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STOCK-OPTION-BASED EXECUTIVE COMPENSATION PLANS AND LODGING FIRMS' RISK-TAKING

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This study investigates the impact of stock-option-based (SOB) executive compensation by lodging industry firms on risk-taking, and whether or not perceptions of the risk firms face affects the design of CEOs' compensation contracts. The data analyzed include market-based risk measures and executive compensation for 98 firms over the period from 1992 to 2005 (totaling 734 firm-CEO observations). The study examines research questions by using three-stage least squares in estimating a two-equation simultaneous equation system, in which both firm's risks and compensation structures are endogenous. Risk is measured by total risk and idiosyncratic risk. Results show that contracts with large versus small bonus-option components induce risk-taking and in addition, perceptions of firms' risk do substantially impact the design of compensation contracts.

Keywords: *Option-based compensation, risk, executive compensation, compensation structure, lodging industry*

JEL Classification: L83, M1, O1

INTRODUCTION

Executive compensation plans and firm risk-taking are of great interest to various corporate stakeholders and regulators. Regulators have a strong desire to protect the integrity of the financial system by monitoring and controlling institutional risk-taking. The literature examines the linkage between these two managerial discretions— risk-taking and executive

compensation –along two lines of research. The first line relates to whether and how the compensation structure, the compensation level, or both induce risk-taking behaviors (Agrawal, Makhija, & Mandelker, 1991; Aggarwal & Samwick, 1999; Chen, Steiner, & Whyte, 2006; Houston & James 1995; Jensen & Murphy, 1990a, 1990b; Mehran, 1995, Fotiadis & Vassiliadis, 2013). The second thrust of research examines whether or not perceptions of risk affecting a company plays a significant roles in the design of CEO compensation contracts (Grace, 2004; Mehran, 1995; Smith & Watts, 1992).

This research integrates the two lines of research in studying the lodging industry. The mixed empirical results in prior studies and the limited inquiry on the subjects motivated investigating the association between risk-taking and compensation structure (Stylos & Vassiliadis, 2011). The remainder of this paper is organized as follows. Section 2 provides a literature review. Section 3 presents hypotheses. Section 4 presents the data sources and method, Section 5 presents empirical results, and Section 6 concludes the paper.

LITERATURE REVIEW

A number of executive compensation studies focus on the executive pay-performance relationship in tourism/hospitality related industry. Gu and Choi (2004) examine CEO compensation determinants in the casino industry. Their study suggests that the casino industry can maximize shareholder wealth if it ties executive pay to revenue efficiency. To put tourism hospitality compensation in context, Sturman (2001) recognizes that executive pay is lower in the hospitality industry than in other industries while Kefgen and Mahonet (1996) find that casino executives receive compensation that is almost 10% more than their hotel and restaurant counterparts.

The research by Kim and Gu (2005) is based on agency theory. They examine antecedents of CEO cash compensation designs in the U.S. restaurant industry. Results of their study suggest that to mitigate the agency problem and enhance firm value, the restaurant industry should tie CEO cash compensation to profitability and stock performance. Furthermore, they find that CEOs of large versus small firms receive higher compensation and that revenue efficiency positively affects CEO *compensation in the restaurant industry. Kim and Gu's (2005) findings are consistent with earlier studies* (Carr, 1997; Cooley, 1979; Core, Holthausen, & Larcker, 1999; Elston & Goldberg, 2003; Finkelstein &

Hambrick, 1989; Mangel & Singh, 1993; McKnight, 1996; Riahi-Belkaoui, 1992).

The effects of risk on compensation could depend on whether or not compensation relates mostly to pay or mostly to incentives. Research on the relationship between risk-taking and executive compensation is limited in lodging-and-casino industry. Rogers (2005) analyzes the effect of risk-taking incentives on the incidence of executive stock option re-pricing in the casino industry. The results suggest that managerial risk-taking incentives positively affect the decision to re-price stock options in compensation designs, a finding that is consistent with the hypothesis that managers whose incentives aligned less with those of shareholders are more likely to have options re-priced. All else being equal, incentive-related compensation likely associates more closely with a firm's risk-taking level than does pay-related compensation. In addition, based on the managerial risk aversion hypothesis, managers of high-risk firms demand higher pay to compensate for the uncertainty of future employment.

