

DISENTANGLING COMPENSATION AND EMPLOYMENT RISKS USING THE BEHAVIORAL AGENCY MODEL

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Employing survey and archival data from a sample of IPO firms, and extending the ideas of the Behavioral Agency Model, this study examines the influence of various forms of risk bearing created within the compensation contract on perceived risk taking. The results show that employment risk and variability in compensation each corresponds to greater risk taking, while downside risk and the intrinsic value of stock options correspond to lower risk taking. Among the implications from these results are the importance CEOs attach to relatively stable forms of pay, and to drawing distinctions between the potential for loss of pay and uncertainty about the amount of future pay. Copyright © 2007 John Wiley & Sons, Ltd.

In response to both a growing debate over the influence of contingent pay on CEO behavior (see Beatty and Zajac, 1994) and the lack of consistent empirical findings regarding the association between CEO compensation and firm performance (see Gomez-Mejia, 1994), Wiseman and Gomez-Mejia (1998) developed the Behavioral Agency Model (BAM). Their theory of executive compensation combines elements of agency theory with behavioral views of decision making under uncertainty in order to re-examine what is meant by compensation risk and how this risk influences

executive behavior. Central within their model are the concepts of risk bearing and risk taking.

This study extends their model in several ways. First, beginning with their definition of agent risk bearing as perceived loss of wealth, we reflect on what is meant by wealth in the context of compensation design and argue against viewing all income as fungible. Second, we explore two sources of risk bearing—compensation risk and employment risk—in order to show how their influences on agent risk preferences differ. Viewing agent risk bearing as the potential for loss of wealth also leads us to argue for a distinction between risk bearing as downside loss and uncertainty regarding future pay (see Miller and Leiblein, 1996). Although compensation research has given considerable attention to the degree of uncertainty about future pay, we suggest that uncertainty about pay

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has an effect on agent risk preferences independent of the potential loss of pay. Finally, we offer an approach to capturing risk preferences as reflected in a firm's strategic initiatives that encompasses both the actions taken and the decision-maker's perception of risk in taking those actions. Capturing the decision-maker's assessment of risk is critical to distinguishing between intentional and unintentional risk taking, and distinguishes this measure from proxies that focus on a single action that may or may not be perceived as risky.

THEORY AND HYPOTHESES

Compensation researchers generally equate unpredictability of future earnings (with measures such as the proportion of variable pay in the pay package) with agent risk bearing (see Gomez-Mejia and Wiseman, 1997, for a review). The behavioral agency model challenges this view by suggesting that agent 'risk bearing' only occurs when there is a threat to the agent's wealth. Under BAM, pay is divided into essential and nonessential elements depending on its reliability. Pay which is consistently paid over time, such as base salary, is likely to be used to support one's standard of living. Conversely, pay that is inconsistently received over time, such as the amount one might realize from exercising stock options in any one year due to fluctuations in the stock price, is unlikely to be used to support basic living expenses (such as paying the mortgage) precisely because it is an unreliable source of income from one period to the next. Hence, according to BAM, only anticipated essential pay (which presumably is highly reliable) is likely to be endowed by agents as part of their wealth (Strahilevitz, 1992).

While base pay is widely regarded as reliable going forward (e.g., lending of 30-year home mortgages are based on this assumption), there is still some uncertainty surrounding the precise amount of future base pay which results in uncertainty about the buying power of that pay to support or raise one's standard of living. On the one hand, agents may face temporary or permanent changes in pay structure (as has been the case in much of the airline and automobile industry in recent years). More often, however, uncertainty about future base pay reflects variance in cost-of-living increases, market adjustments, and merit pay raises

over time. Uncertainty about the size of these upward adjustments may create uncertainty about the ability of base pay to maintain or even raise one's standard of living. Mandatory renegotiation clauses of base pay at stipulated intervals (normally every 3–5 years), which are often included in executive compensation contracts, compounds this uncertainty. In addition, some forms of pay, such as annual cash bonus awards, which are often classified as variable, exhibit considerable consistency from year to year. Although the precise bonus amount awarded from one year to the next may vary, there is often sufficient consistency in these payments over time to create the impression of reliability, while still carrying a degree of uncertainty about the precise amount. This point challenges prior research on compensation which has generally classified pay into discrete categories of 'fixed' and 'variable.' Instead, our argument erases this arbitrary distinction and suggests that all forms of pay are subject to some level of uncertainty. Understanding the role of this uncertainty on risk preferences may be best considered by examining the research on decision making under uncertainty (e.g., Tversky and Kahneman, 1992).

A considerable amount of research on choice behavior has generally found that risk preferences are strongly influenced by the framing of prospects as gains or loss and the probabilities attached to those anticipated gains and losses (Kahneman and Tversky, 1979; Tversky and Wakker, 1995; Wakker, 2003). This pattern has been observed in numerous studies (see meta-analysis by Kühberger, 1998). Corresponding to this research, individuals facing a loss of wealth become increasingly risk seeking as the probability of the loss rises. Conversely, individuals anticipating a gain to wealth become increasingly risk averse with increases in the probability of anticipated gains (see Tversky and Kahneman, 1992). Since individuals tend to weigh losses more than equivalent gains, the more assured an anticipated gain is perceived, the less willing individuals are to risk that gain in pursuit of additional wealth. A key implication of these findings is that individuals often willingly sacrifice significant upside potential in order to protect highly probable gains (Kühberger, 1998).

Given that essential pay is presumably assured relative to other forms of compensation, we expect individuals to frame essential pay in the realm of gains. The variability over time of previously

awarded essential pay is likely to be a barometer for future variability and thus reflects the inverse of the probability of receiving essential pay. If essential pay is relatively stable (e.g., increases with inflation every year or keeps up with 'going labor market rates' as obtained from periodic salary surveys; Gomez-Mejia, 1992), agents are more prone to view the value of such future pay as highly probable and vice versa. This logic corresponds to behavioral research on choice behavior, which finds that the probability (or conversely the variability) surrounding future gains does influence risk propensity (Tversky, Slovic, and Kahneman, 1990; Tversky and Wakker, 1995).

Conceptually, variability combines both the potential losses to compensation as well as potential gains. This creates a potential conflict between the motivation to protect against downside loss through conservative behavior, and the incentive to take full advantage of upside potential through maximizing behavior. However, assuming individuals weigh potential losses more than equivalent gains (Tversky and Wakker, 1995), then they may be more inclined to protect highly probable gains rather than seek to increase the size of those gains. Conversely, when gains are less certain, individuals may be more inclined to maximize anticipated gains by taking on more risk. Thus, assuming that the perceived variability in essential compensation reflects the probability of anticipated pay, higher variability in essential pay will correspond to greater risk seeking in making decisions on behalf of the firm.

Hypothesis 1: Variability of essential compensation should exhibit a positive association with CEO risk taking.

In addition to variability, essential pay also faces downside risk. For example, if cash bonuses are paid consistently during extended munificent economic periods (such as in the United States during the 1990s) recipients may attach an expectation of reliability to these bonus payments, creating the characteristics of essential pay that is then used to support one's standard of living. If so, deteriorating economic conditions or firm performance might lead to the loss of these awards. If recipients recognize this possibility, they may anticipate the loss of this pay separately from perceptions of uncertainty about the size of future payments. Thus, downside

risk is distinguished from variability in that it captures the potential for losing something of value, while variability captures fluctuations in the future size of that value. Recognizing this distinction corresponds to behavioral research on choice behavior (Tversky *et al.*, 1990; Wakker, 2003).

Clearly threats to some portion of essential pay (or anticipated raises in this pay) are likely to be especially salient since its loss represents a threat to one's standard of living. When recent experience leads CEOs to perceive increased threats to this pay, we would expect them to seek ways to reduce this risk exposure. This prediction corresponds to arguments suggested by Shapira (1995), who proposes that executives tend to focus on the loss potential of an outcome distribution when considering alternative courses of action. Thus, downside risk exposure to essential pay corresponds to the potential of losing a portion of pay critical to maintaining the executive's standard of living. This risk exposure may result from a variety of sources, including exogenous factors such as an economic downturn and the executive's own missteps. This differs from loss contexts in which executives anticipate losing wealth and thus seek to reverse this anticipated loss through risk-seeking actions (Kahneman and Tversky, 1979). Downside risk in the realm of gains represents a possibility of a loss that could be reduced by avoiding actions that would aggravate this risk. In particular, we predict that perceptions of downside pay risk are likely to encourage risk aversion in the selection of firm strategy in order to limit this potential threat to anticipated pay viewed as essential by the executive. Formally:

Hypothesis 2: Downside risk of essential compensation negatively associates with CEO risk taking.

