COMPENSATION FRAMING AND THE RISK TAKING BEHAVIOR OF THE CEO: TESTING THE INFLUENCE OF ALTERNATIVE REFERENCE POINTS

[Short Title: Compensation Framing and CEO Risk Taking Behavior]

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Abstract

Purpose: The article seeks to analyze how compensation framing influences the risk-taking behavior of the firm's Chief Executive Officer (CEO), and mediating role played by risk bearing.

Design/methodology/approach: The study employs a sample of 108 USA firms that issued an Initial Public Offering in 1993, 1994 and 1995. Data from a survey filled out by the CEO of the firm is completed with secondary information. A Structural Equation Model is estimated which explicitly considers the mediating effect of risk bearing on the compensation framing – risk taking relationship.

Findings: The analyses indicate that while the performance targets included in the CEO's compensation contract indirectly influence the riskiness of the CEO's strategic decisions through its influence on the employment risk component of executive risk bearing, the level of compensation relative to peers doesn't. It shows that not all reference points are equally relevant in determining the CEO's willingness to take risk, nor do all the elements of risk bearing play the same role in that partial mediation.

Research implications: The article provides a refinement of previous work on modelling the risk taking behavior of managers.

Practical implications: Provides a guideline to think about the behavioural consequences of the pay level in the market for executives and the performance targets included in the compensation contracts.

Originality/value: It proposes and tests a model on how different reference points used to frame compensation influence CEO risk taking. It also provides the first test of a central proposition of the Behavioral Agency Model: risk bearing partially mediates the influence of compensation framing on risk taking.

Key Words: Compensation, Framing, Risk Taking

What influences managerial risk taking? *Prospect theory* (Kahneman and Tversky, 1979; Tversky and Kahneman, 1986) argues that individuals' risk taking behavior is influenced by *framing*, where framing represents the individual's perception, in terms of gains and losses, of a given situation or problem. Framing (positive or negative) is established relative to a reference point. Decision makers tend to exhibit more conservative behaviors in positively framed situations (i.e. gain contexts), while they tend to prefer riskier options in negatively framed situations (i.e. loss contexts). This reversal of risk preferences, challenges the descriptive validity of the widely used risk averse characterization of individuals, and supports instead a view that individuals are *loss averse*. Loss averse individuals seek to protect anticipated gains, and also to avoid anticipated losses -- even at the risk of larger losses (Tversky & Kahneman, 1986). In general, empirical tests, mostly conducted in laboratory settings, have supported this principle of prospect theory (Starmer, 2000).

Using some of the main ideas of prospect theory, Wiseman and Gómez-Mejía (1998) developed, in the context of the agency relationship between the CEO and the board of directors, the Behavioral Agency Model (BAM), that analyzes the influence that different mechanisms for corporate control exerts on risk taking. By doing so they extended the idea of framing to the compensation arena. These authors suggest that compensation could play a role in defining decision contexts, positive or negative, that may subsequently influence risk taking. In a negatively framed situations (alternatively, loss context) CEOs would show a willingness for risky strategic options, while they would select more conservative ones in a positively framed situations (gain context).

A critical issue when talking about compensation framing is the reference point an individual uses to frame her pay. The reference point is a key construct in both prospect theory and BAM, because it determines whether a given situation is framed as a positive or negative one. Fiegembaum, Hart and Schendel (1996: 223) indicated that, "…any variable(s) that highlights a particular target or objective seems capable of establishing a reference point and, subsequently, of creating a decision frame". In similar terms Gooding, Goel and Wiseman (1996) noticed that managers may consider different reference points. According to prospect theory the reference point

is taken into account by the decision-maker during the *editing phase*. The editing phase consists of a preliminary analysis of different prospects, which often leads to a more simplified version of those prospects (Kahneman and Tversky, 1979). Therefore, it is suggested that, changes in the reference point considered by a decision-maker (e.g. the CEO) would produce a different valuation, in terms of gains and losses, of a given situation, and eventually a different risk taking behavior.

The literature devoted to the analysis of risk behavior at the individual level has given limited attention to how different reference points may influence a decision maker's risk-taking behavior . The laboratory studies building on the methodology established by Kahneman and Tvesky, generally focus on the phase following the editing phase. The participants in these laboratory studies face a set of alternatives that have been already expressed in terms of gains or losses (e.g. Hodgkinson, Bown, Maule, Glaister and Pearman, 1999). In this sense, there is no mention of a specific reference point. In general, these studies assume the decision maker's current asset position represents the critical reference point.

Some studies offering similar predictions to prospect theory have proposed alternative reference points to the analysis of the organizational risk taking (e.g. Fiegembaum and Thomas, 1988; Lee, 1997). In addition, studies testing hypotheses proposed by the *Behavioral Theory of the Firm* (BTOF) (e.g. Ketchen and Palmer, 1999), have considered other reference points (Lant, 1992; Lant & Montgomery, 1987), as the performance of rival firms or historical performance. For instance, Fiegembaum and Thomas (1988) or Fiegembaum (1990) employed the median value of the industry Return on Assets (ROA)[1]. Ketchen and Palmer (1999) analyzed a population of hospitals and used the level of occupation of direct competitors as a measure of performance for a reference point. Lee (1997) differs a little bit from this main practice, and uses the results of the firm in the past as the relevant reference point. In any case, none of these studies explores the existence, or compares the effect, of alternative reference points. In particular this issue has never been addressed neither theoretically nor empirically in the compensation arena. In this study, we

compare possible references that CEOs may use to frame their compensation to see which reference is more likely to influence their behavior.

In their seminal piece Wiseman and Gomez-Mejia (1998) further propose that effect of framing on risk taking can be both direct and indirect, through the influence of framing on executive's risk bearing. Positive framing increases risk bearing, which in turn exhibits a negative influence on risk taking. Larraza-Kintana, Wiseman, Gomez-Mejia and Welbourne (2007) expanded the BAM by drawing a distinction between the risk borne by the executive that comes from threats to future employment and the one due to threats to future compensation. They also notice that compensation risk is to a great extent linked to risk associated to compensation devoted to support essential expenses (i.e. expenses related with the individual's standard of living) differentiating between the risk behavior induced by variability of essential compensation and downside risk of essential compensation. However these authors did not consider the role compensation framing may play in shaping the executive´s risk bearing and risk taking behavior. While there is evidence in support of the behavioral implications of compensation framing (e.g. Merriman and Deckop, 2007) the partial mediation of risk bearing on the influence of compensation framing on risk taking proposed by Wiseman and Gomez-Mejia has not been tested. In sum, little is known about the risk taking consequences of how decision makers frame compensation.

