about the dimensions of risk and their relationship to organizational strategy and outcomes (Collins & Ruefli, 1994; Miller & Bromiley, 1990). Even so, research has shown that risk influences firm performance (Miller & Bromiley, 1990). Our study extends that research by indicating risk might also influence other strategic performance relationships. In addition, we did not deal directly with low risk firms. Perhaps they have greater flexibility in how they can structure compensation contracts. This too is an important area for further research.

Effects of Risk on the Structure of Managerial Compensation

We suggest that the typical description of agency theory tells only part of the story. That is, principals might act to align agent behaviors through the use of incentive pay schemes, but its effect on an agent's behavior may be more complex than typically assumed. We have suggested that greater risk may impose greater uncertainty on the entire employment relationship and that firms reduce (rather than increase) the variability in pay to offset this increased risk (Simon, 1951). Agency theory asserts that any risk premium paid will be in response to greater variability in pay and internal labor markets theory asserts that employees will require higher base pay to offset increased income and employment insecurity. Indeed, we found that risk is positively related to base pay. However, these firms are not emphasizing incentive pay. Higher base pay may be a response to the uncertainty imposed on the agent's overall employment contract by greater firm risk. That is, agents may be defining their utility in terms of employment security, stability of their job responsibilities, or other aspects of their contract, not just their pay. Perhaps greater organizational risk is interpreted by agents as indicating greater potential for variability in their overall employment relationship. Simon (1951)

argued that employees would be willing to bear the brunt of uncertainty in the employment relation in exchange for a premium wage. In this sense, our data concur with Simon's assessment. Simon (1991) argues that the moral hazard and opportunism assumptions have lead agency theory to incorrectly rely on monitoring and compensation as the only remedies for self-interested behavior. He asserts that loyalty and identification with organizational goals are as important as compensation for motivating the effort required for firm success. This suggests that compensation is one element of a set or bundle of valued returns which motivate employee actions. It might be fruitful to extend the conceptualization of returns beyond pay and toward an investigation of the collection of returns (e.g., cash pay, benefits, perks) necessary to motivate actions in higher versus lower risk situations.

Redefining Risk in Agency Relationships

In addition to concerns about risk in pay, we suggested that agent behaviors might also be influenced by perceptions about other sources of risk in the employment relationship, including employment security. Recent research on employment contracts indicates employees are concerned about the length of the employment relationship, among other conditions (Rousseau, 1995). Thus, managers may not passively allow the principal to foist risk on them. Hoskisson, Hitt, and Hill (1993) found that managers in higher risk situations tended to undertake actions to reduce risk (e.g., decrease R&D expenditures). Our data support this notion since the observed ,relationships differed depending upon whether the manager was in a manager- or ownercontrolled firm. However, across ownership groups, the costs of inefficient risk sharing seem to be of concern when companies place greater emphasis on outcome-based pay. We could not investigate specific behavioral or attitudinal side-effects of increased emphasis on incentive pay in higher risk situations, but these are important issues for future study. We need to know more about how employees process risk in the employment relationship, especially risk related to pay and other general employment factors such as risk of a lay-off, loss of promotion, or chance for unfavorable assignments.

Importance of Contextual Factors

We controlled for one contextual factor which may moderate the agency relationship: the nature of firm ownership. Our use of the presence of large external shareholders was to adjust for strong principals and the ability of agents, in this case managers, to manipulate their compensation contracts (Tosi & Gomez-Mejia, 1989). Research suggests that other proxies for firm control variables are related to managerial compensation, measures we were unable to include in our analyses. A prominent candidate is the ability of managers to manipulate the firm's Board of Directors (Lambert, Larcker, & Weigelt, 1993; Walsh & Seward, 1990; Westphal

& Zajac, 1994). For example, the number of BOD members appointed by the CEO may be positively related to the CEO's ability to manipulate his or her compensation and that of other senior managers (Kerr & Bettis, 1987; Lambert, et al. 1993). This research is complementary to that on managerial capitalism because it depicts managers as willing to manipulate their income through political means. In addition, we only controlled for industry effects and did not attempt to explain how they might influence the relationships we studied. Since almost all of our industry indicator variables are highly significant, and since there are both positive and negative coefficients, closer examination of industry effects seems warranted. Another potential explanation for these results is that higher risk firms simply lack the financial resources to pay their employees competitively. However, given the fact that our data were drawn from very large, well established firms, this alternative explanation seems less plausible. Investigating firms from a wider sample of organizations, which includes both small and large firms, might lend additional information to answer this question.

Risk, Long-term Incentives, and Firm Performance

An area that is in great need of study is the relationship between long-term incentive pay, risk, and firm performance. Beatty and Zajac (1994) have shown that the use of long-term incentive pay is related to business risk. We need to know more about the risk-long-term incentives--organizational performance relationship. Agency theory is relatively ambiguous about how short- and long-term incentive pay might exert different influences on subsequent firm performance. Since longer-term incentive pay is a large part of many manager's pay packages (Bloedorn & Chingos, 1994), examining the interaction of long- and short-term pay and risk on firm outcomes is important. Some theorists suggest that incentive pay might cause managers to focus excessively on short-run profits and ignore the long-term value of the firm. Clearly, the long-term focus of some forms of compensation might exhibit a greater relationship to strategic decisions which have a pay-off at some future date. In this case, based upon our findings about the importance of how risk is measured, the measurement of both risk and firm performance may be critical.

Limitations and Directions for Future Research

Our study is the first to test the predictions agency theory makes about the relationship between risk, pay, and firm performance, but it is not without limitations. The data are 10 years old and were drawn from larger companies in the U.S. As exemplified by Beatty and Zajac (1994), smaller, more entrepreneurial businesses would provide another, perhaps unique, data source for analyzing the relationship between risk, compensation and firm performance. The age of our data may limit generalizability if business conditions are significantly different now

from those of 10 years ago. Our human capital controls did not account for factors such as education or functional expertise which might be important omissions. There are possible concerns about missing variables although we attempted to mitigate this by using a proxy of past performance. Controlling for all exogenous factors which might be related to performance or compensation decisions remains a difficulty in conducting all pay-performance research. Even so, we believe that compensation research must begin to address the links between compensation decisions and firm outcomes even in the face of potential statistical issues. Since most decisions about compensation systems are made with the intention of influencing future employee behaviors, we believe studying the relationship between compensation decisions and subsequent firm performance is important. The challenge researchers face is to create sufficiently elaborate data bases to conduct this type of research and to conduct research that is cumulative.

If principals do attempt to align agent behaviors through incentive pay, the actual measures use to determine incentive compensation payouts are important. While our data did not provide the actual measures upon which incentives were based, our study does provide some indication of the importance since some results differed depending upon how risk was characterized. For example, the association between risk, pay, and performance might be positive when a clear performance target is established, employees believe they can effect the performance target, and pay is truly contingent upon changes in the target. Under such a scenario we would expect a positive relationship, even if the firm was pursuing a more risky strategy.

In sum, we believe that more must be learned about the employee's perspective as it relates to agency models. Simply assuming a risk averse agent does not capture the full range of attitudes and behaviors employees exhibit under risk. It does not adequately specify how agent's reactions to risk are moderated by different sources of risk and other elements of the employment contract. Understanding how employees react to risk in the employment relationship, especially risk related to compensation, would better inform organizational decision makers about how pay can support strategic business objectives.

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