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November 1993

A Risk-Return Paradox: Risk, Performance-Based Pay and Performance

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Abstract

[Excerpt] In recent years, strategy researchers have examined the relationship between business risk and performance. The logic underlying this relationship is that organizations facing greater business risk seek to offset it with the prospect of higher financial returns. The research typically involves various financial measures of organization performance regressed on measures of risk. Surprisingly, the findings are contradictory. While some studies report evidence supporting a positive relationship between the risk organizations face and their performance (Aaker & Jacobson, 1987; Fiegenbaum & Thomas, 1988), others reported an inverse relationship (Bowman, 1982, 1984). These different results called into question the basic premise about the form of the risk-return relationship and left a void in understanding why organization decision makers might pursue more risky strategies. Advancing this line of inquiry, Miller and Bromiley (1990) noted that business risk, like financial performance, is multi-dimensional. Several dimensions of business risk emerged from their work including income stream and strategic or financial risk. They suggested that differences reported in the risk-return relationship resulted from different operationalizations of business risk.

Keywords

paradox, risk, performance, base, pay, business, return, research, organization, income, employee

Comments

Suggested Citation

A RISK-RETURN PARADOX:
RISK, PERFORMANCE-BASED PAY AND PERFORMANCE

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Working Paper #93-23

In recent years, strategy researchers have examined the relationship between business risk and performance. The logic underlying this relationship is that organizations facing greater business risk seek to offset it with the prospect of higher financial returns. The research typically involves various financial measures of organization performance regressed on measures of risk. Surprisingly, the findings are contradictory. While some studies report evidence supporting a positive relationship between the risk organizations face and their performance (Aaker & Jacobson, 1987; Fiegenbaum & Thomas, 1988), others reported an inverse relationship (Bowman, 1982, 1984). These different results called into question the basic premise about the form of the risk - return relationship and left a void in understanding why organization decision makers might pursue more risky strategies. Advancing this line of inquiry, Miller and Bromiley (1990) noted that business risk, like financial performance, is multi-dimensional. Several dimensions of business risk emerged from their work including income stream and strategic or financial risk. They suggested that differences reported in the risk-return relationship resulted from different operationalizations of business risk.

Agency theory offers another explanation of the apparently conflicting results reported in the risk-return relationship (Fama and Jensen, 1983; Hoskisson, Hitt, & Hill, 1989). Under agency theory, contracts are designed to align agent behaviors with the principal's objectives. Organizations facing greater risk adopt policies that are designed to shift some of the risk to employees while aligning their behaviors in a way that mitigates the risk through higher expected returns. Consequently, high risk organizations which adopt such policies, for example, a performance based pay scheme designed to align employee rewards with organizational objectives, will exhibit a different (positive) risk-return relationship compared to organizations which do not adopt such policies.

Aligning returns to employees with the business objectives (including the degree of risk they face) is also consistent with strategic - contingent models of organizations (Gomez-Mejia Balkin, 1992). Gomez-Mejia and Balkin and others assert that organizations which design their

employee pay programs to fit their business strategy will perform better than those that do not. The general proposition under both agency and strategic-contingent theories is that the form of the risk-return relationship is influenced by the alignment of the performance based pay program with the overall business strategy. Our study examines the degree to which performance based pay influences the organizational risk-return relationship. Specifically, we explore the extent to which riskier organizations are likely to generate greater returns depends on the degree to which pay is contingent on performance. Our results surprised us.

Business Risk and Organization Performance: The Paradox

Following the research reported in the finance literature, organizational researchers explored the idea that organizations with higher levels of business risk experienced higher returns. Bowman (1982, 1984) was one of the first to examine this relationship. He analyzed the correlation between risk levels and firm performance for 1,572 firms from 54 industries. He found that risk, measured as the variance in return on equity, was negatively correlated with return in 39 of 54 industries. Bowman concluded by noting these results created a risk-return paradox - if higher risk results in lower returns, it is unclear why firms would pursue higher risk strategies.

Others examined Bowman's risk-return paradox and reported conflicting results. Aaker & Jacobson (1987), found that measures of stock market risk were significantly related to return on investment. Using measures of stock market risk for 400 large companies, Amit & Livnat (1988) found a positive relationship between risk and profits. Fiegenbaum & Thomas (1988) also reported a positive risk-return relationship, but they also found that the relationship was at least partially dependent upon previous performance. Using firms representing 42 industries, they examined the risk-return relationship over 5-, 10-, and 20- year time periods from 1960-1979. The relationship was positive for performers above industry median and negative for those that

performed below industry median. Hence the Bowman risk-return paradox existed between organizations with historically weak performance compared to those with stronger financial performance.