A related but different source of CEO's risk bearing, and hence influence on CEO behavior, is employment risk. Several authors (e.g., Berger, Ofek, and Yermack, 1997; Bloom and Milkovich, 1998) have noted the influence that a CEO's employment risk may exert on the CEO's subsequent behavior, since the threat of dismissal seriously jeopardizes the CEO's future income (Fama, 1980; Jensen and Murphy, 1990). For one, the taint of being fired can have a negative effect on reputation and thus can seriously threaten future

prospects (Amihud and Lev, 1981; Agrawal and Mandelker, 1987). For example, Mehran, Nogler, and Schwartz (1998) observe that only a few CEOs are able to find a comparable position after presiding over the liquidation of a firm. Put another way, the anticipated rent for the CEO due to the employment relationship decreases as employment risk increases. Analogously, Eckbo and Thorburn (2003) document large income losses of CEOs of bankruptcy-filing firms *vis-à-vis* CEOs of nonbankruptcy-filing firms. Thus, employment risk represents an even more severe threat to wealth than either form of compensation risk.

Although Wiseman and Gomez-Mejia (1998) do not delve into the specific mechanism linking employment risk to agent risk taking, we can construct an argument regarding employment risk based on their discussion of risk bearing. From BAM's perspective loss contexts reduce an agent's risk bearing, thereby promoting greater risk taking (see Sitkin and Pablo, 1992). Since termination results in the complete loss of all current income and puts in serious jeopardy all future income, employment risk represents the ultimate threat to a CEO's wealth. This is likely to compound a loss context for the CEO. Consistent with BAM's view that anticipated losses can trigger increased risk taking, we would expect CEOs to respond energetically to perceived increases in employment risk by augmenting their preference for risk. This view corresponds to research on choice behavior regarding risk such that, as the probability of loss increases, individuals tend to increase their risk-taking behavior (Tversky and Wakker, 1995). Formally stated:

Hypothesis 3: Employment risk exhibits a positive association with risk taking.

Nonessential pay includes a variety of forms (e.g., equity vs. cash) each having different characteristics. The most common form,¹ stock options, represents a special class of contingent compensation with unique properties not found in other long-term incentive pay. Practitioners and scholars alike have long defended that stock options may be an efficient way to align the interests

¹ Although restricted stock is becoming increasingly popular (45% of CEOs in 2005 received restricted stock awards), stock options remain the most popular form of stock-based pay (in 2005 75% of CEOs received stock options).

of CEOs with those of shareholders (e.g., Fama and Jensen, 1983). This occurs since options directly link a portion of CEO wealth to the stock price of the firm (Haugen and Senbet, 1981; DeFusco, Johnson, and Zorn, 1990), while simultaneously limiting the CEO's downside exposure relative to that of equity ownership (Sanders, 2001). If the firm's stock price rises (regardless of cause), the CEO's options gain in value, while falling stock prices reduce option value but not actual CEO wealth (since, unlike stock ownership, the CEO has invested no wealth into the ownership of the option). As with contingent pay in general, empirical examinations of stock option influences on risk taking appear mixed and inconclusive (see Agrawal and Mandelker, 1987; Defusco *et al.*, 1990; Defusco, Zorn, and Johnson 1991; Rajgopal and Shevlin, 2002; Sanders, 2001).

BAM offers a new perspective to analyze the role of stock options. Specifically, BAM stresses the important role that the 'intrinsic value' of unexercised stock options may play in determining the risk-taking posture of the CEO. Building on the concept of 'instant endowment' (Thaler and Johnson, 1990), BAM defends that, regardless of the source of that wealth creation (CEO induced or the result of market fluctuations), the value of options may be instantly endowed into calculations of personal wealth. Wiseman and Gomez-Mejia (1998) argue that a portion of the current value of positively valued stock options, like that of owned stock, becomes part of perceived current wealth.

Stock options granted to a CEO normally have an exercise price (determined on the day of the grant) which determines the price at which the CEO may purchase stock at some future date (Hall, 2000). Due to this characteristic and to the long-term horizon of stock option plans (normally 10 years according to Murphy, 1999), CEOs should expect a high probability that their options will finish with a positive pay-off with likelihoods as high as 0.80 and higher in some studies (Lambert, Larcker, and Verrecchia, 1991; Hall and Murphy, 2002). The probability of a positive pay-off would be even higher if we take into account the possibility of repricing 'underwater' stock options. Buttrressing these findings, the business press reports that even in a bear market CEOs of *Fortune* 500 firms consistently enjoy positive returns from these plans (Lavelle, Jespersen,

and Arndt, 2002; Lavelle *et al.*, 2003; Prasso and Lavelle, 2003).

As option value rises we expect CEOs to incorporate this value into calculations of personal wealth in anticipation of exercise. If true, then loss-averse CEOs should prefer strategies that protect option value over strategies that, while promising increased option value (and thus increased wealth), also increase the chances of reducing this value. Said another way, as the value of stock options rises CEOs will pursue lower-risk strategies that protect stock option value over value maximizing strategies that could place the current value at increased risk.

Hypothesis 4: Unexercised, positively valued stock options negatively associate with CEO risk taking.

METHODS

Sample and data collection

Data for this study came from firms issuing an initial public offering (IPO) of stock from 1993 to 1995. This sample is superior to typical 'Fortune 500' samples for studying the influence of compensation design on risk taking because IPOs tend to show a wider range of risk which provides greater variation in 'key risk-bearing aspects of management compensation contracts' (Beatty and Zajac, 1994: 315). Further, IPOs present a higher dependence on CEO preferences. Smaller size and less well-established organizational routines and behaviors (in part because IPO firms are commonly young; MacCrimmon and Martens, 1999) increase the influence of the top management team and in particular the CEO on organizational objectives and strategic choices. Lastly, the theoretical notion of essential vs. nonessential expenses apportioned from one's income may be more meaningful in this sample. CEOs in our sample earn a median income of \$364,000 a year vs. an income of \$10 million plus among their counterparts in Fortune 500 firms (Reingold, 2000).

The CEOs of the firms that went public in the 1993–95 period were surveyed during the third and fourth quarters of 1998. Surveys of chief executive officers are notorious for low response rates, often around 10 percent (see Matsuda, Vanderwerf, and Scarbrough, 1994; Welbourne and Wright,

1997). We took several steps to achieve the highest response rate possible (Forsythe, 1977; Fowler, 1993). First, we pretested the survey in order to make the questionnaire more appealing and easier to complete. Next, we mailed the survey to the CEOs of all 1184 firms issuing IPOs from 1993 through 1995. The survey was accompanied by a cover letter that linked the current investigation with an ongoing series of studies being conducted on IPO firms by a research team at an Ivy League school in which many IPO firm members had previously participated. Nonrespondents were telephoned and mailed a second survey within 40 days of receiving the first. 108 CEOs eventually responded, giving us a response rate of 9.25 percent. This response rate is consistent with previous studies involving IPO firms (Welbourne and Wright, 1997).

Since nonresponse bias is a likely concern with a low response rate, we conducted several statistical comparisons between respondents and the population. First, we compared the characteristics of our sample against 5000 randomly drawn samples of 108 firms each taken from the full IPO population. The empirical distribution derived from these 5000 random samples allowed us to test the hypothesis that our sample differed from a sampling of truly random samples using the 'percentile method' (Mooney and Duval, 1993). We found no significant differences in firm sales, total assets, number of employees, return on assets, return on equity, earnings per share, long-term debt, or total liabilities, which supports the random nature of our sample. Second, we ran single mean pair comparisons for several known firm characteristics including assets, number of employees, and revenues. We found no significant differences between our sample and the population on any of these characteristics. Third, using a χ^2 independence test we found no differences in the distribution of SIC codes and sales between our sample and the population of IPO firms. Fourth, we ran a Kolmogorov–Smirnov two-sample test to assess whether significant differences exist in the distribution of respondents and nonrespondents for all known variables (e.g., firm sales and ROA), including differences in central tendency, dispersion, and skewness (Siegel and Castellan, 1988). Again we found no significant differences.