Empirical findings relating to risk-taking and compensation are mixed. The effects of firm risk on executive compensation rely on two lines of reasoning: the principal-agent model and the asymmetric information hypothesis. Garen (1994) develops a model examining the determinants of the level and structure of executive compensation in light of the principal-agent theory. Garen modifies the agency model to allow for CEO control over investment projects which therefore allows the CEO to influence the variability of the firm's income by choosing safer or riskier ventures. However, Garen (1994) finds that none of his models show a significant relationship between risk and compensation. Mehran (1995) also finds no significant impact of firm risk on the ratio of equity-based compensation to total compensation. Research by Smith and Watts (1992) suggests no significant association between the extent of firms using bonus or stock option designs and firm risk. On the other hand, Core et al. (1999) find that higher executive compensation levels are negatively related to governance (i.e., risk reduction). Grace (2004) concludes that firm risk is one essential determinant in the design of executive compensation contracts. Particularly, Grace (2004) finds that the higher the level of firm risk, the greater the use of incentive compensation. This is taken to imply a positive effect of firm risk on incentive compensation.

The two-way relation between firm risk and executive compensation suggests an endogenous relationship between these two managerial decisions. Using banking industry data, Chen et al. (2006) provide evidence supporting the endogenous relationship between firm risk and

option-based executive compensation. Pursuing endogenous relations is an important innovation involving using a simultaneous equation model in which risk and compensation are endogenous variables and managerial decisions about these two separate issues are jointly determined (Chen et al., 2006; Marx, Mayers, & Smith, 2001).

Various findings exist for industries where the matters being pursued have been the subject of research. Houston and James (1995) conclude that SOB compensation structure in the banking industry does not promote risk-taking. This is explained by bank chief executive officers (CEOs) who receive less cash compensation, are less likely to participate in stock option designs, and receive a smaller percentage of their total compensation in the form of stock options than do their counterparts in other industries. John et al. (2000) stress theoretical arguments highlighting the continuing viability and importance of an empirical investigation into the relation between executive compensation and risk. They contend that regulations of bank risk-taking based on imposing capital requirements and restricting asset choices limits regulatory effectiveness. John et al. (2000) demonstrate that, unlike capital and asset regulations that indirectly affect managerial decisions, altering the compensation structure provides a direct method of influencing managerial risk-taking incentives.

Research Motivation and Hypotheses

As already noted Rogers (2005) results suggest that managerial risk-taking incentives positively affect the decision to re-price executive stock options. For the lodging industry, then an issue is whether the compensation structure in the lodging industry affects managerial risk-taking invites further inquiry. Pursuing this issue does not ignore studies in the hospitality literature having examined executive compensation and performance (e.g., Barber, Ghiselli, & Deale, 2006; Gu & Choi, 2004; Kim & Gu, 2005; Madanoglu & Karadag, 2008, Fotiadis et al, 2013). Quantitative examination of the endogenous relation between SOB executive compensation packages and firm risk-taking is breaking new ground in tourism and hospitality research.

Even where there is work on SOB executive compensation packages and firm risk-taking disparate results appear in the literature. Houston and James (1995) investigate whether compensation in the banking industry, relative to other industries, is structured to promote risk-taking. Their results do not support the hypothesis that compensation structure in the banking industry promotes risk-taking. However, Chen et al. (2006) analyze the impact of compensation on risk across banks and conclude

that stock option-based executive compensation does promote risk-taking. Such contradicting results found in the banking literature show that this research is not simply trying to show that a result found for other industries applies to lodging. In addition, this paper contributes to the lodging literature by extending the existing literature that focuses more on the compensation-performance relationship.