Our study seeks to advance our knowledge on this matter by looking primarily at how the risk taking behavior of the CEO changes when the CEO's compensation is framed relative to two different reference points: the performance targets included in the compensation contract and that of the CEO's peer compensation. In the next section of the paper we develop specific hypotheses about the effect compensation framing relative to these two alternative reference points may have on executive risk taking behavior. CEOs who perceive firm performance above the performance targets specified in the compensation agreement or who perceive their compensation is greater than that of their peers, we predict will decrease risk taking. Conversely when chief executives perceive

[1] Gooding et al. (1996) observed that the reference point for firms was above the median value of the return of the industry. They also noticed that such reference point changed with the industry and evolved over time, being this

they are not achieving their performance targets or feel their compensation is below their peer's compensation, they will show a preference for greater risk taking. We test the accuracy of our predictions in a sample of 108 CEOs of USA firms that went public between 1993 and 1995. From an empirical point of view our study provides the first test of a central proposition of the BAM: risk bearing partially mediates the influence of compensation framing on risk taking. We also offer evidence on whether or not any reference point creates a framing situation that is meaningful enough to influence, directly or indirectly, executive risk taking. In addition our results indicate the specific components of risk bearing that may be involved in the above mentioned partial moderation. In this vein our work extends the scarce empirical evidence about the behavioral consequences of compensation framing. Also, given the prevalence of laboratory experiments in the analysis of risk taking behavior it is worth noting that our study uses primary data collected directly from acting CEOs in the context of real strategic decisions. All in all we provide a refinement of the BAM extending previous work by Wiseman and Gomez-Mejía (1998) and Larraza-Kintana et al (2007) on modeling the risk taking behavior of managers.

ALTERNATIVE REFERENCE POINTS TO FRAME COMPENSATION

Performance Targets

Behavioral decision theory posits that decisions are reference dependent such that decision makers frame problems as gain or loss around a reference point of wealth. As noticed, a gain context occurs when future prospects positively contribute to wealth, and a loss context arises when future prospects negatively affect wealth (Kahneman & Tversky, 1979). Empirical findings tend to support a reversal of risk preferences between these situations such that decision makers facing a loss context tend to exhibit risk seeking, while decision makers in a gain context tend to exhibit risk aversion (Starmer, 2000).

In this study, we adopt the BAM assumption that CEOs are "loss averse" in their preferences. Thus, contrary to risk-averse predictions of agency-based models, we predict that

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evolution different in each industry.

CEOs may accept more risk when faced with the possibility of losing wealth, but will act more conservatively when faced with situations promising increases in wealth. That is, when faced with the possibility of losing wealth they have already counted (for example base salary) executives are more likely to protect this wealth by reducing any risk to it. Conversely, when faced with the likelihood of losing wealth, they should prefer alternatives that provide some opportunity to prevent the loss, even if this means risking higher losses (Gomez-Mejia et al., 2007; Gomez-Mejia et al., 2010).

If CEOs are agents with self-interest, however, it is likely that they will pursue firm wealth maximization only to the extent that it also generates personal rewards. Thus, a more direct test of framing on CEO strategic decisions would be to examine these choices in relation to changes in CEO wealth. Strategic choices affect CEO wealth through the compensation contract. CEO compensation often includes performance targets (e.g., market share, and stock price appreciation) that if achieved, trigger bonuses and other forms of compensation (Gómez-Mejía & Balkin, 1992). Those targets are usually specific, challenging goals that may, consequently, influence manager's risk taking in strategic choices (Larrick, Heath and Wu, 2009). It is our contention that these targets are a primary reference used by CEOs in framing strategic choice situations. That is, the CEO will frame choices between strategic options (e.g., between higher and lower risk options) relative to the performance targets in their compensation contract since achieving these targets triggers the award of contingent pay. In such a case, CEOs would perceive a gain context (positive framing) when compensation targets are being achieved, and would perceive a loss context (negative framing) if targets were not being met. Consistent with previous behavioral research we expect more risk taking from those CEOs performing below their compensation targets, and more conservative decisions from those overcoming those targets.

In addition to this expected direct effect, we argue that the effect of compensation framing induced by performance targets also affects risk taking indirectly through its influence on executive risk bearing. As noted BAM proposes that the effect of compensation framing on risk taking can be

explained partially by the effect compensation framing has on executive's risk bearing. According to Wiseman and Gomez-Mejia (1998) and Larraza-Kintana et al (2007) executive risk bearing may stem from threats to future employment as well as from threats to compensation devoted to support essential expenses. More specifically Larraza-Kintana and colleagues (2007) contend that the risk borne by an executive increases in the face of low prospects of being fired, stable compensation income and threats to anticipated pay viewed as essential by the executive. In all these cases it is the possibility of losing something valuable that is simultaneously viewed as reasonably secure that increases the executive's perception of risk. The desire of loss-averse individuals to protect anticipated gains is what prompts a more conservative behavior. Conversely when employment is at risk and thus future income is no longer secure, executives have less to lose, and hence would bear less risk. In this situation, executives may take risks in order to reverse the threat to employment and thus future income.

We predict that compensation framing relative to performance targets will exhibit a positive relationship with the degree of executive risk bearing , such that reaching performance targets will increase risk bearing. This occurs for several reasons. First, reaching the performance targets set in the compensation contract will reinforce perceptions of employment security. As observed by empirical studies the achievement of performance goals improves the executives' employment prospects with the company, while failing to reach them increases the probability of being laid off (Fredrickson, Hambrick and Baumin, 1988; Farrell and Whidbee, 2003). Research has shown a direct connection between employment security of executives and the amount of monetary rewards they may expect in the future, with greater employment security leading to greater expected rewards (Eckbo and Thornburn, 2003). Second, reaching the targets also increases the executive's monetary rewards, and may positively influence the CEO's belief about his/her own capacity to reach those objectives, and therefore receive the rewards associated to them, in the future (Bandura, 1982; Gist and Mitchell, 1992). In sum, reaching the performance targets included in the compensation contract will increase the amount of anticipated wealth the executive expects to receive from its

current position at the firm. This will raise concerns about the risk of losing something of value, therefore leading to higher risk bearing. The opposite will occur when the executive fails to reach those targets. As per the BAM risk bearing will show a negative relationship with risk taking. That is, greater risk bearing reduces risk taking while lower risk bearing increases risk taking. Hence, the effect of compensation framing induced by performance targets also affects risk taking indirectly through its influence on executive risk bearing.

Based on these arguments we predict that CEOs who are exceeding their performance targets are likely to pursue lower risk strategies, while CEOs who are missing their targets are likely to increase their preferences for risky strategies.

> ***Hypothesis 1:*** *When CEOs perceive firm performance to be above (below) the performance targets specified in the compensation agreement, CEOs will decrease (increase) risk taking. Such influence is partially mediated by risk bearing which augments (diminishes) when performance is above (below) targets.*

Peers Compensation

Peer salary has been suggested as an important influence on pay satisfaction and thus on agent behavior (Lawler, 2000). Equity theory (Adams, 1963; 1965) says that individual's behavior within the organization is affected by the perceived inequities in the pay/productivity ratio relative to other individuals who perform similar tasks in the same organization or in another one (i.e. peers). The evidence at the employee level (i.e. blue collar) is consistent with this idea, and suggests that it would be reasonable to extend it to the executive level (Finkelstein and Hambrick, 1996). O'Reilly, Wade and Pollock (2006) observed that inequity between the CEO's compensation and that of lower level managers was associated with higher rates of turnover for these employees. Though it may not be directly applicable to the case of individual decision-makers, the evidence observed at the organizational level also indicates that organizations' risk behavior is a function of

their performance relative to organizations with similar characteristics (which act as a reference group) (e.g. Fiegembaum and Thomas, 1988; Bromiley, 1991; Ketchen and Palmer, 1999).