Miller and Bromiley (1990) attempted to resolve the paradox by exploring the various measures of risk used in different studies. They grouped organization risk measures used in previous research into income stream risk, strategic or financial risk, and stock returns risk; each measuring a different aspect of business risk. They studied 493 firms over two time periods (1978-1982 and 1983-87) to analyze the effect of risk on future performance and also the effect of performance on the subsequent level of business risk.

Income stream risk relates to operational inefficiencies and is measured through variations in cash flow and accounting return indices. As the variability in an organization's cash flow increases, so does the likelihood that the organization will default on its financial commitments. Uncertain cash flows also inhibit strategic planning activities since future resources levels cannot be accurately predicted. Variations in income make it more difficult to change operations and resource allocations. This could have direct repercussions for many organization functions, since lack of adequate resources may result in further losses, poor performance or even failure. Miller and Bromiley (1990) found income stream risk to be significantly and negatively related to subsequent return on equity and return on assets.

Miller and Bromiley (1990) defined strategic risk as the hazard of bankruptcy measured in terms of a firm's investments in capital, in research and development, and its use of financial leverage. Although these investments are often associated with growth ventures, they also have the effect of increasing fixed costs which potentially increases profit variability. Higher investments in capital also create the opportunity for capital obsolescence - technological advances make achieving a return on previous capital expenditures more difficult. Under conditions of capital obsolescence, a firm could be constrained from reallocating resources to make necessary adjustments which might then have deleterious effect on its profits. Miller and

Bromiley (1990) reported that the relationship between strategic risk and performance (return on equity and return on assets) was negative. Although their results run counter financial theory, Miller and Bromiley found the relationship between strategic risk and return existed across industries.

Stock market risk measures variations in the price of a firm's common stock in relation to general market indices. Systematic risk, or beta, is the amount of price variation in an organization shares that can be explained by changes in the stock market in general. Unsystematic risk, or epsilon, is the amount of variation unexplained after removing beta. In the Miller and Bromiley (1990) study, neither of these risk measures were significantly related to firm performance.

Regardless of the measure, the level of business risk faced by the organization is partially the product of managerial decisions. Consequently, the relationship between risk and compensation policies seems a natural extension of this research, especially since the agency theory and strategic contingency literatures place considerable emphasis on compensation. The basic logic is that greater use of pay forms that are contingent on actual organization returns could also provide the increased flexibility required to weather periods of uncertain cash flows and firm performance. The next section explores the relationship between risk and the use of contingent compensation.

Business Risk and Compensation Decisions

Simon (1951) was among the first to propose a formal structure for the relationship between risk and compensation. Simon modeled the employment relationship as a contract between the employer and employee which stipulates the mutual obligations and reciprocal returns of both parties. He noted that both the employer and employee attempt to structure the contract to protect themselves from uncertainty, thereby introducing risk in the employment

investments in human resources (Ehrenberg & Smith, 1991). This tightens compensation budgets and may induce organizations to design alternative pay policies. Since profits are more volatile, managers might prefer to make a portion of employee pay contingent upon the organization's performance. Here again, greater use of contingent pay might provide increased flexibility assisting the firm through difficult financial situations.

Greater uncertainty about future events also increases the principal's risk regarding the agent's contributions. If the principal has perfect information about future events, actions that will be required of the agent can be more fully specified. When the principal can specify what agent contributions (or behaviors) are required, the principal can pay only if those contributions are made. If, however, the principal has less than perfect information or information that is varied, the principal will be less able to accurately determine what agent actions will be necessary. The principal must leave the choice of action to the agent creating the possibility for shirking; the agent might not exhibit effort that advances the principal's objectives (Eisenhardt, 1989). Because the principal is either unable to determine what employee behaviors are required to achieve business goals or is unable to observe whether the employee engages in these behaviors, there is an increased risk of paying without receiving contributions. By making the employee's pay contingent upon the principal's goals, principals reduce their risk because the expense of compensation is incurred only if the principal's objectives are met. Hence, as business strategists face greater uncertainty (i.e., greater business risk), they are more likely to use variable pay to control costs and ensure that employees' behaviors are aligned with organizational goals (Gomez-Mejia and Balkin, 1992). So, balancing risk and compensation, particularly performance contingent compensation, is important in both agency theory and Simon's view of the employment relationship.