Executive compensation consists of salary and bonus and incentive-related compensation. While this study focuses on the effects of incentive-related compensation on risk-taking behaviors in the lodging industry, the possibility that cash compensation can also have effects is not precluded. As suggested in the literature, different compensation structures give managers different incentives. For instance, Bryan, Hwang, and Lilien (2000) suggest that stock options provide incentives for managers to make decisions that risk neutral shareholders prefer. In addition, equity-based compensation gives managers greater incentives to make value-maximizing decisions, thereby increasing risk-taking. Consequently, option-based executive compensation aligns CEOs' interests with shareholders by requiring executives to assume additional risk. On the other hand, as option-based executive compensation increases, the executive's personal portfolio becomes less diversified. As such, managers may make decisions that actually reduce firm risk in an attempt to diversify the risk of their personal portfolios. Based on the above, the study treats firm risk as a managerial choice. This implies firm risk is endogenous to other managerial decisions. The ideas just introduced suggest the following risk-taking versus risk-averse hypotheses. Testing the validity of the hypothesis is testing whether or not the incentive-based component of executive compensation has an effect on a firm's risk-taking. In other words, hypothesis H1 suggests that the risk taking associated with a firm increases with an increase in the CEO's stock option-based compensation.

H1: Option-based compensation for the CEO of a firm promotes risk-taking behavior.

To consider the endogenous relationship between managerial decisions related to risk and compensation requires examination of a two-way relationship. Since a firm faces a broad array of strategic choices, the simultaneity of these strategic choices has to be taken into account and the managerial choices should be jointly determined. This suggests equations as follows where risk-taking is a function of compensation structure and other firm characteristics variables, and on the other hand, compensation structure is a function of risk-taking along with other firm characteristics variables. The concept of an endogenous relation is shown

in equations 1A and 1B. As is pursued below in introducing analysis by three-stage least squares regression (3SLS), to be valid, regression models for relations involving endogenous variables is must correctly allow for the endogenous relationship.

Risk = f (compensation structure, firm characteristics variables)
Equation 1A

Compensation structure = f (risk, firm characteristics variables)
Equation 1B

H2 augments H1 by bringing in the information asymmetry hypotheses. The information asymmetry hypothesis refers to higher firm risk corresponding with higher information asymmetry. In practical terms, this relates to managers preferring incentive-based compensation to take advantage of private information. Therefore, information symmetry is tested for to investigate how a firm's risk level affects the design of compensation contracts. The information asymmetry hypothesis is H2.

H2: Executives perceiving themselves in firms facing high versus low-risk favor the use of incentive-based compensation.

METHOD AND DATA

Method

To pursue this research how some concepts are measured needs to be clearly defined. For example, the ratio of annual stock option-based compensation over total compensation is the measure used to capture the role of stock-option-based compensation in compensation plans. Market-based risk measures are employed in this study are based a model. The Capital Asset Pricing Model (CAPM) is expressed by Equation. As given the model generates market-based risk measures for each year based on daily stock return data. Such data can be obtained from the Center for Research in Security Prices (CRSP) database.

$$Rjt = \alpha + \beta mj\ (Rmt - Rft) + ujt, \qquad (2)$$

where Rj is the daily return on firm stock j,

Rm is the daily return on the CRSP equally-weighted index,

Rft is the daily three-month T-bill yield obtained from the Federal Reserve Bank of St. Louis, and uj is a random error term.

Estimation of Equation 1 results in the risk measure, βmj. As described in CAPM, βmj is a proxy for systematic risk. Furthermore, two additional risk measures are generated by calculating the standard deviation of the stock returns (σj) and the standard deviation of the residuals (σuj). As found in the literature cited, in estimating Equation 1, the standard deviation of daily stock returns (σj) is measuring the firm's

total risk. The standard deviation of the residuals (σuj) is defined as idiosyncratic risk. Given that executives are less diversified in stock holdings than shareholders of their company, reasoning suggests they are more concerned about total and idiosyncratic risk than systematic risk. Therefore, this research focuses on the relations between total risk, idiosyncratic risk, and option-based compensation.