Equity theory's suggestion for CEOs would be that their behavior is affected (significantly) by the difference in compensation with respect to a set of individuals that perform similar tasks in organizations of similar characteristics. In this sense, CEOs of firms with similar characteristics would constitute an important reference group for the CEO of a particular firm. Also, according to equity theory the CEO may compare his/her salary with other executives (non-CEO executives), even in his/her own firm, as long as the CEO perceives they are performing comparable tasks. Hence both, CEOs and non-CEO executives may compose this relevant reference group (i.e. peers).

Previous arguments indicate that the compensation received by these *peers* may constitute another relevant reference point for a CEO to frame his/her compensation. Other researchers such as Lant (1992) and Gomez-Mejia, Welbourne and Wiseman (2000), have also proposed that peer compensation may constitute a relevant reference point, although there is an absence of empirical examinations pertaining its behavioral effects. The CEO would perceive a gain context (positive framing) whenever his/her compensation is above the one received by his/her peers. Conversely, a loss context (negative framing) would be perceived if his/her compensation is below the compensation received by the reference group. In the first case, and following prospect theory and BAM contentions, we would expect a more conservative behavior on the side of the CEO. That is, we would expect him/her to show a willingness to select strategies with low risk. By doing this the CEO would intend to reduce the probability of suffering bad results, avoiding the possibility of a future reduction of his/her total compensation. In the second case, when compensation is below that of peers, a tendency towards the selection of riskier strategies is expected. In this case, he/she would pursue not only variable pay, but also increment increases in base pay in future wage revisions.

The above arguments also suggest that risk bearing may play a mediating role between framing and risk taking. Executives whose compensation exceeds that of peers will face greater risk bearing as they would perceive there is an above average amount of anticipated income that could

be lost. Conversely, the risk borne by the CEO would decrease when compensation is perceived to be below that of peers. In this case there anticipated pay is viewed as unsatisfactory thus leading to a perception that one has less to lose than if pay had exceeded one's reference of peer compensation. Greater (smaller) risk bearing will result in decreased (increased) risk taking. The following hypothesis summarizes all these ideas.

> ***Hypothesis 2:*** *When CEOs perceive compensation level is above (below) peers' compensation level, CEOs will decrease (increase) risk taking. Such influence is partially mediated by risk bearing which augments (diminishes) when compensation is above (below) that of peers.*

In sum, this hypothesis proposes that the compensation level in the market for executives has a direct effect on the CEO's strategic behavior, and more precisely, over his/her willingness to select strategic options with higher or lower risk. In this sense, this paper contributes to the literature on the determinants of risk taking, analyzing, as Wiseman and Gómez-Mejía (1998) point out, the influence of factors related to the market for executives.

METHODS

To test these hypotheses we used a sample of firms that issued an Initial Public Offering (IPO) in any of the USA stock markets in 1993, 1994 and 1995. This sample is appropriate for studying the influence of compensation design and framing on risk taking, as IPOs tend to show a greater variation in "key risk-bearing aspects of management compensation contracts" (Beatty and Zajac, 1994; pp. 315) than non-IPO firms. In addition, a CEO's influence on organizational objectives and company decision making process is most notorious among IPO firms since IPO firms are commonly young (MacCrimmon & Martens, 1999) and typically smaller than other public firms. Because of their relative youth and size, IPO firms tend to have less well established

organizational routines and behaviors, and it is not rare to observe that they are still run by their founders.

Our study combines data from different sources in order to capture both individual preferences and perceptions along with firm and industry level characteristics. The primary source of data comes from a survey sent to the CEOs of all companies issuing an IPO in 1993, 1994 and 1995, 1184 firms in all. The selection of this time frame satisfies two criteria. First, it provides a sizable population from which to obtain a sample, taking into account the usual response rates for mail questionnaires (around 10%). Thus, it provides a reasonable sample size to conduct meaningful multivariate analyses. In addition, , at the time the survey was conducted (1998) firms that had gone public during the period were old enough to assure access to public data sources from which information on firm performance and other firm level characteristics could be obtained. At the same time these firms were young enough to maintain variation in key risk related aspects typical to IPOs. Our survey procedurecombined mail surveys with a telephone follow-up to obtain a final sample of 108 responses (response rate = 9.25%). The typical survey 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 firm that issued the IPO. The survey based information is combined with information obtained from different archival sources including COMPUSTAT and CRSP data bases, as well as legal documents such as the firm's *Proxy Statements* and *IPO Prospectuses*. A statistical analyses comparing the sample to the population indicates that our sample reflects a random and representative of the firms issuing IPO during the years 1993, 1994 and 1995. The sample includes 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 ranges from 10 to 10,000 employees with an average size of 928, and a median size of 337 employees.

Variables in the Model

Compensation Framing Relative to Performance Targets. Laboratory examinations of problem framing have generally relied on choices among gambles having different risk-return characteristic (e.g. Kahneman & Tversky, 1979). Field research, on the other hand, has utilized archival data to capture problem framing as the difference between some arbitrary reference (such as industry average performance) and actual firm performance (Bromiley, 1991). Problems with laboratory measures are that they have not been shown to exhibit external validity (MacCrimmon & Wehrung, 1990). Field measures, on the other hand, generally assume a specific measure of performance (e.g., ROA) which may or may not be the performance measure of most interest to the CEO. Indeed, Zajac & Westphal (1997) note that compensation contracts utilize numerous and varied performance indicators in awarding contingent compensation. Thus, it is difficult to justify one performance indicator as relevant to all CEOs.

In order to avoid the problems of both laboratory and field measures, we developed two indicators of compensation framing that directly measure the extent to which a CEO believes he/she is performing above or below the performance targets included in his/her compensation contract. By framing performance around these targets we avoid the problem of trying to identify the particular performance metrics contained within the compensation contract. Further, we assume that the performance of most interest to the CEO is that which directly affects his/her income. The two items selected to capture problem framing are: "To the extent that performance targets are included in my compensation contract, I am out (under) - performing these performance targets." Responses were on a seven-point scale (1=strongly disagree to 7=strongly agree).

Compensation Framing Relative to Peers Compensation: Analogously, we developed two indicators that directly measure the extent to which the CEO believes his/her compensation level is below or above that of his/her peers'. The questions were stated as follows: "Most of the time I earned above (below) what my peers earned". The answers were given in a 7 point Lickert scale (1=strongly disagree to 7=strongly agree). With this instrument we avoid specifying, a particular reference group for the CEO (e.g. CEOs of firms in the same sector) which may not be the most

relevant for the CEO. Thus, we allow the CEO to define for him/herself the peer group they believe is the most appropriate reference for comparing compensation.