Finally, we considered the possibility that potential nonresponse bias may not be revealed by testing for differences in firm characteristics, but

instead in how CEOs responded. To check for this, we ran two tests. Following recommendations by Armstrong and Overton (1977), and Subramani and Venkatraman (2003), we compared the surveys of late responders to those who responded early to our request. This test identified four significant differences at $p \leq 0.05$ in the mean responses between the early and late responders among 69 variables compared. In the other test we compared responses between IPO years. That is, we compared responses from CEOs whose IPO occurred in one of the three years with the responses of CEOs whose IPO occurred in each of the other two years. Again, only a handful of items were statistically different (falling within what would be expected from chance) and showed no discernible pattern. Based on this evidence we are reasonably confident our sample is representative of the population.

The typical respondent in the sample was a 51-year-old male, the CEO of the firm at the time of the IPO and had more than 8 years' experience in the IPO firm. The final sample contained firms from 49 industries at the two-digit Standard Industrial Classification (SIC) level. No industry (two-digit level) accounted for more than 17.5 percent of the sample. Firm size ranged from 10 to 10,000 employees with an average size of 928, and a median size of 337 employees.

Measures and analysis

This study combines archival with survey data. Survey measures of risk taking and employment risk were developed specifically for this study. Archival data from firm proxy statements were used to measure CEO age and compensation, including pay and stock options. Financial information (including firm performance, size, and so forth) was obtained from Computstat and CRSP data.

Risk taking

Risk taking reflects the CEO's choice of investment risk from among the firms' investment opportunity set. For this study, we are concerned with measuring the degree of overall strategic risk a CEO knowingly accepts when deciding to increase or decrease investment in various strategic alternatives. In other words, we are concerned with an overall risk profile resulting from the pursuit

or rejection of various strategic options available to firms. It is our view that no single dimension (such as R&D investment) can adequately capture overall risk propensity since CEOs have a variety of alternatives from which to choose (e.g., acquiring other firms, entering new markets, developing new products), and their choice of a strategic option may not be independent of other choices. This is because increased use of one strategic risk may be offset by reductions in other strategic risks (see Wiseman and Catanach, 1997). Alternatively, avoiding a risky strategic alternative may not be due to risk aversion, but to limits in managerial discretion regarding that alternative (Hambrick and Finkelstein, 1987). Finally, focusing on a specific strategic alternative to measure risk taking presupposes that the decision-maker shares the researcher's assumption about the riskiness of the alternative being measured. In other words, using a specific strategic alternative ignores differences in market power or industry conditions that could influence actual (and thus perceived) risk to the firm from any given strategic action. That is to say, risk is likely to be idiosyncratic for each firm, making universally applied indicators of strategic risk misleading.

Broad firm-level measures of risk (such as variance in returns or in stock analysts' forecasts) are also problematic since these measures not only capture the effects of strategic adjustments but also the effects of exogenous industry factors (Palmer and Wiseman, 1999). Thus, firm-level measures of income uncertainty provide weak proxies of strategic choices involving risk. To avoid these problems we developed and validated a measure of strategic risk that extends a measure developed by Khandwalla (1977) and later used by Singh (1986). Our approach avoids limiting the choice of strategic actions to one or two options (which may not be appropriate for all respondents), focusing on the use of specific strategic alternatives rather than on distal outcomes of these actions such as income uncertainty, and, unlike Khandwalla or Singh, allows respondents to determine the riskiness of each strategic action to their business (rather than imposing a universal standard of risk). The latter is critical to capturing preferences for risk since the only way to correctly interpret whether an action is risk seeking or risk avoiding is to determine whether the actor perceived the action as risk increasing or risk decreasing.

Our measure of strategic risk combines six strategic dimensions suggested by Khandwalla (1977), along with several more strategic actions firms may pursue based on a review of strategy research and interviews with managers about what strategic actions they took. These dimensions were pretested on 69 members of an executive MBA class at a leading university in the Western United States. Our pretest revealed that a subset of items were judged by a majority of respondents as indicators of risk taking, were consistently rated on the degree of their riskiness to the firm, and appear to capture different aspects of risk taking as shown by exploratory factor analysis. It confirmed our suspicion that no single dimension would provide a good proxy for capturing the firm's strategic risk profile. Based on these results, we selected nine items to capture strategic risk: (a) R&D; (b) entry into a new product-market; (c) manufacturing or process innovation; (d) product innovation of an existing product; (e) capital investment in property, plant, or equipment; (f) downsizing through layoffs; (g) increasing long-term debt; (h) acquisition of a business in an unrelated industry; (i) increasing promotion and advertising.

For the study, CEOs were asked to rate each item on a seven-point scale (1 = very low risk; 7 = very high risk) 'the extent of risk your firm faces (e.g., if things do not turn out well, the strategy could lead to major losses) from increasing your investment in each strategic action.' CEOs were then asked to rate on a seven-point scale (1 = never used; 7 = frequently used) the 'extent to which your firm engages (i.e., invests) in each strategic action.'

Using a split-sample agreement procedure, we found that two randomly drawn subsamples of CEOs ($N = 54$ each) produced nearly identical results in terms of the perceived riskiness of the nine strategic actions. None of the differences between the nine pairs of response means were found to be statistically different between the two random samples. Further, the correlation between the subsample means for the nine items reached 0.91 ($p \leq 0.000$). In other words, there was a remarkably high degree of agreement among independent CEO raters as to which strategic actions were of higher or lower risk. This high inter-rater agreement contrasts with the expectedly lower Cronbach's alpha of 0.51 for an intra-rater test of inter-item reliability. The lower alpha coefficient is

not surprising in this case because it supports our view that the nine items selected capture different dimensions of strategic risk.² To further check on the discriminant validity of the nine items, a mean comparison across items within each subsample showed that most of the mean differences between each item and every other item reached statistical significance of at least $p \leq 0.05$ (specifically, 33 out of 36 inter-item mean comparisons in subsample one, and 32 out of 36 inter-item mean comparisons in subsample two). This indicates that CEOs not only agreed on which actions were riskier but also that they could clearly differentiate between the relative risk of one action vs. another (i.e., high discriminant validity). The risk of various strategic actions, in descending order of magnitude, are as follows: acquisition of businesses in unrelated industries; entry into new markets; downsizing through layoffs; capital investment; increase long-term debt; increase promotion and advertising; innovation of an existing product; manufacturing or process innovation; and R&D.³

Using these nine strategic actions we constructed a composite index for each firm i to represent CEO risk taking by multiplying the 'usage' score for each strategic action j by its 'risk' score and averaging these products across all nine items (see formula). Composite measures are justified when the construct of interest is at a macro level of analysis, such as with group research where the construct of interest may be an average of uncorrelated individual scores (e.g., Stoner, 1968; Chen, 1998) or when the indicator variables reflect multiple dimensions or facets of a latent construct (see Law and Wong, 1999), and thus are meant to complement one another (Doz, Olk, and Ring, 2000; Jarvis, MacKenzie, and Podsakoff, 2003; Boyd, Gove, and Hitt, 2005). Mathematically, this index was calculated as follows:

$$\text{Risk taking}_i = \sum_{j=1}^9 (\text{Usage}_{ij} * \text{Risk}_{ij}) / 9$$

² Such low Cronbach alpha values, between 0.5 and 0.6, are common for composites that approach multidimensional constructs. See, for example, Khandwalla (1977), Gupta and Govindarajan (1984), Singh (1986), Finkelstein and Hambrick (1990), or Van de Ven and Ferry (1979).

³ Note that the low risk attributed to R&D conflicts with studies that use R&D as a proxy for risk taking (e.g., Hoskisson, Hitt, and Hill, 1992).