As suggested above, risk-taking behaviors and option compensation structure design are considered as the two endogenous variables. Equation 3, the RISK equation is formulated to explicitly examine H1 The specification of the compensation (OPTION/TOTAL) equation (Equation 4) tests facilitates testing H2. The general rational for Equations 3A and 3B is that OPTION_TOTALi,t is lineally related to RISK subject to these variables influencing each other and some exogenous variables listed (and defined below) influencing RISK but not OPTION_TOTALi,t. For instance, a positive and significant □0, the coeff measure OPTION/TOTAL, would support the risk-taking hypothesis (H1). On the other hand, a negative and significant □0 coefficien support the risk-aversion hypothesis. Finally, an insignificant coefficient will be consistent with the risk-neutral argument; that is that executive's option-based compensation does not have any measurable impact on firms' risk-taking behavior. In a similar way Equation 4 is expressing that RISK is lineally related to OPTION_TOTALi,t subject to exogenous variables listed influencing OPTION_TOTALi,t but not RISK (table 1).

Table 1. Risk and compensation equation

PANEL A1			**PANEL A2**		
Risk Equation (Total Risk)			**Compensation Equation**		
Parameter	Estim.	t-Value	Parameter	Estim.	t-Value
Intercept	0.010	1.57	Intercept	-0.308	-2.64 ***
OPTION/TOTAL	0.045	10.40 ***	σ	14.865	12.49 ***
CASH	0.019	6.48 ***	CASH	-0.467	-13.72 ***
D_DUAL	-0.003	-2.22 **	D_DUAL	0.004	0.16
			MEETING	-0.001	-1.49
INTERLOCK	-0.007	-2.82 ***	INTERLOCK	0.113	2.15 **
Ln(TA)	-0.003	-7.24 ***	Ln(TA)	0.035	4.66 ***

CAPITAL_RATIO	-0.004	-2.92 ***			
			ROA	0.004	3.10 ***
GROWTH	0.000	4.23 ***	GROWTH	0.000	-3.27 ***
AGE	0.000	1.41	AGE	0.004	1.58

PANEL B: Idiosyncratic Risk Equation and Compensation Equation

PANEL B1			**PANEL B2**		
Risk Equation (Idiosyncratic Risk)			**Compensation Equation**		
Parameter	Estim.	t-Value	Parameter	Estim.	t-Value
Intercept	0.007	1.02	Intercept	-0.248	-2.14 **
OPTION/TOTAL	0.045	10.71 ***	σ_u	15.529	12.95 ***
CASH	0.020	6.76 ***	CASH	-0.469	-13.60 ***
D_DUAL	-0.004	-2.51 **	D_DUAL	0.016	0.60
			MEETING	-0.002	-2.04 **
INTERLOCK	-0.007	-2.76 ***	INTERLOCK	0.116	2.22 **
Ln(TA)	-0.003	-7.39 ***	Ln(TA)	0.038	5.03 ***
CAPITAL_RATIO	-0.003	-2.60 ***			
			ROA	0.004	3.38 ***
GROWTH	0.000	4.15 ***	GROWTH	0.000	-3.41 ***
AGE	0.000	1.59	AGE	0.002	1.02

αβγδ

OPTION_TOTALi,t=α0,1+α1,1TOTAL_RISKi,t+α2,1ROA+α3,1MEETING+α4,1D_DUAL+α5,1AGE+ α6,1LN_TA+α7,1GROWTH+α8,1CASH+α9,1INTERLOCK+ε,i,t (3)

TOTAL_RISKi,t =b1,0 +b1,1 × OPTION_TOTALi,t + b2,1 × CAPITAL_RATIO + b3,1 × D_DUAL + b4,1 × AGE + b5,1 × LN_TA+ b6,1 × GROWTH + b7,1 × CASH + b8,1 × INTERLOCK + εi,t (4)

OPTION_TOTALi,t=α0,2+α1,2TOTAL_RISKi,t+α2,2ROA+α3,2MEETING+α4,2D_DUAL+α5,2AGE+α6,2LN_TA+α7,2GROWTH+α8,2CASH+α9,2INTERLOCK+ε,i,t (3)

TOTAL_RISKi,t =d1,0 +d1,1 × OPTION_TOTALi,t + d2,1 × CAPITAL_RATIO + d3,1 × D_DUAL + d4,1 × AGE + d5,1 × LN_TA+ d6,1 × GROWTH + d7,1 × CASH + d8,1 × INTERLOCK + εi,t (5)

Where variables and parameters are specified below in Table 2.