Risk Taking: Risk taking reflects the CEO's choice of investment risk from among the firms' investment opportunity set (Wiseman and Gomez-Mejia, 1998). As with measures of problem framing, measures of risk taking tend to fall into two categories: laboratory research, which generally observes individual risk taking behavior directly, and field research, which has generally relies on archival data to act as proxies for Top Management Teams (TMT) risk preferences. This latter approach often uses one or two indicators (e.g., R&D expenditures & diversification) as proxies for overall risk taking. However, since firms vary in their strategic orientations, focusing on one strategic option to capture risk taking may miss important strategic risks being managed by the firm. Further, due to differences in market power or industry conditions the perceived risk of any given option may also vary from firm to firm or industry to industry. For example, some studies assume that R&D expenditures reflect risk taking behavior (Palmer & Wiseman, 1999), though lack of R&D investment could be argued to have an equally disastrous effect on some firm's long-term survival (for instance, biotechnology companies). In fact, investments in R&D were found to be the least risky in the minds of the executives we surveyed.

To avoid the problems associated with imposing evaluative judgments about what is risky, we used the measure validated by Larraza-Kintana et al (2007) based on the previous work by Khandwalla (1977) and Singh (1986). This measure captures both the usage and perceived risk of various strategic options available to CEOs. This approach avoids limiting the choice of strategic options to one or two (which may not be appropriate for all respondents). Further, it avoids imposing a degree of risk on the option, but instead allows respondents to determine the options' riskiness to their business. Based on the results of a previous pretest the measure considers nine strategic options: 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) down-sizing through layoffs, g) increasing long-term debt, h) acquisition of a

business in an unrelated industry, i) increasing promotion and advertising. CEOs were 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 option." CEOs were then asked to indicate 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 option." The nine items used to measure the risk of various strategic options were found to be highly reliable and also exhibited high discriminate validity in the eyes of the CEOs.

CEO risk taking is then represented by a composite index that multiplies the "usage" score for each investment option by its "risk" score. These products are then averaged across all items to produce a composite index of risk taking for each firm. Greater usage of high-risk items produces a higher value, while greater usage of lower risk items or minimal usage of high risk items produces a lower value.

Risk bearing: Following Larraza-Kintana et al (2007) we distinguish between perceived employment risk, downside risk of essential pay and variability of essential pay. The CEO's *perceived employment risk* was measured using responses to the following statement: "There were years where I believed my employment security was at risk." Responses were on a seven-point scale (1=strongly disagree to 7=strongly agree). The correlation between CEO perceived employment risk and prior CEO transitions is 0.282 (p-value=0.004)[2]. To measure *downside risk of essential pay* we first asked CEOs to indicate the percentage of each type devoted to essential expenses. Next we asked them 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 final value of downside risk of essential pay was calculated by multiplying the percentage of pay used for essential expenses by the downside risk of that pay, and averaging these products across the five types of pay. The higher the value of this index, the greater the risk to pay that is largely devoted to essential expenses. To measure

variability of essential pay CEOs were asked to indicate "the extent to which this pay item has varied over the years since the IPO" (1=pay does not vary from year to year; 6= pay is extremely variable over time; almost unpredictable). The variability scores (for salary, annual bonuses, and so forth) were then multiplied against the percentages of each type of pay devoted to essential expenses. These products were then averaged across the five pay types to produce a variability of essential compensation index. A high score on this measure corresponds to high variability in those elements of compensation that are largely devoted to essential expenses.

Control Variables: We control for the value of stock options held by the CEO, CEO age firm performance relative to the industry average (relative performance), pay mix (variable/total pay), firm size, financial structure and CEO stock ownership (Fiegembaum, 1990; Gomez-Mejia and Balkin, 1992; Gooding et al., 1996, Larraza-Kintana et al., 2007, Gomez-Mejia, Makri and Larraza-Kintana, 2010). *Value of stock options* was measured by taking the average value of options held, as reported in the firm's proxy statement over three years (1995-1997) [3]. 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 & Scholes, 1973) at 0.921 ($p<0.001$) and with values obtained by valuing stock options at 25% of their exercise price (Lambert, Larcker & Weigelt, 1993) at 0.943 ($p<0.001$). *CEO Age* is the age of the CEO in 1997 (as reported in firm's proxy statement). Firm's *Relative Performance* is measured as the average difference between the firm and the industry average ROA over the five years from 1993 to 1997. *Pay mix* was measured as 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 of 1993-1997 (Gómez-Mejía and Balkin, 1992). Only compensation received by the CEO while holding the CEO position was included in this calculation. Partial year compensation was also

[2] Larraza-Kintana et al (2007) used a dichotomized version of this variable. Given that the methodology used in the analyses, Structural Equation Models (SEM), was developed under the assumption of continuous variables, and that at least 4 point scales are needed to safely assume continuity (Bagozzi and Baumgartner, 1994), we used a 7 point scale

excluded. *Firm size* was measured as natural logarithm of firm's total assets. The ratio of long term debt to total assets is used to control for firm's *financial structure*. Finally we control for CEO ownership with the percentage of firm equity held by the CEO in 1997 (*CEO ownership*). This was the only year in which this information was available for all the CEOs in our sample.

Structural Equation Modeling

The models were estimated using EQS (Bentler, 1995). The methodology of Structural Equations Models (SEM) allows the researcher to estimate models in which all, or some of the variables (called factors) cannot be measured directly (Bollen, 1989; Bagozzi and Baumgartner, 1994; Bentler, 1995). Further, this methodology considers both measurement and structural equations issues, through the combination, in a single model, of theoretical latent constructs (i.e. not directly observable) and observable indicators (Hayduk, 1987). In addition it easily accommodates relations among the explanatory variables of the model, allowing the joint estimation of systems of equations,

Following standard procedures we estimate the model in two stages. First, we explore the factor structure of the multi-item construct in our model. Specifically and given the nature of our data set we seek to confirm the existence of three separate latent factors representing the framing of compensation relative to performance targets included in the compensation contract, the framing of compensation relative to peer compensation, and risk bearing. Second, we estimate the structural model and compare it with a baseline null model. The specification for this structural model is based on the hypothesis established before and the results of previous work in the area. This model allows us to test the accuracy of our hypothesized relationships.

Measurement Model: Table 1 shows the correlation, mean and standard deviation of the variables included in the analysis. As expected the correlations between some of the indicators of framing and risk bearing are high. In particular, the correlation between the two indicators of compensation framing relative to peer compensation is negative and significant (r=-0.708; p-

[3] This value is expressed in millions of USA dollars. In this way the variance of this variable is similar to the variance of other variables included in the model. This facilitates estimation (Bentler, 1995).

value<0.01). Similarly, the indicators of compensation framing relative to the performance goals included in the compensation contract are also negative and significant (r=-0.716; p-value<0.01). The correlation between variability and downside risk of essential pay is positive and significant (r=-0.687; p-value<0.01). The correlation of the third indicator of risk bearing, perceived employment risk, with variability of essential pay is significantly different from zero (r=0.211; p-value<0.05) but not the correlation with downside risk of essential pay (r=0.076).

We first estimate a measurement model containing three factors: compensation framing relative to performance targets included in the compensation contract, compensation framing relative to peers compensation, and risk bearing. As described previously we have two indicators for the first two factors and three for the third one. Table 2 includes the global fit indexes for all the structural models estimated in this paper[4]. Taken together this model shows strong global fit. However, while factor loadings for items reflecting compensation framing factors are above the standard 0.7 cut-off, the standardized values for the risk bearing items are below that threshold. In line with the arguments by Larraza-Kintana et al (2007), this suggests that risk bearing may be a multidimensional construct, best represented by modeling each dimension separately rather than through a single underlying factor.