Greater usage of high-risk actions produces a higher value, while greater usage of lower-risk actions or minimal usage of high-risk actions produces a lower value. We report only the findings pertaining to this risk-taking composite rather than a fine-grain analysis of its constituent elements. Results examining individual constituents (available from the authors) as well as three factors produced from a factor analysis of the nine risk dimensions led to substantially lower model fit. These findings suggest that a composite score provides a superior measure of overall strategic risk posture than looking at any subset of risk dimensions.

Downside risk of pay

We measure downside compensation risk as the degree to which each of five forms of compensation is at risk of loss. Borrowing an index of pay used by Tosi and Gomez-Mejia (1989), we examine the downside risk to five types of compensation: annual base salary; raises and adjustments to base salary; annual cash bonuses; long-term cash compensation (cash awards based on long-term performance—more than one year); and long-term non-cash compensation (stock-based awards based on long-term performance—more than one year). For each item we asked CEOs to indicate ‘the extent to which each type of pay has faced a chance of loss since the IPO.’ Responses were made on a six-point scale (1 = no downside risk to my pay; 6 = extremely high downside risk to my pay). The split sample analysis, conducted in the same manner as described earlier, shows that there is a high degree of agreement as to the relative downside risk of the five types of compensation. None

of the differences among the five pairs of means between two randomly drawn samples of equal size ($N = 54$) reached statistical significance. The correlation for the two sets of five means between the two subsamples reached 0.978 ($p < 0.001$). On the other hand, a pair comparison of the five sets of means across the five items within each sample shows that all of the mean differences were statistically significant, indicating high discriminant validity. The downside risk of the various pay items in descending order are: long-term non-cash compensation; bonuses; long-term cash compensation; adjustments to base pay; and base pay.

Next, we created a downside risk measure that combines the downside risk ratings across the five forms of compensation weighted by the allocation of each k type of compensation. To gauge allocation, we asked CEOs to indicate the percentage of each form of pay they devote to essential expenses, savings and nonessential expenses (see Figure 1 for average percentage of pay devoted to essential expenses). We then multiplied the percentage allocated to essential expenses against the downside risk score and summed these products across the five types of pay to produce a downside risk to essential pay index. The higher the value of this index, the greater the risk to pay that is largely devoted to essential expenses. Mathematically, the formula appears:

$$\text{Downside risk of essential pay}_i = \sum_{k=1}^5 (\text{Allocation to essential}_{ik} * \text{Downside risk of pay}_{ik})$$

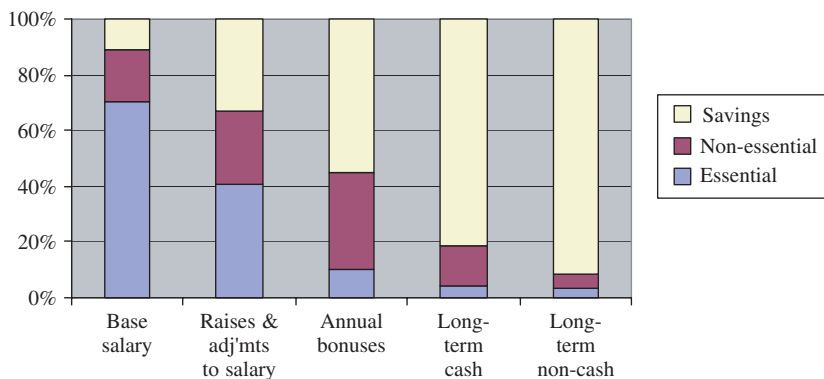


Figure 1. Allocation of pay

Variability of pay

Our measure of variability of pay is calculated similarly to the downside risk measure. First, we asked CEOs to indicate ‘the extent to which this pay item has varied over the years since the IPO.’ Responses were made on a six-point scale (1 = does not vary from year to year; 6 = is extremely variable over time; almost unpredictable). Just as in the case of downside risk, the split-sample analysis shows that the mean differences for the variability of the five compensation elements are not statistically significant between the two randomly chosen samples of 54 each. The correlation between the two sets of means across the two samples reached 0.99 ($p \leq 0.001$). Within each sample, all of the mean pair comparisons reached statistical significance, indicating high discriminant validity. Table 1 shows the descriptive statistics and correlations for downside risk and variability attributed by respondents to each component of compensation using the scale described above. Differences in the mean values and inter-item correlations indicate that respondents saw these items differently and did not equate downside risk with variability in assessing each type of compensation.

The variability scores (for salary, annual bonuses, and so forth) were then weighted by allocation percentages and summed across k forms of pay to create an index of variability of essential pay. That is, we multiplied the allocation percentage (for essential expenses) by the variability score for each type of pay and summed these products to produce a variability of essential pay index. A high score on this measure corresponds to high variability in those elements of compensation that are largely devoted to essential expenses. Mathematically, the formula appears:

$$\text{Variability of essential pay}_i = \frac{\sum_{k=1}^5 (\text{Allocation to essential}_{ik} * \text{Variability of pay}_{ik})}{\text{Variability of essential pay}_i}$$

Perceived employment risk

We measure CEO employment risk using a survey item which asked CEOs about threats to their employment in recent years. Specifically, CEOs indicated their agreement on a seven-point scale (1 = strongly disagree to 7 = strongly agree) to

the following statement: ‘There were years when I believed my employment security was at risk.’ These answers were eventually recoded into a dummy variable, where one indicates CEOs who responded with ‘strongly agree’ to the statement, and zero represents those who selected answers 1 through 6 on this scale. Our concentration on the extreme case (those that chose ‘strongly agree’) was to ensure that we had captured those for whom termination was most likely. As March and Shapira (1992) argue, and empirically demonstrated by Gomez-Mejia *et al.* (2007), decision-makers are most likely to shift their attention away from success and toward the potential for failure when their resource positions begin to move close to failure.

For CEOs, the probability of termination is firm specific and depends on a variety of factors, including firm performance, board independence, and so forth. Since the person most likely to have this knowledge is the CEO, we surveyed the CEOs themselves. In support of the external validation of this measure we found that responses to this item were positively correlated ($r = 0.282$; p -value = 0.004) with prior voluntary and involuntary CEO departures within the firm (Coughlan and Schmidt, 1985), with responses to a performance target attainment question ($r = 0.325$; $p = 0.001$) that asked CEOs to indicate the degree to which he/she has failed to satisfy performance targets contained within the compensation agreement, and negatively with objective firm performance as measured by average ROA ($r = -0.490$; p -value = 0.000).

Options value

We measured the value of stock options held by CEOs by taking the average value of options held as reported in the firm’s proxy statement over 3 years (1995–97). 1995 was chosen as the first year in the period since all IPOs occurred prior to 1996. This captures the earliest year where a majority of firms will have reported data. For firms with less than 3 years of data, the average was based on available data. Hence, some values are based on 1 and 2 years of data. We calculated the value of stock options by multiplying the number of stock options held against the difference between stock price and exercise price of options at year-end. This calculation correlates with values derived from the Black–Scholes method (Black

Table 1. Means and Pearson's correlations of compensation components' downside risk and variability

ID	Variable name	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1	Long-term non-cash compensation: downside risk	4.62	1.86	1.000									
2	Long-term cash compensation: downside risk	3.06	2.14	0.468**	1.000								
3	Annual bonuses: downside risk	4.62	1.48	0.468**	0.434**	1.000							
4	Raises and adjustments to base salary: downside risk	3.03	1.56	0.261*	0.326*	0.468**	1.000						
5	Annual base salary: downside risk	1.79	1.15	0.058	-0.013	0.059	0.326**	1.000					
6	Long-term non-cash compensation: variability	4.11	1.79	0.589**	0.315*	0.088	0.159	0.117	1.000				
7	Long-term cash compensation: variability	2.54	1.95	0.167	0.632**	0.083	0.121	0.072	0.396**	1.000			
8	Annual bonuses: variability	4.13	1.32	0.336**	0.241	0.610**	0.273*	0.133	0.212*	0.307*	1.000		
9	Raises and adjustments to base salary: variability	2.89	1.24	0.084	0.117	0.100	0.529**	0.181	0.163	0.168	0.180	1.000	
10	Annual base salary: variability	1.91	0.90	-0.233*	-0.175	-0.081	0.095	0.106	-0.251*	-0.156	-0.130	0.193	1.000

* $p < 0.05$; ** $p < 0.01$

and Scholes, 1973) at 0.921 ($p < 0.001$) and with values obtained by valuing stock options at 25 percent of their exercise price (Lambert, Larcker, and Weigelt, 1993) at 0.943 ($p < 0.001$).