Table 2. Variables, their description and summary justification for inclusion in equations

Variable or group of variables	Description	Justification
$TOTAL\_RISK_{i,t}$	$TOTAL\_RISK_{i,t}$ is the total risk of firm i at time j and is measured by σ_j, σ_{uj} is the idiosyncratic risk (standard deviation of residuals u_j from equation (1));	
$IDIOSYNCRATIC\_RISK_{,i,t}$	$IDIOSYNCRATIC\_RISK_{,i,t}$ is the idiosyncratic risk of firm i at time t and is the standard deviation of residuals u_j from equation (1)	
OPTION/TOTAL	The total value of annual stock options granted as a percentage of the total annual compensation of the CEO	
$a_{1,1}$ and $b_{1,1}$	are respectively regression coefficients of "TOTAL_RISK" and of "OPTION_TOTAL"	
$c_{1,1}$ and $d_{1,1}$	are respectively regression coefficients of "IDIOSYNCRATIC_RISK" and of "OPTION_TOTAL"	

LN_TA	As a measure of firm size, the natural logarithm of the total assets of the firm	Chen et al (2006)
CAPITAL_RATIO	As a measure of financial leverage, the capital-to-assets ratio (see e.g., reference/s),;	Chen et al (2006)
GROWTH	Three-year revenue growth rate from (t-2), (t-1) and t.	Chen et al (2006)
ROA	As a measure of firm performance and is the ratio of net income to total assets.	Chen et al (2006)
CASH	The total value of cash compensation as a percentage of the total annual compensation of the CEO;	Chen et al (2006)
MEETING	The number of board meetings held during the year t;	Conger, Finegold, & Lawler (1998) suggest that the effectiveness of the board can be improved by time in meetings. Vafeas (1999) finds that the frequency of board meetings increases only after poor firm performance.
D_DUAL	A dummy variable equal to 1 if the chief executive officer also holds the chairman title, otherwise 0;	the coefficient is expected to be negative in risk equation (Yermack (1996) and Core et al. (1999) find evidence that CEOs in dual roles creates agency problems the coefficient is expected to be negative in option equation (Brickley, Coles, & Jarrell (1997)
INTERLOCK	A dummy variable equals to 1 if interlock relationship exists, otherwise 0;	Chen et al (2006) The existence of an interlock relationship implies weak

		corporate governance mechanisms.
AGE	The present age of the CEO;	Tufano (1996) contends that the CEO's age serves as a proxy for age-related risk aversion.

In Table 2 statements about inclusion of variables are terse so some elaboration is appropriate. Having D_DUAL_allows examining whether an CEO also a chairman of the board has an impact on the firm's risk strategy. Yermack (1996) and Core et al. (1999) find evidence that CEOs in dual roles creates agency problems. If a CEO's dual role makes him/her less aligned with shareholders, the coefficient is expected to be negative. However, if the dual role reduces the importance of alternative incentive-alignment mechanisms as argued in Brickley, Coles, & Jarrell (1997), D_DUAL is expected to be negatively associated with option-based compensation. The variable INTERLOCK allows consideration of how a compensation committee interlock relationship of CEOs affects their risk-taking behaviors given that one (or more) of the following three interlock relationships exist (see Appendix 1). The existence of an interlock relationship implies weak corporate governance mechanisms under which the interests of such CEOs may diverge from those of shareholders, and so the coefficient for this variable is expected to be negative. if a CEO is more risk-averse or holds a less diversified portfolio, the CEO is more likely to prefer non-option based compensation structure. In this case a negative coefficient of INTERLOCK is expected. On the other hand, for a more risk-taking CEO, an option-based compensation structure is preferred and a positive coefficient is expected. The CEO's age (AGE) is introduced because Tufano (1996) contends that the CEO's age serves as a proxy for age-related risk aversion. Other variables one might like to consider (e.g., number of directors) are not in the analysis because the ExecuComp database used in this study determines variables used.) Jensen & Murphy, 1990; Ke et al., 2002) discuss the purpose of granting incentive compensation being to align the interest of shareholders and managers. Having , firm performance (ROA) allows examining if the expected positive relation exists with incentive compensation. MEETING is included since the effect of board meeting frequency on executive compensation is not a priori clear. Conger, Finegold, & Lawler (1998) suggest that the effectiveness of the board can be improved by time in meetings, so additional meetings serve to increase the alignment of

managerial and shareholder interest. Vafeas (1999) finds that the frequency of board meetings increases only after poor firm performance. Interpreting increased meetings as lowering firm value as a result of weak corporate governance reflects poor alignment of managerial and shareholders' interests.