[INSERT TABLE 1 ABOUT HERE]

Given this we estimate a two factor model that contains the two compensation framing factors. As it can be seen in Table 1 probability for the $\chi^2_{S\text{-}B}$ index clearly exceeds the 5% cut-off,

[4] The χ^2 (Chi-square) statistic tests how well the model fits the data. EQS calculates the probability, under the assumption that the model is correct, of obtaining a larger value of the χ^2 statistic. When such probability exceeds a standard cut-off in the χ^2 distribution (such as 0.05 or 0.01), we can say that the overall fit of the model is good. RMSEA (Root Mean Square Error of Approximations), is similar to the χ^2 test, but assumes that the model holds approximately in the population (instead of perfectly). Lower values of RMSEA indicate a better fitting model, such that values below 0.08 indicate a good fit. The CFI (Comparative Fit Index) and the IFI (Incremental Fit Index) are based on the comparison of the χ^2 statistic for the proposed model and a null model. These two indexes reflect fit relatively well at all sample sizes (Bentler, 1995). Values of GFI (Goodness of Fit Index), CFI and IFI approaching 1 indicate a better fit. Values of these three indexes exceeding 0.95 are understood to indicate good overall fit, while values between 0.9 and 0.95 would be supportive of an accurate fit. The SRMR (Standarized Root Mean Squared Residual) is also provides a measure of the ability of the proposed model to replicate the observed data. Values approaching zero indicate a better fit, with 0 indicating a perfect fit. Values between 0 and 0.05 are indicative of good overall fit, while values between 0.05 and 0.1 would indicate that the proposed model provides an adequate fit (Hull and, Chow and Lam, 1996). Finally, "Probability" permits us to evaluate whether the reduction in χ^2 for nested models is significant or not. Values below 0.05 indicate that the reduction is significant at 5% significance level.

showing that the model offers good global fit (Prob[$\chi^2_{S\text{-}B}$]=0.25673>0.05). The CFI_R (0.991) also exceeds its usual 0.95 cut-off. The values of the RMSEA, CFI, IFI, GFI and SRMR indexes indicate that, in general (see Table 2) the measurement model is accurate. Further, this model shows an important reduction in the value of χ^2 relative to the baseline null (χ^2=150.437 with 6 d.f.; $\Delta\chi^2$=141.993) which is a clear indicator of the accuracy of the measurement model. Figure 1 shows the standardized solution of the measurement model for the two latent factors (F1 and F2) that approach compensation framing.

[INSERT FIGURE 1 ABOUT HERE]

The factor loadings are significant at the 0.1% significance level. As presented in Figure 1, all indicators exhibit standardized coefficients above 0.7, supporting convergence validity (Fornell, 1982). Construct reliability is also high, given that the values of the Bagozzi-Yi (1988) index are all above the usual 0.6 cut-off (0.71 for F1 and 0.75 for F2). The correlation between those two factors (F1 and F2) was not significant (r=0.142; p-value>0.1), suggesting independence among factors, and demonstrating time discriminate validity. Taking into account the preceding results we can say that, F1 indicates the extent to which the CEO perceives he/she is over-performing the targets included in his/her compensation contract (compensation framing relative to performance targets), while F2 might be interpreted as compensation framing relative to peers compensation. Minimum potential value for F1 and F2 is 1 and maximum is 7. The greater the value of F1 or F2 the more positive is compensation framing. Conversely, smaller values of F1 or F2 indicate negative compensation framing. Finally, we individually incorporate each of the various facets of risk bearing into the model rather than as a single construct.

Structural Model: Global Fit Indexes: Table 2 offers a summary of global fit indexes for the baseline null model, the structural model, the structural model after having dropped some non-significant parameters and the final model that results after the addition of a significant relationship suggested by the Lagrange Multiplier test of the original model. As observed in Figure 2, the initial model representingthe previously advanced hypotheses, specifies a direct negative effect of F1 and

F2 on risk taking as well as an indirect effect through its influence on the different elements of risk bearing.

[INSERT TABLE 2 ABOUT HERE]

Given that the variable that measures the average proportion of variable pay over total pay may be interpreted as the percentage of pay that comes from contingent sources, it seems reasonable to suggest that percentage will influence CEO's compensation framing (F1 and F2). To control for this potential effect, the structural model specifies that relationship. Also, Wiseman and Gómez-Mejía (1998) indicated that framing may influence risk taking to the extent to which CEO's wealth is dependent on firm performance. The model controls for that potential influence specifying the direct effect of firm's relative performance on compensation framing (F1 and F2).

Notice that all models include the estimation of certain covariances (among exogenous variables) that are significantly (p<5%) different from zero. In this way we control for their effect. Specifically, when appropriate we estimated covariances between the value of stock options and the percentage of variable pay over total pay, between downside risk and variability of essential pay, and between CEO age and variability of essential pay.

Table 2 shows the global fit indexes for the baseline null model and the structural model. The latter is represented in Figure 2. According to the change in the χ^2, the proposed model (i.e. initial model) significantly improves the fit of the null model ($\Delta\chi^2$ =281.118; p <0.001). This means that the structural relations of the model are, as a whole, meaningful. This improvement relative to the null model is also supported by the global fit indexes, which are all better for the structural model. While the global fit indexes support the idea that the structural model improves the baseline null model, we cannot conclude that the global fit is satisfactory. As it can be seen that some of the indexes are above the minimum thresholds while others (e.g. RMSEA) are not. This lack of a consistent support for model fit can be due to the existence of non-significant parameters in the model or/and the absence of other significant relationship. In searching for a better representation of the structure of relationship underlying the data we follow a standard procedure in SEM and look at

the Wald and the Lagrange Multiplier (LM) tests. This allows us to evaluate the relative improvement in global fit (Bollen, 1989). In particular the Wald test, indicates which relationships in the model that can be eliminated (i.e. fix their association equal to zero) without suffering a significant reduction in global fit. That is, the Wald test provides information for creating a more parsimonious model. On the other hand, the LM test identifies new relationships among the variables, that were omitted in the initial model, which if added, would improve global fit. However, it is important that any new relationships be theoretically meaningful.

[INSERT FIGURE 2 ABOUT HERE]

The Wald test suggests that the global fit could be improved by dropping some non-significant relationships. In responding to this information we proceeded to drop non-significant relationship a one at a time. As it can be seen in Table 2 the resulting structural model offers better global fit, with all the global fit indexes now improved and largely satisfying the criteria for good model fit. In addition, this revised model exhibits a significant improvement over the baseline null model.

In addition, the LM test suggests that the value of stock options held by the CEO may influence F2. This suggestion seems reasonable since the higher the value of a CEO's stock options the greater the amount of their total compensation, and therefore the higher the probability s/he may perceive his/her earnings to be above that of his/her peers.[5] As seen in Figure 3, adding an association linking the value of stock options to F2 improves model fit over that of the initial model. Global fit indexes for this final model (see Table 2) indicate that the model offers an adequate representation of the true structure of relationship, showing global fit indexes that are better than the ones observed for the initial model, and the reduction in χ^2 is also significant ($\Delta\chi^2 = 4.728$; $p < 0.05$). Therefore, this new specification offers a better picture of the relationships existing within our

[5] We may also think that, as the value of stock options may be viewed as an indicator of the extent to which the CEO's options are exceeding their strike price and thus going "deeper into the money." This would also an influence F1. However, compensation contracts include a variety of performance goals (Westphal and Zajac, 1997). Hence, we would expect a relationship like this only if performance targets mostly reference the value of firm's stock. We note that including this relationship in the model didn't improve model fit, nor was the association significant. This finding agrees with the idea that compensation contracts specify a large variety of performance targets.

sample. Importantly, as we will comment next, the conclusions regarding the hypotheses of the study remain consistent regardless of which structural model is used.