Control variables

We controlled for CEO age, pay mix, firm size, and firm performance in this study. A study by MacCrimmon and Wehrung (1990) revealed that the only stable personal characteristic of CEOs having a significant influence over risk preference was age. Thus, we included *CEO age*, as reported in the firm's 1997 proxy statement. *Pay mix* was measured by calculating the average proportion of variable pay (i.e., short-term bonuses, restricted stock awards, stock options, and long-term income pay-outs) over total pay received by the CEO during the period 1993–97 (Gomez-Mejia and Balkin, 1992). Only compensation received by the CEO while holding the CEO position was included in this calculation. Partial year compensation was also excluded. On average, 35 percent of total compensation is variable in nature, the same percentage reported by Murphy (1999) for a large sample of CEOs during a similar time period. *Firm size* was measured using the log of average total assets held by the firm during the 1992–97 period. *Firm performance* is measured using average ROA for the 1992–97 period.

RESULTS

As displayed in Figure 1, a larger proportion of fixed pay (pay with lower variability) is devoted to essential expenses than high-variability pay (e.g., long-term, non-cash compensation options). This finding is consistent with the logic of BAM that less variable forms of pay are primarily used to support one's standard of living (defined as essential expenses), while more variable forms of pay are not. Table 2 displays the descriptive statistics and correlation matrix for all variables used in the study. As might be expected, we find reasonably strong correlations between the two aspects of compensation risk: Downside risk of essential pay is correlated with the variability of essential pay ($r = 0.687$; $p < 0.001$). Given the strong correlations between the variability in essential pay and downside risk to essential pay we performed a confirmatory factor analysis to see if these two

variables loaded on a single factor. The variables loaded poorly on the same factor (less than 0.7), supporting the discriminant validity between these indicators.

Common method bias is a potential problem in this sample since the major source of our data comes from a single survey. To test for this possibility, we first looked for common variance among the survey items by examining the average correlation between all the survey items. Average correlation is 0.025 (0.047 if only survey items directly related with IV and DV are considered). Those correlations that are statistically different from zero (11% of total correlations) are all consistent with *ex ante* expectations. Second, as reported previously, inter-rater agreement between two random subsamples on the riskiness of the nine items was 0.91. This result indicates considerable agreement among independent raters on what is risky. If common method bias was present, we would expect lower agreement among independent respondents and a much higher level of inter-item correlation for individual raters. In other words, common method variance should be evidenced by a higher Cronbach's alpha and a lower inter-rater reliability for the risk-taking items, yet we found just the opposite. Finally, we conducted a confirmatory factor analysis of the survey measures to see if they loaded on a single factor or multiple factors. The five-factor model produced a better global fit on all fit indices than the single-factor model (see Table 3), suggesting that common method bias is unlikely to create spurious results.

Test of hypotheses

Table 4 provides results from our test of hypotheses. Consistent with Hypothesis 1, variability of essential pay ($t = 4.228$) exhibits a significant positive association with risk taking. As the variability of essential pay declines, implying an increase in the reliability or probability of this pay, strategic risk taking decreases. Thus, Hypothesis 1 is supported. Hypothesis 2 predicts a negative association between downside risk of essential pay and risk taking. Consistent with Hypothesis 2, downside pay risk exhibits a significant negative relation to risk taking ($t = -2.888$). Perceived risk of losing anticipated essential forms of pay corresponds to lower strategic risk taking. Thus Hypothesis 2 is supported. In order to test the robustness of these

Table 2. Mean, standard deviation, and Pearson's correlations

ID	Variable name	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1	Risk-taking composite	16.387	4.810	1.000									
2	Variability of essential compensation	2.771	2.438	0.187	1.000								
3	Downside risk to essential compensation	2.604	2.275	0.011	0.687**	1.000							
4	Employment risk	3.606	2.143	0.221*	0.076	0.098	1.000						
5	Employment risk (dummy)	0.134	0.343	0.227*	0.005	0.097	0.628**	1.000					
6	Stock option value (millions \$)	1.728	4.734	-0.202*	0.211*	0.047	-0.174	-0.088	1.000				
7	CEO age	49.890	8.925	-0.261*	0.211*	0.068	-0.095	-0.033	0.068	1.000			
8	Pay mix	0.366	0.250	0.019	0.072	0.140	-0.200	-0.049	0.390**	-0.052	1.000		
9	Firm size	3.711	1.513	-0.075	-0.099	-0.165	-0.381**	-0.275**	0.242*	0.032	0.426**	1.000	
10	Average ROA	-1.187	3.404	-0.096	-0.001	-0.086	-0.490**	-0.414**	0.198*	0.062	0.189	0.544**	1.000

* $p < 0.05$; ** $p < 0.01$

Table 3. Global model fit indexes

Model	χ^2	d.f.	$\chi^2/d.f.$	Prob.(χ^2)	RMSEA	GFI	CFI	IFI	Change in χ^2	Change in d.f.	Probability ^a
Single-factor model	98.097	12	8.174	<0.001	0.259	0.805	0.471	0.481			
Five-factor model	7.752	3	2.584	<0.051	0.122	0.977	0.971	0.973	90.345	9	<0.001

^a Probability of observing a change in χ^2 greater than the reported 'change in χ^2 ', for a variable that follows a χ^2 distribution with 'difference in d.f.' degrees of freedom. Probabilities are stated in inequality terms as χ^2 tables are sparse.

Table 4. Influence of agent risk on risk taking (standardized coefficients with *t*-tests in parentheses)

Independent variable	Model 1	Model 2
CEO age	-0.254(-2.413)*	-0.317(-3.300)***
Pay mix (variable/total pay)	0.039 (0.339)	0.154 (1.352)
Firm size (log assets)	-0.059(-0.383)	-0.011(-0.088)
Firm performance (ROA)	-0.059(-0.471)	0.033 (0.278)
Variability of essential pay		0.577 (4.228)***
Downside risk of essential pay		-0.390(-2.888)**
Employment risk		0.241 (2.346)*
Value of stock options		-0.326(-3.074)**
Adjusted R^2	0.033	0.239***
Change in adjusted R^2		0.206***
<i>N</i>	108	108

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

findings, we also tested a model that included measures of the downside risk and pay variability of both nonessential pay and savings pay. None of these variables exhibited a significant association with risk taking. Thus, only the variability and downside risk exposure of essential pay influenced risk propensity. Further, adding industry controls does not alter the results reported in the paper. None of the industry controls showed significant coefficients.

Hypothesis 3 predicted that employment risk would be positively associated with risk taking. Our results support Hypothesis 3: employment risk exhibited a positive association with risk taking ($t = 2.346$). Consistent with Hypothesis 4 the value of unexercised stock options exhibits a significant negative association with risk taking (t -value = -3.074). The higher the value of unexercised stock options, the less risk taking CEOs exhibit. Thus Hypothesis 4 is supported.

Among the control variables, CEO age exhibited a significant negative influence on CEO risk taking, a finding consistent with MacCrimmon and Wehrung (1990). Neither firm performance nor

firm size exhibited a significant influence. Finally, pay mix (the proportion of contingent pay in the total compensation package) failed to exhibit a significant association with risk taking.⁴

DISCUSSION

This study provides empirical support for the core ideas contained in BAM (Wiseman and Gomez-Mejia, 1998). Specifically, it supports the negative association between stock options and risk taking, the disaggregation of downside compensation risk from variability, the importance of distinguishing between employment risk and compensation risk, and the lack of fungibility across different forms of compensation. Overall our results are consistent with the idea that decision-makers, CEOs in this case, are loss averse, and thus seek to protect personal wealth from potential losses (Kahneman

⁴ Tests for multicollinearity indicated that collinearity was not influencing results. Specifically, the highest variance inflation factor (VIF) found was 2.1 and the highest condition index (CI) found was 20.

and Tversky, 1979; Tversky and Kahneman, 1986; Wiseman and Gomez-Mejia, 1998) but may also take greater risks when faced with loss. This implies that CEO risk preferences may be non-static and that models which assume consistent risk preferences, particularly risk aversion, appear to lack predictive accuracy. Finally, our model approached the measurement of risk taking from the perspective of the risk-taker by including their assessment of the risk produced from each action taken. Further, by creating a composite measure of firm risk, we recognize that a firm's strategic risk profile results from multiple independent actions that when combined can accentuate or moderate overall risk exposure (see Wiseman and Catanach, 1997).