Agency theory also specifies how balancing business risk and compensation affects agents. Agent risk increases as pay becomes more contingent (i.e., variable) on organizational performance; variable pay is more risky than static pay. Since individuals prefer to avoid risk, all

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else equal (March & Shapira, 1989), in a risky situation, agents are likely to choose actions that reduce their exposure to risk. However, actions that reduce an agent's risk are often detrimental to the owner (Fama, 1980; Eisenhardt, 1989). For example, in order to protect their earnings, agents might take short run measures to ensure adequate cash flow to the organization. These short run actions may have deleterious effects on the long-term goals of the principal (Pratt & Zeckhauser, 1984). To prevent agents from choosing such actions, principals can design compensation policies which provide incentives for the agent to choose actions that benefit both parties. Performance based pay is used as a means to induce employees to act in accordance with firm objectives. Agency and strategic-contingent theories specify that organizational risk sets boundaries on compensation decisions through its influence on the form of contractual obligations and returns.

Research Model and Propositions

Higher risk levels means greater uncertainty about future events. In turn, this uncertainty makes it difficult to specify what actions will be required of agents to achieve the organizations' objectives. Thus, organizations facing greater risk (uncertainty) are more likely to use performance contingent compensation to align employee interests with those of the principals. A further benefit is that a portion of the organization's costs will also vary with performance. As a result, organizations are likely to vary the degree of performance based pay in response to risk they face.

Proposition 1:   *Organizations facing higher business risk will exhibit an increased emphasis on variable compensation compared to organizations facing lower business risk. That is,*

$$\frac{\partial \text{Variable Compensation}}{\partial \text{Business Risk}} \equiv y_{jk} = \alpha + \beta_i X_{ijk} + \delta Z_j + \varepsilon_i$$

where, y_{jk} = variable measuring the variability of pay for incumbent k in firm j

X_{ijk} = A matrix of firm and individual control variables

Z_j = An estimate of the firm's business risk level

α, β, and δ are coefficient vectors and,

ε_i = an error term that includes unmeasured causes of the dependent variable.

Conlon and Parks (1988) and Eisenhardt (1989) both use agency and compensating wage differential theories to conclude that agents under conditions of higher risk will require some premium to be paid for accepting greater risk. Research on the determinants of risk behavior also suggests that individuals will agree to greater levels of risk or outcome uncertainty as the potential pay off increases (Sitkin & Pablo, 1992). Following this line of reasoning, as the level of business risk increases, the differential (risk premium) should also increase.

Proposition 2:   *Relatively higher risk business strategies will be associated with relatively higher total compensation levels. Or,*

$$\frac{\partial \text{Total Pay}}{\partial \text{Business Risk}} \equiv y_{jk} = \alpha + \beta_i X_{ijk} + \delta Z_j + \varepsilon_i$$

where, y_{jk} = total pay for incumbent k in firm j

X_{ijk} = A matrix of firm and individual control variables

Z_{ij} = An estimate of the firm's business risk level

α, β, and δ are coefficient vectors and,

ε_i = an error term that includes unmeasured causes of the dependent variable.

Finally, when agency theory conditions are met, organization performance will improve.

In the case of agency theory, this translates into achievement of the principal's objectives. In a high risk situation, variable pay aligns the agent's actions with the objectives of the principal. Therefore, as the agency relationship moves toward optimization, superior organization performance should follow. Equally, the capacity to vary costs allows organizations to commit resources strategically, thereby maintaining a competitive advantage. For high risk firms, the relationship between use of variable pay and performance can be expressed as follows:

Proposition 3:   *A relatively greater emphasis on variable pay by high risk firms will result in superior performance compared to high risk firms that have a lesser emphasis on variable pay. Or,*

$$\text{Firm Performance} \equiv y_{jk} = \alpha + \beta_i \, X_{jk} + \delta Z_j + \theta P_{jk} + \gamma I + \varepsilon_i$$

where, y_{jk} = variable measuring a firm j's annual performance

X_{jk} = A matrix of control variables

Z_j = A lagged measure of firm risk

P_{jk} = A lagged measure of a compensation attribute (e.g., variable pay)

I = An interaction term for risk and variable compensation

$\alpha, \beta, \delta, \theta,$ and γ are coefficient vectors and,

ε_i = an error term that includes unmeasured causes of performance .

Methods and Estimation

Measures of Business Risk.

Two measures of organizational risk were used in our study, income stream risk and strategic risk. Previous research used both ex post and ex ante measures of income stream risk. Ex post measures are based on actual variance in firm financial returns. Commonly, historical

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variation in return on assets (ROA) and return on equity (ROE) are used (Miller & Bromiley, 1990). We measured variance in ROA by taking the standard deviation of the previous five years before tax return on assets as our ex post income stream risk measure.