[INSERT FIGURE 3 ABOUT HERE]

Structural Model: Hypothesis Testing: As Figure 2 and 3 show the direct effect of F1 (i.e. compensation framing relative to the performance targets) on risk taking is non-significant. However, it has an indirect negative effect on risk taking since F1 has a negative and significant effect on CEO's perceived employment risk. The effect of F1 on the other two elements of risk bearing, namely variability and downside risk of essential pay, is non-significant. Therefore, we only obtain partial support for Hypothesis 1. As per Hypothesis 2, the direct effect of F2 on risk taking is negative but non-significant. The indirect effect, through its influence on three dimensions of risk bearing, is also non-significant. Therefore this hypothesis is rejected. Looking globally, we obtain some evidence supporting the idea that compensation framing influences risk taking. Further, it provides support for the BAM's proposition that this effect is partially mediated by risk bearing. More specifically our results indicate that in the case of compensation framing relative to performance targets such mediation is more likely through the employment risk component of risk bearing. Our evidence also shows that although CEOs may consider different reference points (i.e. decision frames) to determine whether they face losses or a gains (i.e. negative or positive framing), not all the reference points will have influence the CEO's risk taking behavior. More precisely, and in light of the results presented in Figures 2 and 3, CEO risk taking appears to be influenced (indirectly) by compensation framing when the reference point is composed by the performance targets included in the compensation contract. This indirect effect is through the influence of F1 on a CEO's perceived employment risk. Further, this particular framing (F1) is the only one influenced by firm performance (ROA).

The effects of the control variables included in our study are consistent with expectations. CEO age has a negative effect on risk taking, as well as the value of stock options. The proportion

of variable pay over total pay shows a positive relationship with F1 and F2. Finally relative performance has a positive effect on perceived employment risk and F1, however presents no relationship with F2.

CONCLUSIONS AND DISCUSSION

The present study analyzes the framing of compensation induced in the CEO by the level of compensation and the performance targets included in the CEO's compensation contract, and their influence over the CEO's willingness to select strategies with more or less risk. The empirical results support the existence of such influence. However, not all the reference points that CEOs may use to gauge satisfaction with the pay are equally salient. In particular, while compensation framing relative to the performance targets included in the compensation contract affects (indirectly) risk taking, compensation framing relative to peers compensation (i.e. the pay level in the market for executives) doesn't have any effect. In other words, the performance targets included in the CEO's compensation contract, unlike that of peers, induce perceptions of gains or losses that influence the level of risk selected by the CEO.

Further, compensation framing relative to the performance targets included in the compensation contract is also the only reference that seems to be influenced by firm's relative performance. This suggest that although a gain situation may induce a different response (relative to a loss situation) in the CEO, he/she only has incentives to alter the risk implicit in his/her strategic decisions on behalf of the firm, when framing is dependent on firm's results. In other words, F1 influences risk taking because, due to the relationship of the later with firm relative results, it is possible for CEOs to correct (protect) the negative (positive) situation of their compensation through the selection of different strategic alternatives. Here we are implicitly assuming that the CEO perceives his/her decisions influence firm performance. Consistent with prospect theory, it is precisely the possibility of recouping what has been lost (or to maintain what it has been achieved) that motivates the selection of different courses of action (i.e., take or avoid risk). A loss-averse

individual facing a loss context will select an option that allows him/her to overcome that negative situation, even if that option involves greater risk. In this sense the evidence observed in this paper is consistent with the predictions of *Expectancy Theory* (Vroom, 1964). This theory suggests that one person's motivation to act in a given way is a function of the relationship existing between the actions and the rewards received, and the value attached to those rewards.

The results obtained in this analysis highlight the importance of the contract as a tool to influence the risk taking behavior of the CEO, and suggest implications for the design of the firm's governance mechanisms. If the board of directors wants to alter the risk taking posture of the CEO, it may be achieved by adjusting the performance targets included in the compensation contract of the CEO. However variations in the level (i.e. total compensation) will not have any effect over the risk taking behavior, because as the empirical analyses have shown, the CEO's risk taking behavior is independent of the pay level observed in the market for executives[6].

The implication of our results for research on prospect theory and related theories (e.g. BAM) are clear since we have empirically showed that risk behavior is dependent on the selected reference point. The identification of the relevant reference point (or points) to frame each situation (e.g. compensation, personal wealth) is key if we want to understand or explain the risk behavior of the decision makers. If the wrong reference point is chosen, we will observe no effect on behavior.

Our results have also stressed the importance of the mediating role of risk bearing. Interestingly, the analyses reported suggest that not all the elements of the risk bearing construct play the same mediating role. This is important as it suggests that rather than increasing or decreasing global risk bearing, compensation framing, influences specific facets of the risk bearing concept. Even more, depending on the reference point the executive considers when framing compensation, the dimension of the risk bearing construct affected may change. Akin to the notion that external stimuli influence different areas of the human brain, different compensation frames may have an effect on different dimensions of perceived risk (i.e., risk bearing construct).

[6] This doesn't mean that a CEO's behavior is not influenced by differences in compensation relative to peers. For example those differences may affect a CEO's willingness to stay in their current firm or move to a new job.

Specifically we have observed that when compensation is framed relative to the performance targets included in the compensation contract, perceptions of employment risk change, but not perceptions about compensation risk.

On a separate matter it may be argued that performance based compensation contracts can also promote the selection of riskier strategies even assuming that individuals are risk averse (e.g. Grinblatt and Titman, 1987; Starks, 1987). In particular such behavior would be observed among risk averse managers, when performance-based fees are asymmetric (i.e. a base salary is assured, and good performance increases compensation while bad performance has no consequences) but not necessarily when they are symmetric (i.e. under performance has penalties). In any case the goal of the present paper is not to show whether individuals are loss averse or consistently risk averse. We ground our hypotheses in the evidence that shows that individuals' behavior under uncertainty is better characterized assuming loss aversion than assuming risk aversion (Kahneman and Tversky, 1979). Considering this as a starting point, it is proposed that the characteristic of the compensation contract (performance targets, pay level) provoke perceptions of gains or losses that influence the risk taking behavior of the CEO, comparing the effects of two different reference points and discussing the implications for compensation design. Whether we should characterize individuals as loss averse or risk averse when studying the influence of compensation contracts on risk behavior, whether the compensation contracts of real CEOs are symmetric or asymmetric, or whether behavioral approaches tell us something new about compensation design, are issues (very important ones) that should be addressed in other studies.