Implications

Several behavioral implications emerge from this study. Primary among them is the role of CEOs' loss aversion regarding their standard of living in determining their firms' risk posture. In particular, our results suggest that protection by the CEO of those portions of compensation largely devoted to essential expenses (and thus assumed critical to one's standard of living), and which are viewed as stable over time, may play a fundamental role in determining the firm's risk posture. Further, contrary to normative agency-based arguments (e.g., Holmstrom and Milgrom, 1987), variability of compensation does not deter risk taking but appears to enhance risk taking. Collectively, these findings support the BAM view of executive compensation, and thereby challenge traditional models that rest on assumptions of uniform risk aversion.

Among the more interesting findings of our study is that the value of CEO stock options is negatively associated with risk taking. Traditional views of compensation design tend to hold that stock options promote alignment between the interests of agents and those of principals. For example, Lewellen, Loderer, and Rosenfelt (1985) observed that as the amount of CEOs' ownership in their firm increased, they were less likely to make merger bids that would lower their stock prices. This association was interpreted as supporting the notion that stock-based compensation (e.g., stock options) effectively aligns CEO and shareholders' interests. However, it is a long leap from observing wealth preservation

to attributing intentions of wealth maximization. Furthermore, Lambert, Lanen, and Larcker (1989), Lavelle *et al.* (2002, 2003), or Decarlo (2003) report evidence that, at least, asks for a deeper thought on the long-cited capacity of stock-based compensation to align CEO and shareholders' interests. Specifically, Lambert *et al.* (1989) empirically demonstrated that the adoption of stock option plans reduced corporate dividends. Given the negative effect that granting dividends has on stock price, this evidence supports the hypothesis of wealth protection. In addition, others (Healy, 1985; Holthausen, Larcker, and Sloan, 1995) have observed similar responses to other types of contingent compensation (e.g., annual bonuses). Also in a study of the ownership and performance consequences of the exercise of CEO stock options, McGuire and Matta (2003) put into question the incentive alignment properties of stock options. All these results are consistent with Wiseman and Gomez-Mejia's (1998) idea that CEOs seek to protect current wealth, even if this means forfeiting potentially higher income.

The positive association between pay variability and risk taking provides additional evidence of loss aversion. Specifically, as the variability of essential pay declines, presumably CEOs sense less uncertainty about its future award and will seek ways to protect this anticipated pay by lowering the level of risk they accept in making strategic choices. Conversely, when essential pay is highly variable, executives may perceive less risk to wealth (less risk bearing) since they see this pay as less likely to be awarded. This finding refines BAM's predictions regarding endowment of essential pay by suggesting that CEOs may be less likely to endow future pay into calculations of personal wealth when they see the award of that pay as less certain. This finding corresponds to prospect theory predictions that, as the probability of a future gain increases, decision-makers generally become risk averse in order to protect these anticipated additions to wealth.

By contrast, we find a negative association between downside risk to essential pay and risk taking. Though pay variability may represent the certainty or reliability of future essential pay, downside risk represents only the potential for losing some portion of future pay that is already viewed as reliable. As threats to anticipated essential pay emerge, CEOs appear to lower the risk

profile of the firm in order to reduce the risk of losing some portion of anticipated pay. These actions may reflect an attempt to counterbalance environmental factors that threaten the award of future pay (see Palmer and Wiseman, 1999), or an attempt to avoid mistakes that could exacerbate the potential loss of anticipated income (March and Shapira, 1992).

Possibly even more important than the difference between downside risk and variability is the difference between pay used for different purposes. It is traditional in economic models of compensation to assume pay is fungible in all its forms regardless of type, risk, or source. That is, compensation recipients make no distinctions between the sources of pay and may use them indiscriminately in satisfying their primary needs. Our research suggests a very different picture of how different forms of pay are perceived, used, and thus treated. In particular, we find that stable forms of pay are primarily used for maintaining one's standard of living, while less reliable forms of pay are largely devoted to nonessential expenses and savings. Differences in allocation appeared to have implications for risk taking, which suggests that CEOs may have differential concerns for these different forms of pay. That is, CEOs appear to be more concerned about protecting those forms of pay that are critical to maintaining their standard of living than they are about pay devoted to savings or nonessential expenses. Said another way, it would appear that pay devoted to essential expenses (specifically stable forms of pay) may play a more important role in determining executive risk bearing than the less stable forms of pay which are largely allocated to nonessential use. This is exactly the opposite of what most compensation scholars have predicted about the role of compensation design and risk bearing (see Gomez-Mejia and Wiseman, 1997, for a review).

This conclusion is further echoed when we compare the results associated with pay mix and those of the downside risk measures. Traditionally, compensation risk has been captured through measures of pay mix that categorize different types of pay into fixed and variable forms based on broad definitions of each type of pay. Although some scholars have criticized this arbitrary classification of pay as contrived (Tosi and Gomez-Mejia, 1989), we go further and suggest that any definition of compensation risk that exclusively focuses on pay

mix lacks external validity. As our results indicate, real pay risk is the threat of loss, not just uncertainty. Said another way, measures of downside risk of those forms of pay critical to one's standard of living may be more efficient at capturing the theoretical construct of compensation risk, a suggestion made years ago by Tosi and Gomez-Mejia (1989). Alternatively, this finding could also be interpreted as support for the idea that the whole compensation package, and not just the incentive portion, should be considered when examining how compensation affects CEO behavior (Bloom and Milkovich, 1998).

In addition, we observe a positive association between employment risk and risk taking. This relation indicates that CEOs who perceived a greater likelihood of termination were more likely to engage in greater risk taking than CEOs who perceived a lower chance of termination. This result coincides with BAM's prediction, where employment risk represents a threat to all current and future income (Amihud and Lev, 1981; Agrawal and Mandelker, 1987). This result conforms to research by Miller and Chen, who find that 'organizations performing poorly showed increased risk as they neared bankruptcy' (Miller and Chen, 2004: 105).

One explanation for our results is that we focused on categorizing respondents as facing termination only if they indicated that the perceived threat to employment was 'strong.' Therefore, as a final test, we substituted a continuous variable for the dummy code to capture CEO employment risk. This continuous variable uses a seven-point scale ('strongly agree' to 'strongly disagree') and asks respondents to indicate the degree to which they agree with the statement that they believe their continued employment was threatened. Although this variable again exhibits a positive association, its influence on risk-taking behavior was not significant. This finding suggests that the marginal influence of employment risk on risk behavior increases as employment risk rises. This finding supports the BAM view that agents are likely to pursue risk when they anticipate losses in perceived wealth. Given that employment represents all future income potential, perceived threats to employment are likely to prompt significant changes in behavior. The only remaining question is whether this increase in risk taking corresponds to improved performance, as assumed by some compensation scholars, or results in deteriorating

performance as suggested by Wiseman and Bromiley (1996).

Finally, we developed a composite measure of firm risk that recognizes the idiosyncratic nature of strategic risk as well as the role of risk perception in pursuing or avoiding risky actions. Incorporating risk perception is critical to distinguishing between intentional and unintentional risk-taking behavior, and corresponds to findings by Webber and Milliman (1997), who find that controlling for risk perception can eliminate the framing effect on risk preference reversal. In contrast, our results continue to find evidence of risk preference reversals between differently framed conditions. Also, by combining a variety of strategic actions, our composite measure provides a superior measure of a firm's strategic risk profile in that it allows for strategic flexibility across firms and encompasses a variety of strategic postures. Specifically, it avoids focusing on a single strategic dimension that may be constrained not by choice but by exogenous factors that limit executive discretion (e.g., Hambrick and Finkelstein, 1987). In sum, this measure recognizes the idiosyncratic multidimensional nature of a firm's strategic risk profile, while formally incorporating individual perceptions of the risks associated with those dimensions.