Miller & Bromiley (1990) and Bromiley (1991) used an ex ante measure of income stream risk. Such a measure differentiates changes in outcomes that can be anticipated or predicted from those that cannot be predicted (Bromiley, 1991). The more unpredictable changes are, the greater the level of risk. Both Miller & Bromiley (1990) and Bromiley (1991) based their ex ante measures of income stream risk on forecasts made by professional stock market analysts. These analysts forecast the earnings of a given firm over specific periods of time. If the forecasts of different analysts do not vary greatly, then the earnings stream of the firm is considered to be more predictable and less risky. Conversely, if the variance in analyst's forecasts is great, then the earnings of a firm is more difficult to predict and, therefore, the returns to the firm are considered to be more risky. Variation in stock market analyst's forecasts has been used in finance research extensively (see Bromiley, 1991 for a more complete discussion). Further, previous research has shown that analyst's forecasts are highly correlated to forecasts made by firm managers (See data from McNichols, 1989 and Hassel & Jennings, 1986 as reported in Bromiley, 1991). This supports the notion that forecasts are a reasonable proxy for risk perceptions of firm strategists.

Following Bromiley, we used stock market analysts' estimates. Forecasts are made on a quarterly basis. Each quarter a given analyst forecasts earnings for several future time periods (e.g., the next quarter, one year, two years, five years) so that each year there are four forecasting periods for a given company. The standard deviation of all analyst's forecasts was computed for each forecasting period. In our study, an annual average standard deviation was taken by averaging the standard deviations obtained from each of the four forecast periods.

Strategic risk was measured by capital intensity which is the ratio of annual capital investments to annual sales (Miller and Bromiley, 1990). Capital intensity measures an organization's reliance on capital, a relatively fixed expense, over labor, a relatively more variable

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expense (Ehrenberg & Smith, 1991). Higher fixed expenses place profits in jeopardy if demand drops or economic conditions turn unfavorable. Higher capital expenditures also increase the risk of capital obsolescence which would result in a loss of competitive advantage. In both cases, organizations assuming greater capital to sales ratios face potentially greater risk than firms assuming lower capital intensity levels. Therefore, a higher capital to sales ratio is considered to be indicative of higher business risk. We estimated capital intensity by dividing annual total assets by annual sales.

Contingent Compensation Measures.

Variable or contingent pay refers to that portion of pay that is dependent upon performance (Conference Board, 1991; Milkovich and Newman, 1993). Although variable pay includes a variety of forms that are not added into base, bonuses are among the most common (Hewitt, 1993; Zenge, 1992). Bonuses are likely to be contingent upon current performance and thus are likely to reflect the uncertainty facing organizations. We specified two groups of compensation measures: those capturing actual practices and those capturing compensation practices. Although a company might have a policy allowing a large bonus (as a percent of base), the firm's actual practice might not mirror the state policy. One measure of actual variable pay is the ratio of bonus-to-base pay derived by dividing annual bonus by annual base for each incumbent surveyed. An organization bonus policy stated the maximum possible bonus (expressed as a percent of base pay). A larger maximum bonus indicates the potential for great variable pay than an organization with a lower bonus cap. Historically, bonuses and other forms of variable pay are extended only to managers. However, as risk or uncertainty increases, organizations appear to be transferring risk to more employees (Hewitt, 1993). This suggests that firms facing higher levels of risk might extend the use of variable pay to more employees. We measured the proportion of employees eligible for variable compensation in two ways. First, we calculated the percent of all employees who are eligible for a bonus and, second, the percent of

all employees who actually received a bonus. These two variables were used as another measure of the degree of emphasis a firm places on variable compensation.

All of the measures described above are related to short-term (i.e., one year or less) variable compensation. We also used one measure of long-term variable compensation. This was a dichotomous variable denoting whether or not an incumbent was eligible for the long-term incentive plan.

Firm Performance.

Two measures of organization performance are commonly used in research on risk and variable compensation: ROE and shareholder return (Abowd, 1991; Miller and Bromiley, 1991; Jensen & Smith, 1990; Ehrenberg and Milkovich, 1990). We followed this convention and included both as measures of firm returns.

Control Variables.

A number of control variables were used to account for organizational and individual factors associated with variations in compensation. Consistent with a human capital theory, we used age and organization tenure as controls for individual factors (Gerhart and Milkovich, 1993; Leonard, 1990).