To conclude, notice that the analysis presented so far doesn't control whether the selection of riskier strategies is due to the higher expected return associated with the strategic option selected. The absence of such control may be seen as a potential limitation of the analysis. However it must be noticed that our focus is specifically on risk, and that both prospect theory and BAM, offer propositions for the relationship between framing and risk, independent of the expected return. Prospect theory assumes that individuals take decisions that maximize their value function. Such

decisions balance both risk and return. Prospect theory and BAM predict that in loss contexts (i.e. negatively framed situations) the strategic options selected would be riskier than the ones selected in gain contexts (i.e. positively framed situations). This is precisely what the analyses performed in this article intended to capture.

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Table 1: Mean, Standard Deviation and Pearson's Correlations

ID	Variable Name	Mean	Std. Dev.	1	2	3	4	5	6	7	8
1	CEO Age	49.890	8.925	1.000							
2	Over Performance Target	4.822	1.584	0.136	1.000						
3	Under Performance Target	2.931	1.785	-0.040	-0.716**	1.000					
4	Over Peer's Compensation	2.589	1.554	0.033	0.145	0.091	1.000				
5	Under Peer's Compensation	4.764	1.925	0.131	-0.066-	0.182	-0.708**	1.000			
6	Perceived Employment Risk	3.606	2.143	-0.095	-0.230*	0.325**	-0.127	0.170	1.000		
7	Risk Taking	16.387	4.810	-0.261*	-0.142	0.057	-0.151	0.111	0.221*	1.000	
8	Variability of Essential Pay	2.771	2.438	0.211*	0.001	0.065	-0.064	0.163	0.068	0.187	1.000
9	Downside Risk of Essential Pay	2.604	2.275	0.076	-0.049	-0.010	-0.029	0.083	0.098	0.011	0.687**
10	Options Value (millions $)	1.728	4.734	0.068	0.263**	-0.238*	0.319**	-0.234*	-0.174	-0.202*	0.211*
11	Variable Pay/ Total Pay	0.366	0.250	-0.052	0.207*	-0.345**	0.296**	-0.306**	-0.198	0.021	0.074
12	Relative Performance	-0.142	0.105	0.065	0.240	-0.280	0.126	-0.111	-0.531**	-0.124	-0.039
13	Firm Size (ln)	3.712	1.514	-0.074	-0.108	0.134	0.087	0.014	0.190	-0.086	-0.073
14	Debt/ Total Assets	20.188	21.087	-0.040	0.063	-0.068	-0.025	0.096	0.026	-0.093	-0.041
15	CEO Ownership	0.104	0.120	0.117	-0.021	0.100	-0.206*	0.215*	-0.254	0.128	0.151

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

ID	Variable Name	9	10	11	12	13	14	15
9	Downside risk of essential pay	1.000						
10	Options Value (millions $)	0.047	1.000					
11	Variable Pay/ Total Pay	0.141	0.391**	1.000				
12	Relative Performance	-0.196	0.193	0.151	1.000			
13	Firm Size (ln)	-0.020	0.018	-0.027	-0.176	1.000		
14	LT Debt/ Total Assets	0.045	0.102	0.204	-0.057	0.106	1.000	
15	CEO Ownership	-0.040	-0.129	-0.294	0.072	-0.078	-0.164	1.000

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

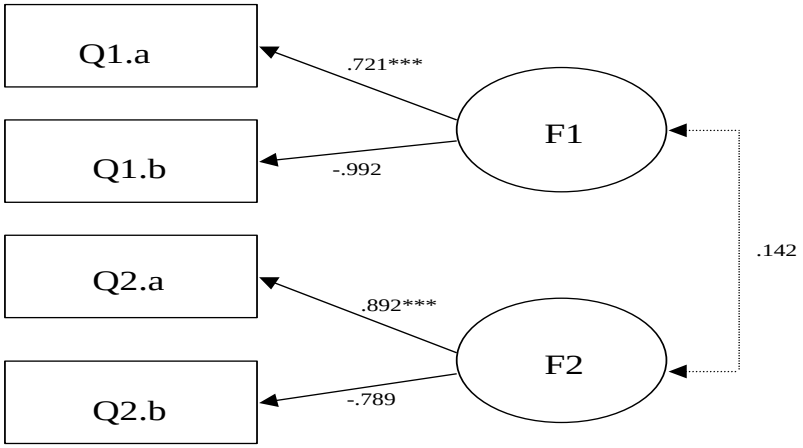
Table 2: Global Fit Indexes

Model	χ^2	Degrees of Freedom (df)	RMSEA	SRMR	GFI	CFI	IFI	Chage in χ^2	Difference in gl	Probability *
Three Factor Measurement Model	27.023	13	0.100	0.087	0.937	0.999	0.999			
Two Factor Measurement Model	9.444	3	0.147	0.030	0.956	0.955	0.956			
Baseline Null Model	465.046	105	0.179	0.185	0.646	0.000	0.000			
Structural Model	183.928	80	0.110	0.114	0.840	0.984	0.984	281.118	25	< 0.001
Structural Model Dropping Parameters	115.056	83	0.060	0.090	0.882	0.995	0.995	349.990	22	< 0.001
Final Structural Model	110.328	82	0.057	0.087	0.886	0.996	0.996	4.728	1	< 0.05

* Probability of observing a Change in Chi-square greater than the reported "Change in Chi-square", for a variable that follows a Chi-square distribution with "Difference in d.f." degrees of freedom. Probabilities are stated in inequality terms as chi-square tables are sparse.

Figure 1: Measurement Model for Two Factors

Standardized Solution



F1: CEO's perception about the degree of achievement of the performance targets included in the compensation contract.

Q1.a: "To the extent that performance targets are included in my compensation contract, I am out-performing these performance targets"

Q1.b: "To the extent that performance targets are included in my compensation contract, I am under-performing these performance targets"