Data

We collect data from three databases: CompuState, CRSP, and ExecuComp. To focus on the lodging industry, data falling under the SIC codes 7011, 6798 and 7990 are used (e.g., see Singh and Upneja 2008). SIC 7011 is for hotel/lodging firms. The code 6798 includes REIT firms and 7990 contains gaming firms. Compensation data for the lodging industry was extracted from Standard & Poor's ExecuComp, which contains: current cash compensation including salary and bonus, long-term cash incentive payouts, and options and restricted stock grants. The ExecuComp database also contains corporate governance and financial statement variables such as the sales growth rate, total assets, board meetings, CEO interlock relationship, and whether the CEO is also a chairman.

The sample covers a 14-year period extending from 1992 to 2005. Complete market returns and daily return for each firm were retrieved from the database of Center for Research in Security Prices (CRSP) and were merged with the executive compensation data. The final sample including all necessary data for the empirical analysis contains 3347 firm-CEO-year observations over the 14-year sample period 1992-2005. The data are for 98 distinct firms.

FINDINGS

Descriptive Statistics

Table 3 reports descriptive statistics of all of the variables used in this analysis. Some values provide insights. The corporate governance structure of the entire industry is reflected by, for example, the CEO-Chair dummy variable having a value of 0.10. This suggests that about 10% of CEOs also hold the position of Chairman of the board. The average number of board meetings each year is about 7 with a minimum of 3, and a maximum of 20. Scope exists for seeing an effect. On average 1% of firms' CEOs also serve on the compensation committees either in the companies where they are CEOs or in the companies where they serve on the boards. This percent is so small that finding a significant relation

would show a great influence of D_DUAL. Regarding the CEOs age, CEOs of the lodging industry have an average age of 55, median age of 54, and standard deviation of 9. Given about 15% are 45 or under and 15% are 65 or older, diversity in age is such that an effect could be detected.

Table 3. Descriptive Statistics

	Mean	Median	Std_Dev	Min	Max
σ	0.03	0.02	0.02	0.01	0.12
σ_u	0.02	0.01	0.01	0.01	0.11
β_m	1.03	0.98	0.62	0.03	3.89
OPTION/TOTAL	0.18	0.03	0.25	0.00	1.00
D_DUAL	0.10	0.00	0.31	0.00	1.00
MEETING	7.31	7.00	3.43	3.00	20.00
INTERLOCK	0.01	0.00	0.10	0.00	1.00
AGE	55.23	54.00	9.22	30.00	87.00
SIZE	7.96	8.04	1.13	3.28	10.17
CAPITAL_RATIO	0.40	0.39	0.16	0.00	0.94
ROA (%)	2.36	2.17	3.39	0.00	27.90
GROWTH (%)	27.49	9.14	12.35	-2.58	190.39

Key: This table reports the descriptive statistics for all variables used in the analysis. □ measures total risk; □u is the idi
OPTION/TOTAL is a ratio dividing options compensation by total compensation; D_DUAL =1 if CEO is also the Chairman of the board; 0 otherwise; MEETING is the frequency of board meetings; SIZE is firm size measured by the natural log of total assets; CAPITAL_RATIO is the ratio of capital to assets; ROA is return on asset defined as the ratio of net income to total asset; and GROWTH is the 3-year sales growth rate. AGE is the present age of the CEO. INTERLOCK = 1 if CEO interlock relationship exists. Interlock relationship indicates whether the named officer is involved in a relationship requiring disclosure in the "Compensation Committee Interlocks and Insider Participation" section of the proxy.

Table 4 shows various executive compensation components and the compensation structure over time from 1992 to 2005. Comparing all compensation components for the lodging industry, the option component increases from $286, 715 to $465, 322, representing a 3.80% annual growth rate. Bonuses increase from $156, 156 in 1992 to $512,399 in

2005, representing a 9.57% annual growth rate. Salary increases from $236,584 in 1992 to $407, 806 in 2005 – a 4.28% annual growth rate.