Firm size has been shown to be related to both pay level and use of variable compensation (Leonard, 1990; Gerhart & Milkovich, 1990). We used annual sales, total assets, and number of employees as controls for firm size. Further, since Miller and Bromiley (1990) note that the effect of strategic risk varied across industries and performance levels, and since Gerhart & Milkovich (1990) showed industry effects on compensation policies related to pay level and variability, we include controls for both industry and firm performance. We used previous year's profits, average ROE for the previous five years, and single digit SIC code indicators as controls.

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Data Sources

We combined three archival data sources for this study. The managerial compensation data was drawn from Cornell's Center for Advanced Human Resource Studies (CAHRS) compensation data base (described in Gerhart and Milkovich, 1992). Data for 209 companies was used over the period 1986 to 1988. Each organization was asked to report data on at least 75 incumbents. The job families included in the database cover a wide range of occupations and include profit center heads, manufacturing, marketing, finance, research and development, engineering, and so on.

Data for the financial analyst's forecasts was obtained from the Institutional Broker's Estimate System (IBES) which collects, stores and analyzes data from over 2,500 professional analysts employed by over 150 firms. These analysts regularly evaluate and provide forecasts for over 3,500 business (IBES, 1992). Analysts make annual and quarterly forecast of a number of firm performance measures, of which predicted earnings was used in this study.

Accounting and financial data were drawn from COMPUSTAT data files (Standard & Poor's, 1992).

Statistical Models

Since the data consisted of pooled cross-sections with multiple observations on each firm, we controlled for serial correlation in the data. We estimated general linear models controlling for random case and cross-section (i.e., time period) effects. Although selection of these controls might reduce the variance in dependent variables left to be explained by covariates of interest, we opted for the more rigorous method recognizing the possibility of constrained values in the resulting coefficients. For analysis of long-term incentive eligibility, we estimated a logitistic regression model.

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Results

Descriptive statistics and a correlation matrix are presented in Table 1. The original firm size variables (assets, profits, sales, profits, and number of employees) are shown rather than the principle components. Moderate correlations between the risk measures were found. The two measures of income stream risk (deviation in analyst's forecasts and deviation in ROA) are moderately and positively correlated ($r = .46$). Hence, the two measures of income stream risk share some information, but most (approximately 80%) of their variance is unrelated. Capital intensity is negatively correlated with income stream risk (r for SD of ROA = -.21; r for SD of analyst's forecasts = -.08). These results are consistent with those reported by Miller and Bromiley.

These data are from large companies and relatively high level managers. Average sales were $2.76 billion and average assets of $2.31 billion. The average number of employees was 21,590. The average base salary was $92,967, with an average bonus of $25,217. The average bonus-to-base ratio was 28% with a minimum of zero and a maximum of 300%.

Surprisingly, bonus policy (maximum bonus as a percent of base) and actual bonuses paid (bonus-to-base ratio) are very weakly related and the relationship is <u>negative</u> ($r = -.05$). This indicates that a firm's policy regarding potential bonus levels may not be a good measure of its actual practice. On the other hand, the policy and practice variables measuring how deep the firm extends a bonus into the organization (percent of employee eligible and receiving a bonus) are highly and positively related ($r = .82$).

The results present rather dramatic evidence which calls into question some of the premises of agency and strategic-contingent theories. While decisions about the level of pay (i.e., base and total pay) and emphasis on variable pay are significantly related to risk, in most cases the relationship is contrary to that predicted by these theories. We did not find a consistently positive relationship between risk and total pay as we expected to find. In fact, depending on how risk is

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measured, there is a negative relationship. Coefficients for the regression of compensation decisions on risk, after removing the effects of control variables, are in Table 2. Higher historical income stream risk (SD of ROA) is negatively related to base pay and total pay (Table 2). The coefficients for base pay (β = -.49, p < .01) and total pay (β = -.84, p < .01) are significant and negative. Future oriented income stream risk (SD of analyst's forecasts) is associated with <u>higher</u> pay levels (Table 2). The coefficients for both base pay (β = .002, p < .01) and total pay (β = .003, p < .01) are positive although lower in magnitude than those for historical risk. Capital intensity (annual assets/annual sales) was not related to pay level. These results suggest that firm's that have experienced higher variability in past income streams have lower pay levels while those expecting future income stream variability tend to have higher pay levels. One explanation is that lower pay levels, that is lower base or total pay, are necessitated by the reduced cash flow associated with historical (or experienced) variability. One the other hand, higher base or total pay levels might be associated with projected (or anticipated) variability as a means of retaining employees during an uncertain period. However, since higher base pay means higher fixed costs, profitability may suffer. Indeed, our results suggest that, regardless of the nature of the relationship, higher risk firms which use higher levels of variable pay experience lower subsequent performance. Higher total pay is related to lower total shareholder return for higher risk firms (Table 4). The significant negative interaction effect indicates risk moderates the pay-performance relationship by reducing the slope of the regression line. We interpret this as the effect of pay level on subsequent performance is conditional on the level of risk. And, risk exerts a negative influence as it increases.