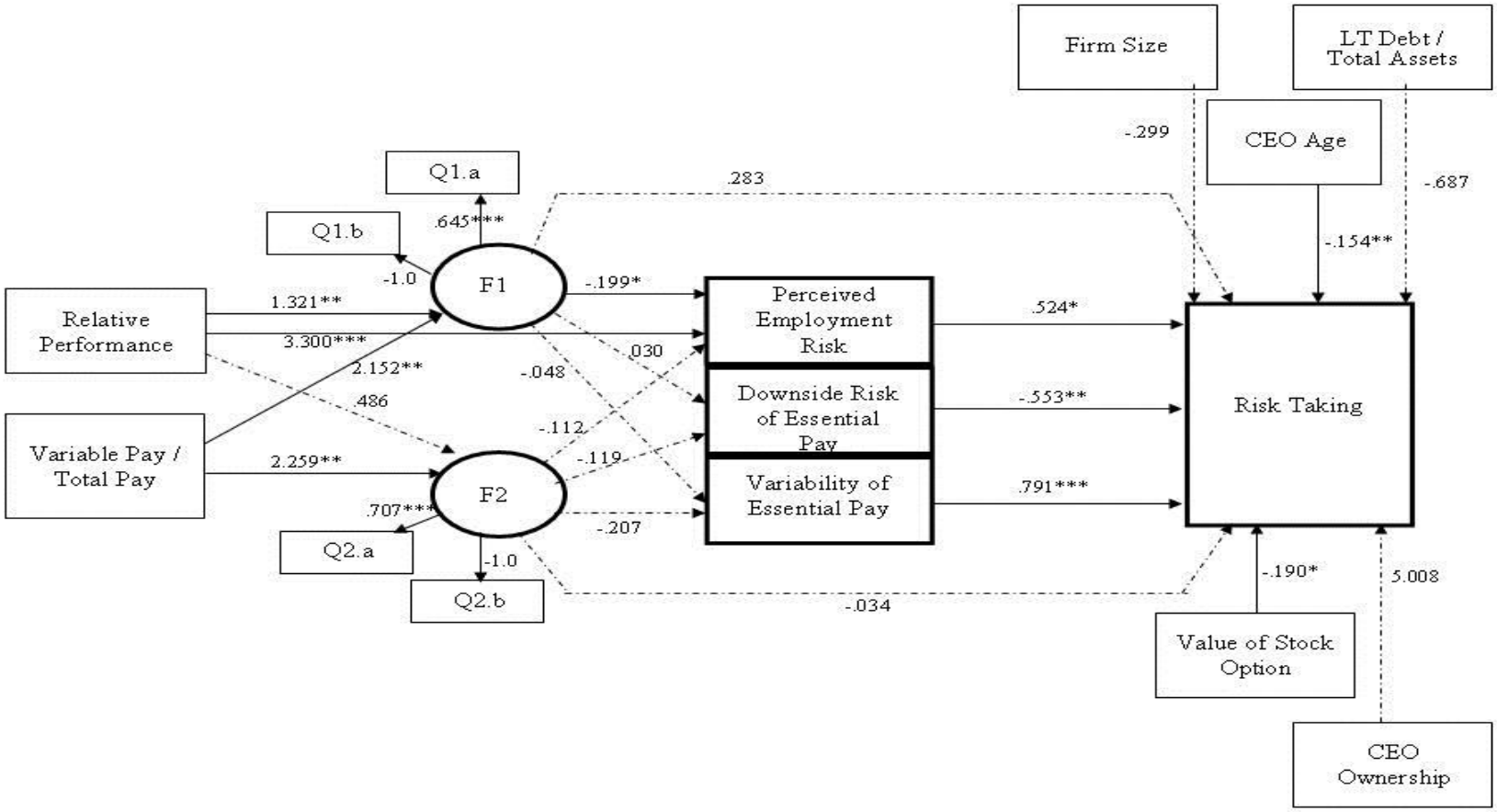
F2: CEO's perception about his/her compensation level relative to peers.

Q2.a: "Most of the time I earned above what my peers earned"

Q2.b: "Most of the time I earned below what my peers earned"

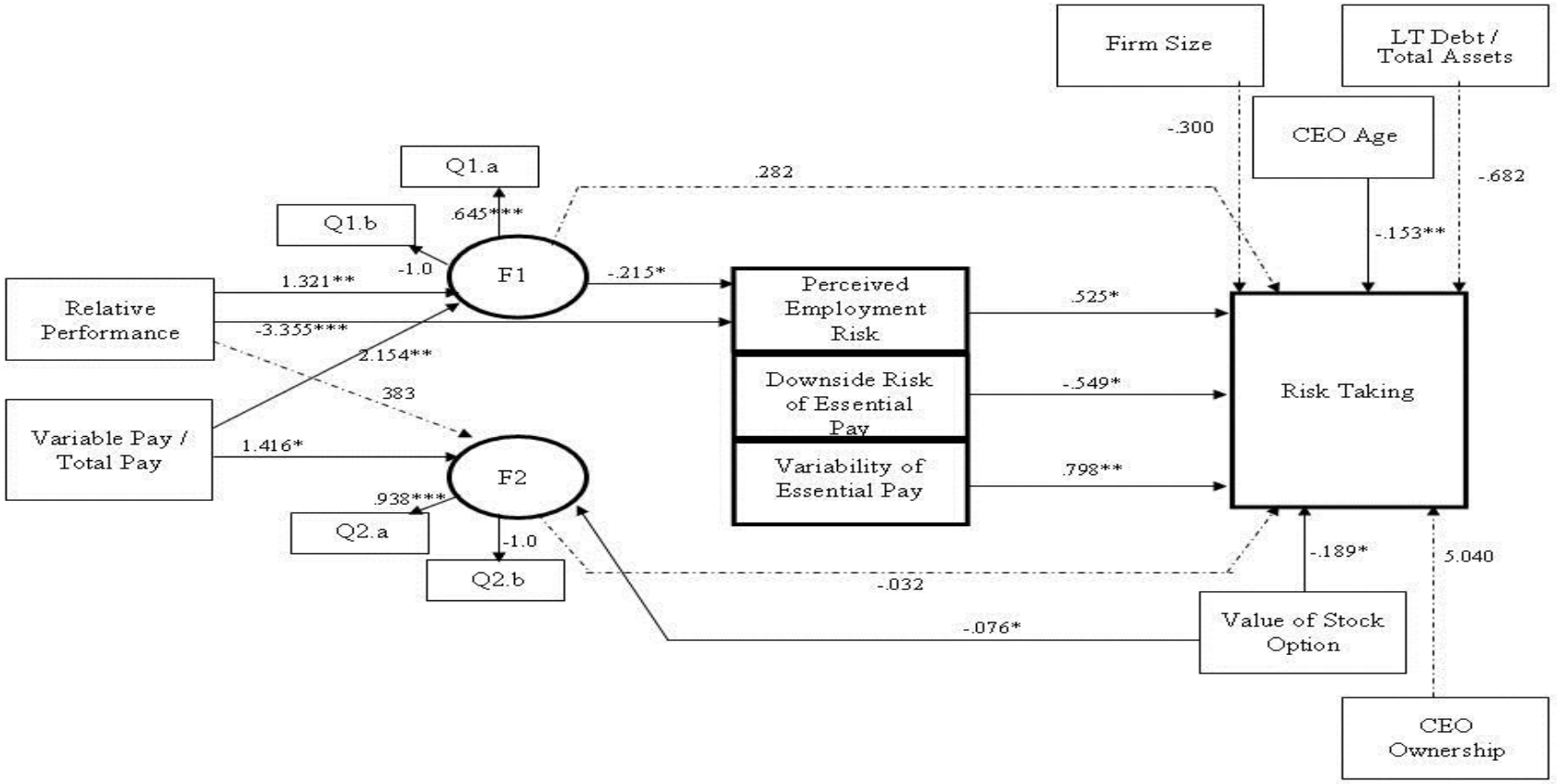
*** $p < .001$

Figure 2: Structural Model: Two Different Reference Points
Non-Standardized Solution



F1: CEO's perception about the degree of achievement of the performance targets included in the compensation contract.
F2: CEO's perception about his/her compensation level relative to peers.
* $p < .05$, ** $p < .01$, *** $p < .001$
-·-·- : Non-Significant effect.

Figure 3: Final Structural Model: Two Different Reference Points
Non-Standardized Solution



F1: CEO's perception about the degree of achievement of the performance targets included in the compensation contract.
F2: CEO's perception about his/her compensation level relative to peers.
* $p < .05$, ** $p < .01$, *** $p < .001$
-·-·- : Non-Significant effect.