Limitations

Field research involving surveys of CEOs often faces several issues that potentially could threaten the reliability and validity of the study, including response rates and common method bias. Although our study faced similar problems, as noted below, several procedures were enacted to determine whether these issues biased our results. First, our response rate was relatively low. As described in the Methods section, however, we performed numerous tests and none of them revealed evidence of sample response bias. Despite this lack of evidence, we must urge caution in drawing conclusions from a small sample, and suggest that future research consider ways of attracting higher response rates from the population of interest, namely CEOs.

Another potential problem is the use of a single survey to capture many of the constructs of interest, often referred to as common method bias. When present, this bias creates a common or shared variance among items on the survey that can result in spurious associations. We conducted

several tests to check for this possibility and none of them indicated the presence of common method variance. Again, we believe that, although we rely on a single instrument for much of our data, we find little evidence to suggest it is a problem here. However, we must again urge caution and suggest that future research seek to replicate our findings using multiple methods for gathering such data.

Also, it is worth noting that people may present a limited capacity to remember past events, which could affect their perceptions and become a potential biasing source. Although a thorough test of the capacity of the CEOs in our sample to recall past events is not possible with the data at hand, we do not believe it systematically biases our results. Firstly, we are not asking CEOs to report about events that occurred many years ago but about concrete things in the very recent past (e.g., pay variability during the past 4 years). Besides, for this issue to become a confounding factor in the testing of the hypothesis, memory would have to be biased in a particular way. We can not think of any such biases in favor of the hypotheses so, if anything, memory lapses would tend to attenuate the strength of the observed empirical relationships. We should also point out that whenever possible we correlated the CEO's response to archival data (e.g., employment risk and ROA) and there was convergence in the information sources.

Finally, the context of any field study can also reflect an important exogenous influence that can systematically bias findings. For example, the timing of the study may have influenced the perception of compensation risk. The data for this study were collected in 1998, which is toward the end of the longest period of economic growth in U.S. history. It may be that the 'market exuberance' of that period influenced perceptions of compensation and specifically stock option value. Although this is certainly possible, several studies done after the market decline of 2000–01 find that an optimism bias regarding the valuation of stock options continues to exist (Larcker and Lambert, 2001; Devers, Wiseman, and Holmes, 2007). Clearly, research that focuses on any economic period must consider the potential bias this creates. However, given the apparent durability of optimism regarding the value of stock options, even in a recessionary climate, we continue to believe that our findings are robust across different economic contexts.

CONCLUSIONS

The present study extends the research on the risk-taking consequences of compensation design in the context of the CEO–shareholders agency relationship initiated by the work of Wiseman and Gomez-Mejia (1998). In particular, it suggests a disaggregation of risk bearing into three different forms: employment risk; downside compensation risk; and pay variability. Although our results provide empirical validation of the core ideas expressed within BAM, this study goes further in finding that risk bearing is multidimensional, and that CEOs respond differently to each dimension of risk created within the principal–agent contract. In addition, our results suggest that capturing risk preferences using firm-level proxies requires that we consider these proxies from the perspective of actor before assigning risk attributions to these proxies. Although more research is needed, it gives another step towards the development of more ‘realistic’ models of CEO compensation and behavior. Some of the empirical results advanced here suggest interesting directions that future research in executive compensation and corporate governance should explore.

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REFERENCES

- Agrawal A, Mandelker GN. 1987. Managerial incentives and corporate investment and financing decisions. *Journal of Finance* **42**: 823–837.
- Amihud Y, Lev B. 1981. Risk reduction as a managerial motive for conglomerate mergers. *Bell Journal of Economics* **12**: 605–617.
- Armstrong JS, Overton TS. 1977. Estimating nonresponse bias in mail surveys. *Journal of Marketing Research* **14**(3): 396–402.
- Beatty RP, Zajac EJ. 1994. Managerial incentives, monitoring, and risk of executive compensation, ownership, and board structure in initial public offerings. *Administrative Science Quarterly* **39**: 313–335.
- Berger PG, Ofek E, Yermack DL. 1997. Managerial entrenchment and capital structure decisions. *Journal of Finance* **52**: 1411–1438.
- Black F, Scholes M. 1973. Pricing of options and corporate liabilities. *Journal of Political Economy* **81**: 637–654.
- Bloom M, Milkovich GT. 1998. Relationships among risk, incentive pay, and organizational performance. *Academy of Management Journal* **41**: 283–297.
- Boyd BK, Gove S, Hitt MA. 2005. Construct measurement in strategic management research: illusion or reality? *Strategic Management Journal* **26**(3): 239–257.
- Chen D. 1998. Functional relations among constructs in the same content domain at different levels of analysis: a typology of composition models. *Journal of Experimental Social Psychology* **13**: 315–332.
- Coughlan AT, Schmidt RM. 1985. Executive compensation, management turnover, and firm performance: an empirical investigation. *Journal of Accounting and Economics* **7**: 43–66.
- Decarlo S. 2003. The best & worst bosses. *Forbes* **171**: (12 May): 100–101.
- DeFusco RA, Johnson RR, Zorn TS. 1990. The effect of executive stock option plans on stockholders and bondholders. *Journal of Finance* **45**: 617–627.
- DeFusco RA, Zorn TS, Johnson RR. 1991. The association between executive stock option plan changes and managerial decision making. *Financial Management* Spring: 36–43.
- Devers CE, Wiseman RM, Holmes RM. 2007. The effects of endowment and loss aversion in managerial stock option valuation. *Academy of Management Journal* **50**(1): (forthcoming).
- Doz YL, Olk PM, Ring PS. 2000. Formation processes of R&D consortia: which path to take? Where does it lead? *Strategic Management Journal*, Special Issue **21**(3): 239–266.
- Eckbo BE, Thorburn KS. 2003. Control benefits and CEO discipline in automatic bankruptcy auctions. *Journal of Financial Economics* **69**: 227–258.
- Fama EF. 1980. Agency problems and the theory of the firm. *Journal of Political Economy* **88**: 288–397.
- Fama EF, Jensen MC. 1983. Agency problems and residual claims. *Journal of Law and Economics* **26**: 327–349.
- Finkelstein S, Hambrick DC. 1990. Top-management-team tenure and organizational outcomes: the moderation role of managerial discretion. *Administrative Science Quarterly* **35**: 484–503.
- Forsythe JB. 1977. Obtaining cooperation in a survey of business executives. *Journal of Marketing Research* **14**: 370–373.
- Fowler FJ. 1993. *Survey Research Methods*. Sage: Newbury Park, CA.
- Gomez-Mejia LR. 1992. Structure and process of diversification, compensation strategy, and firm performance. *Strategic Management Journal* **13**(5): 381–397.