In direct contradiction to agency theory, our results indicate that higher risk is associated with lower emphasis on variable compensation (Table 2). Firms with higher levels of business risk were associated with lower bonus-to-base ratios, the greatest magnitude exhibited by firms with higher historical income stream risk . In addition, higher risk companies appear to set policies which specify a lower emphasis on variable pay. For both practice and policy analyses, the

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coefficients with greatest magnitude were obtained for historical incomes stream risk (βfor practice = -.46; βfor policy = -.51, p <.01). Regression coefficients for the relationship between variable compensation decisions, risk and firm performance are presented in Tables 4 and 5. We analyzed this relationship by including compensation and risk measures plus an interaction term to investigate the joint effect of pay and risk on firm performance. The interaction term allows us to investigate if the relationship between use of variable compensation and firm performance is conditional on the level of business risk. For example, after controlling for other covariates, the relationship between variable pay (bonus-to-base ratio), income stream risk, and firm total shareholder return can be expressed as:

$$[(\beta_{Pay} + \beta_{Interaction} * Risk)Pay] + [Intercept + (\beta_{Risk} * Risk)]$$

(Cohen & Cohen, 1983). Thus, the relationship between use of variable pay and firm performance is conditional on the firm's level of business risk.

Contrary to our expectations, the results indicate that higher levels of risk and higher actual variability are associated with lower firm performance. Where significant, the interaction terms for bonus-to-base ratio are negative across measures of firm performance. These data suggest that high risk firms which follow an agency theory model will experience poorer performance. For firms experiencing income stream risk, the negative relationship between variable pay and performance is increased at higher levels of risk. These results are congruent with Bowman's risk-return paradox in that firms pursuing a higher risk strategy paradoxically exhibit lower performance. Miller and Bromiley (1991) report similar findings for income stream risk.

Greater capital intensity (i.e., higher strategic risk) does not moderate the relationship between firm performance and contingent pay. Although greater use of variable compensation is associated with lower firm performance, it is not conditional on the level of capital intensity. Even so, the results again argue against agency and strategic-contingent theory predictions by suggesting that use of variable pay by high risk firms results in lower firm performance (Tables 4

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& 5).

Our analyses also suggest that higher levels of business risk are associated with differences in emphasis on long-term incentives. In Table 3, the results of the logistic regression of long-term incentive plan eligibility on risk indicate that higher levels of income stream risk are associated with a lower probability of being eligible for the long-term incentive plan. On the other hand, strategic risk is associated with a higher probability of being eligible for long-term incentives. This limited evidence suggests that long-term based pay might be associated with risk differently than short-term bonuses. A recent consultant's survey corroborates this possibility; it reports that higher performing firms decrease emphasis on short-term variable compensation and increase use of long-term variable compensation (KMPG Peat Marwick, 1993).

The data are less convincing about how risk is related to the proportion of employees covered by short-term variable pay (dispersion of performance contingent pay). Only historic variation in income stream was significantly related to dispersion of contingent pay. However, contrary to our expectations, firms experiencing higher risk levels also extend variable compensation to proportionately fewer employees (Table 2). Across risk variables, the coefficients for percent of employees eligible for a bonus are significant and negative (Table 2). An agency theory view of higher risk firms is more congruent with decisions which extend performance based pay to more agents to align these agent's behavior with firm objectives. However, the preponderance of the data suggest that extending variable compensation to a greater proportion of employees among higher risk firms is associated with lower performance (Tables 4 & 5). Higher projected income stream risk combined with a greater proportion of employees actually receiving a bonus is associated with lower firm performance as is the relationship for greater historical income stream risk. For capital intensive firms that extend bonuses to more employees, greater risk is associated with better, although still negative performance. Like with the amount of variability in compensation, the level of business risk appears to moderate the relationship between pay decisions and firm performance.

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Discussion

One study does not refute a theory. Nevertheless, our results raise serious questions about the predictions made by strategic-contingent and agency theories regarding variable pay. Our results strongly suggest that organizations facing higher risk do not place greater emphasis on short-term variable pay, indeed they place less emphasis on it. And most surprisingly, those high income stream risk firms which do use variable compensation experience poorer firm returns. The data provided evidence contrary to all three propositions we made based upon agency and strategic-contingent theories. We believe our study highlights the need to delve deeper into the entire employment relationship to gain a better understanding of how the parties react to risk. We recognize that this belief goes beyond the data, but it does offer possible explanations for them.

We infer that our results indicate that the predictive power of both agency and strategic-contingent models might be enhanced by a multi-dimensional view of risk. Since some of the results differ depending on how risk was measured, it is possible decisions makers might react differently to different sources of risk. A better understanding of the conditions under which agency predictions hold may be gained by examining different sources of risk and how they are related to compensation decisions.

We suggest that agency and strategic-contingent theories as typically described tell only part of the story. That is, principals might act to align agent behaviors through the use of variable pay schemes, but its effect on an agent's behavior may be more complex than typically proposed by agency theory. Perhaps greater risk imposes greater uncertainty in the employment relationship and firms reduce (rather than increase) the variability in pay to offset this increased risk (Simon, 1951). In addition to concerns about risk in pay, agent behaviors might also be influenced by perceptions about other sources of risk in the employment relationship including employment security. Recent research on psychological employment contracts indicates

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employees are concerned about the length of the employment relationship among other conditions (Rousseau, 1990). We need to know more about how employees process risk in the employment relationship, especially risk related to pay and other general employment factors like loss of employment, risk of a lay-off, loss of promotability, or chances for unfavorable assignments. Furthermore, we need to learn how these perceptions are formed, what their antecedents are, how these perceptions influence work-related behaviors and attitudes, and what conditions moderate these relationships. We believe our results are sufficiently strong to suggest that gaining a greater understanding of how employees process and react to risk will add greatly to the predictive power of agency and strategic-contingent theories.

Our study is the first to test the predictions agency and strategic-contingent theories make about the relationship between risk, pay, and firm performance. But it is not without its limitations. First, the data were drawn from larger companies in the U.S. Smaller, more entrepreneurial businesses would provide another, perhaps unique data source for analyzing the relationship between risk, compensation and firm performance. Entrepreneurial firms are often considered to be high risk, high growth potential ventures and, therefore, may offer a different context in which to test agency theory predictions. Our measures of variable compensation were predominantly short-term pay measures. Long-term pay practices could also provide another dimension for investigation of the risk, compensation, performance relationship. In fact, it has been suggested that variable compensation based on long-term measures has greater strategic advantage than short-term measures (Bloedorn, 1993; Hewitt, 1993).

Our data did not provide information about the actual measures upon which performance contingent pay was based. If principals do attempt to align agent behaviors through performance-based pay, the basis for payment of the variable compensation is important. Our study provides some indication of this 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

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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 and strategic-contingent models. Simply assuming a risk averse agent may not capture the full range of attitudes, and it may not adequately specify how agents react to risk, especially risk from different sources. Providing policy makers with more information about how employees react to risk in the employment relationship, especially risk related to compensation, would assist them in making better decisions regarding how pay can support overall business objectives.

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Table 1: Descriptive statistics and correlation matrix

Variable	Mean	S.D.	1	2	3	4	5	6	7	
1. Analyst's forecast	8.48	10.61								
2. Capital intensity	.95	.51	-.08**							
3. S.D. of ROA	.029	.021	.46**	-.21**						
4. Base salary[a]	11.44	.50	.10**	-.08**	.05**					
5. Bonus-to-base ratio	.28	.20	.09**	.05**	-.15**	.54**				
6. Total pay[a]	11.68	.59	.13**	.13**	-.05**	.98**	.69**			
7. Maximum bonus (% of base)	68.90	61.12	.04**	.12**	-.03**	.08**	.07**	.08**		
8. Total shareholder return	.16	.26	-.12**	-.07**	.08**	-.04**	-.006	-.04**	-.009	
9. Profits[a]	11.71	1.34	.17**	.24**	-.09**	.34**	.27**	.35**	.11**	-.06**
10. Sales[ab]	14.80	1.08	.29**	.10**	-.09**	.34**	.27**	.36**	.04**	-.06**
11. Equity[a]	13.75	1.16	.16**	.32**	-.15**	.38**	.23**	.38**	.10**	-.07**
12. Assets[a]	14.65	1.21	.23**	-.15**	.41**	.37**	.24**	.38**	.09**	-.08**
13. Number of employees[ab]	9.98	1.14	.09**	.05**	-.15**	.30**	.27**	.32**	.10**	-.05**
14. 5-year average ROE	13.80	6.37	.08**	-.08**	-.006	.02**	.16**	.05**	-.13**	.04**
15. Return on equity	.15	.13	.002	-.06**	.16**	.008	.04**	.02**	.03**	.19**
16. Number of reporting levels from BOD	4.15	1.30	.07**	-.08**	.03**	.61**	.34**	.60**	-.03**	-.009
17. Age	54	8.31	.04**	-.01**	.03**	.38**	.22**	.38**	.02**	.006
18. Firm tenure[c]	71.36	10.14	.07**	-.01**	.02**	-.23**	-.16**	.23**	.02**	-.02*
19. % of employees eligible for bonus	.048	.13	.29**	.003	.04**	-.04**	-.07**	-.05**	-.02**	-.06**
20. % of employees receiving a bonus	.036	.11	-.04**	.04**	-.07**	-.01**	-.03**	-.04**	-.01	-.03**