- Gomez-Mejia LR. 1994. Executive compensation: a reassessment and a future research agenda. In *Research in Personnel and Human Resources Management*, Vol. 12, Ferris G (ed). JAI Press: Greenwich, CT; 161–222.
- Gomez-Mejia LR, Balkin DB. 1992. *Compensation, Organizational Strategy and Firm Performance*. Southwestern: Cincinnati, OH.
- Gomez-Mejia LR, Wiseman RM. 1997. Reframing executive compensation: an assessment and outlook. *Journal of Management* **23**: 291–374.
- Gomez-Mejia LR, Takacs K, Jacobson K, Nunez-Nickel M, Moyano J. 2007. Family firms: risk willing or risk averse. *Administrative Science Quarterly* (forthcoming).
- Gupta AK, Govindarajan V. 1984. Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. *Academy of Management Journal* **27**: 25–41.
- Hall BJ. 2000. What you need to know about stock options. *Harvard Business Review* **78**(2): 121–129.
- Hall BJ, Murphy KJ. 2002. Stock options for undiversified executives. *Journal of Accounting and Economics* **33**: 3–42.
- Hambrick DC, Finkelstein S. 1987. Managerial discretion: a bridge between polar views of organizational outcomes. In *Research in Organizational Behavior*, Vol. 9, Cummings LL, Staw BM (eds). JAI Press: Greenwich, CT; 369–406.
- Haugen RA, Senbet LW. 1981. Resolving the agency problems of external capital through options. *Journal of Finance* **36**: 629–647.
- Healy PM. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* **7**: 85–107.
- Holmstrom B, Milgrom P. 1987. Aggregation and linearity in the provision of intertemporal incentives. *Econometrica* **55**: 303–328.
- Holthausen RW, Larcker DF, Sloan RG. 1995. Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* **19**: 29–74.
- Hoskisson RE, Hitt MA, Hill CWL. 1992. Managerial incentives and investment in R&D in large multi-product firms. *Organization Science* **3**: 1–17.
- Jarvis CB, MacKenzie SB, Podsakoff PM. 2003. A critical review of construct indicators and measurement misspecification in marketing and consumer research. *Journal of Consumer Research* **30**: 199–218.
- Jensen MC, Murphy KJ. 1990. Performance and top management incentives. *Journal of Political Economy* **98**(2): 225–264.
- Kahneman D, Tversky A. 1979. Prospect theory: an analysis of decisions under risk. *Econometrica* **47**: 263–291.
- Khandwalla PN. 1977. *The Design of Organizations*. Harcourt Brace Jovanovich: New York.
- Kühberger A. 1998. The influence of framing on risky decisions: a meta analysis. *Organizational Behavior and Human Decision Processes* **75**: 23–55.
- Lambert RA, Lanen WN, Larcker DF. 1989. Executive stock option plans and corporate dividend policy. *Journal of Financial and Quantitative Analysis* **24**: 409–425.
- Lambert RA, Larcker DF, Verrecchia RE. 1991. Portfolio considerations in valuing executive compensation. *Journal of Accounting Research* **29**(1): 129–149.
- Lambert RA, Larcker DF, Weigelt K. 1993. The structure of organizational incentives. *Administrative Science Quarterly* **38**: 438–461.
- Larcker DF, Lambert RL. 2001. How employees value (often incorrectly) their stock options. Knowledge@Wharton. <http://knowledge.wharton.upenn.edu> [6 February 2007].
- Lavelle L, Jespersen FF, Arndt M. 2002. Executive pay. *Business Week* **3778**(15 April): 80–86.
- Lavelle L, Jespersen FF, Ante S, Kerstetter J. 2003. Executive pay. *Business Week* **3829**(21 April): 86–90.
- Law K, Wong CS. 1999. Multidimensional constructs in structural equation analysis: an illustration using the job perception and job satisfaction constructs. *Journal of Management* **25**: 143–160.
- Lewellen WG, Loderer C, Rosenfelt A. 1985. Merger decisions and executive stock ownership in acquiring firms. *Journal of Accounting of Economics* **7**: 209–232.
- MacCrimmon KR, Martens ML. 1999. Predicting post-IPO performance from ex-ante risk measures. Working paper, University of British Columbia.
- MacCrimmon KR, Wehrung DA. 1990. Characteristics of risk taking executives. *Management Science* **36**: 422–435.
- March JG, Shapira Z. 1992. Variable risk preferences and the focus of attention. *Psychological Review* **99**: 172–183.
- Matsuda S, Vanderwerf P, Scarbrough P. 1994. A comparison of Japanese and U.S. firms completing initial public offerings. *Journal of Business Venturing* **9**: 205–222.
- McGuire J, Matta E. 2003. CEO stock options: the silent dimension of ownership. *Academy of Management Journal* **46**: 255–265.
- Mehran H, Nogler GE, Schwartz KB. 1998. CEO incentive plans and corporate liquidation policy. *Journal of Financial Economics* **50**: 319–349.
- Miller KD, Chen WR. 2004. Variable organizational risk preferences: tests of the March–Shapira model. *Academy of Management Journal* **47**: 105–115.
- Miller KD, Leiblein MJ. 1996. Corporate risk–return relations: returns variability versus downside risk. *Academy of Management Journal* **39**: 91–122.
- Mooney CZ, Duval RD. 1993. *Bootstrapping: A Non-parametric Approach to Statistical Inference*. Sage: Thousand Oaks, CA.
- Murphy D. 1999. Executive compensation. In *Handbook of Labor Economics*, Vol. 3b, Ashenfelter O, Card D (eds). Elsevier/North-Holland: Amsterdam; 2485–2563.
- Palmer TB, Wiseman RM. 1999. Decoupling risk taking from income stream uncertainty: a holistic model of risk. *Strategic Management Journal* **20**(11): 1037–1062.
- Prasso S, Lavelle L. 2003. CEO pay: pain, but plenty of gain. *Business Week* **3821**(24 February): 16.

- Rajgopal S, Shevlin T. 2002. Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting of Economics* **33**: 145–171.
- Reingold J. 2000. Executive pay. *Business Week* 17 April: 100–102.
- Sanders WG. 2001. Behavioral responses of CEOs to stock ownership and stock option pay. *Academy of Management Journal* **44**: 477–492.
- Shapira Z. 1995. *Risk Taking: A Managerial Perspective*. Russell Sage Foundation: New York.
- Siegel S, Castellan JN Jr. 1988. *Non-parametric Statistics for the Behavioral Sciences*. McGraw-Hill: New York.
- Singh JV. 1986. Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal* **29**: 562–585.
- Sitkin SB, Pablo AL. 1992. Reconceptualizing the determinants of risk behavior. *Academy of Management Review* **17**(1): 9–39.
- Stoner JA. 1968. Risky and cautious shifts in group decisions: the influence of widely held values. *Journal of Experimental Social Psychology* **4**: 442–459.
- Strahilevitz MA. 1992. Applications of prospect theory to the design of sales force compensation plans. Working paper, Center for Research in Management, University of California, Berkeley.
- Subramani MR, Venkatraman N. 2003. Safeguarding investments in asymmetric interorganizational relationships: theory and evidence. *Academy of Management Journal* **46**(1): 46–62.
- Thaler RH, Johnson EJ. 1990. Gambling with the house money and trying to break even: the effects of prior outcomes on risky choice. *Management Science* **36**: 643–660.
- Tosi HL, Gomez-Mejia LR. 1989. The decoupling of CEO pay and performance: an agency theory perspective. *Administrative Science Quarterly* **34**: 169–189.
- Tversky A, Kahneman D. 1986. Rational choice and the framing of decisions. *Journal of Business* **59**(4): S251–S278.
- Tversky A, Kahneman D. 1992. Advances in prospect theory: cumulative representation of uncertainty. *Journal of Risk and Uncertainty* **5**: 297–323.
- Tversky A, Wakker P. 1995. Risk attitudes and decision weights. *Econometrica* **63**: 1255–1280.
- Tversky A, Slovic P, Kahneman D. 1990. The causes of preference reversal. *American Economic Review* **80**: 204–217.
- Van de Ven A, Ferry D. 1979. *Measuring and Assessing Organizations*. Wiley: New York.
- Wakker PP. 2003. The data of Levy and Levy (2002) ‘Prospect theory: much ado about nothing?’ actually support prospect theory. *Management Science* **49**: 979–981.
- Webber E, Milliman R. 1997. Perceived risk attitudes: relating risk perception to risky choice. *Management Science* **43**(1): 123–144.
- Welbourne TM, Wright PM. 1997. Which resources matter in initial public offering firms? A longitudinal comparison of five resources’ contributions to firm performance. Working paper #97 – 02, Center for Advanced Human Resource Studies, Cornell University.
- Wiseman RM, Bromiley P. 1996. Toward a model of risk in declining organizations: an empirical examination of risk, performance and decline. *Organization Science* **7**(5): 524–543.
- Wiseman RM, Catanach AH Jr. 1997. A longitudinal disaggregation of operational risk under changing regulatory conditions: evidence from savings and loan industry. *Academy of Management Journal* **49**(4): 799–830.
- Wiseman RM, Gomez-Mejia LR. 1998. A behavioral agency model of managerial risk-taking. *Academy of Management Review* **23**: 133–153.