* p < .05
** p < .01
[a]Measured as the natural log
[b]Data was measured in 1,000s
[c]Data was measured in months

Table 2: <u>Results of regressing variable compensation measures on strategic risk</u>
    (Standard errors in parentheses)

Pay Characteristic	Pay Level		Variable Pay Policies		Variabile Pay Practices	
Risk Measure	Base Pay	Total Pay	Maximum Bonus (% of Base Pay)	Percent of Employees Eligible for Bonus	Bonus-to-Base Ratio	Percent of Employees Receiving a Bonus
Standard Deviation of Analyst's Forecasts	.002** (.0007)	.003** (.0009)	-.005*** (.00001)	-.0005** (.0001)	-.0008** (.0004)	NS
Standard Deviation of 5-year Return on Assets	-.49** (.22)	-.84** (.26)	-.51** (.04)	-.46** (.03)	-.40** (.09)	-.31** (.04)
Capital Intensity	NS	NS	-.02** (.005)	-.03** (.003)	-.03** (.01)	NS

* $p < .05$
** $p < .01$

Table 3: Logistic regression results for eligibility for long term incentives on risk measures
(Standard errors in aprentheses)

Risk Measure	Eligibility for Long-term Incentives
Standard Deviation of Analyst's Forecasts	-.022** (.002)
Standard Deviation of 5-year Return on Assets	-6.02** (.70)
Capital Intensity	.47** (.044)

* p < .05
** p < .01

Table 4: <u>Relationship between high risk firms and pay policies on total shareholder</u>
(Standard errors in parentheses).

	Regression Coefficients			Regression Coefficients			Regression Coefficients		
	Compensation Measure	Standard Deviation of Analyst's Forecasts	Int	Compensation Measure	Standard Deviation of ROA	Interaction	Compensation Measure	Capital Intensity	Interaction
Total Pay	-02** (.004)	NS	-.0006** (.003)	-.01** (.004)	2.63** (1.17)	-.36** (.10)	-.02** (.005)	NS	NS
Bonus-to-Base Ratio	-.07 (.01)	-.006** (.004)	NS	NS	-1.11** (.0001)	-1.79** (.31)	-.07** (.01)	.06** (.009)	NS
Percent of Employees Receiving a Bonus	-.003** (.006)	.22** (.05)	-.04** (.006)	.73** (.40)	NS	-54.56** (1.69)	-.64** (.06)	.16** (.008)	.39** (.06)

* $p < .05$
** $p < .01$

Table 5: <u>Relationship between high risk firms and pay policies on return on equity</u>
(Standard errors in parentheses)

	Regression Coefficients			Regression Coefficients			Regression Coefficients		
	Compensation Measure	Standard Deviation of Analyst's Forecasts	Interaction	Compensation Measure	Standard Deviation of ROA	Interaction	Compensation Measure	Capital Intensity	Interaction
Total Pay	NS	NS	NS	NS	2.14** (.002)	NS	NS	-.04** (.02)	NS
Bonus-to-Base Ratio	.02** (.005)	-.0005** (.0002)	-.002** (.0003)	-.01** (.004)	1.65** (.06)	NS	NS	-.02** (.003)	NS
Percent of Employees Receiving a Bonus	.20** (.02)	.001** (.0002)	-.03** (.0008)	-.25** (.01)	1.09** (.06)	17.20** (.66)	.15** (.02)	-.02** (.003)	-.10** (.02)

* $p < .05$
** $p < .01$