Table 4. Time-Series Data of Executive Compensation

YEAR	SALARY	BONUS	STOCK OPTIONS	TOTAL COMP	OPTIONS /TOTAL
1992	236.584	156.156	286.715	721.339	0.159
1993	221.572	182.583	452.666	1014.647	0.176
1994	301.222	125.018	755.348	1348.225	0.270
1995	309.096	141.193	694.435	1272.054	0.166
1996	275.445	105.880	1153.620	1656.201	0.395
1997	302.033	134.851	828.263	1634.925	0.345
1998	288.122	227.487	908.800	1764.159	0.274
1999	321.880	324.241	788.908	1614.351	0.331
2000	359.618	394.312	626.296	1711.741	0.226
2001	345.455	264.182	727.717	1782.522	0.209
2002	345.069	266.260	262.455	1398.790	0.133
2003	353.712	285.653	351.324	1426.189	0.127
2004	370.235	453.937	270.409	1722.808	0.091
2005	407.806	512.399	465.322	2582.199	0.113

Key: OPTIONS/TOTAL is calculated as the average of the options to total compensation ratios for all executives in a given year. All compensation levels are measured in $000.

Regression Method and Results

Regression for the equations given with endogenous variables can be done with either 2sls or 3sls. As suggested in Judge, Hill, Griffiths, Lütkepohl, & Lee (1988), 3SLS incorporates the information that is related to the error covariances and thus 3SLS estimation is asymptotically efficient, we implement 3SLS for parameter estimation..

Panel A1 of Table 5 gives estimation results for the set of equations (3) and (4) and Panel A1 of Table 5 gives estimation results for the set of equations (5) and (6). Each equation's model is jointly significant at the 1% level with the F values, 5.94 for the models of TOTAL_RISK and OPTION_TOTAL and 6.19 for the model of IDIOSYNCRATIC_RISK and OPTION_TOTAL.

The 3SLS results reported in Panels A1 and B1 show that the CEO's compensation structure (OPTION_TOTAL). Given the positive and statistically significant (1% level) value of the Option_total coefficient of in equations (3) and (5), results consistently suggest that as option-based compensation increases the firm's total and idiosyncratic risks also increase. Such results are consistent with the risk-taking (H1) stating that as the CEO's compensation is more option-based, the interests of executives and shareholders converge

Table 5. 3SLS Estimates for the Simultaneous Equation System of Risk and Compensation Structure

PANEL A: Total Risk Equation and Compensation Equation

PANEL A1			**PANEL A2**		
Risk Equation (Total Risk)			**Compensation Equation**		
Parameter	Estimate	t-Value	Parameter	Estimate	t-Value
Intercept	0.010	1.57	Intercept	-0.308	-2.64 ***
OPTION/TOTAL	0.045	10.40 ***	σ	14.865	12.49 ***
CASH	0.019	6.48 ***	CASH	-0.467	-13.72 ***
D_DUAL	-0.003	-2.22 **	D_DUAL	0.004	0.16
			MEETING	-0.001	-1.49
INTERLOCK	-0.007	-2.82 ***	INTERLOCK	0.113	2.15 **
Ln(TA)	-0.003	-7.24 ***	Ln(TA)	0.035	4.66 ***
CAPITAL_RATIO	-0.004	-2.92 ***			
			ROA	0.004	3.10 ***
GROWTH	0.000	4.23 ***	GROWTH	0.000	-3.27 ***
AGE	0.000	1.41	AGE	0.004	1.58

PANEL B: Idiosyncratic Risk Equation and Compensation Equation

PANEL B1			**PANEL B2**		
Risk Equation (Idiosyncratic Risk)			**Compensation Equation**		
Parameter	Estimate	t-Value	Parameter	Estimate	t-Value
Intercept	0.007	1.02	Intercept	-0.248	-2.14 **
OPTION/TOTAL	0.045	10.71 ***	σ_u	15.529	12.95 ***
CASH	0.020	6.76 ***	CASH	-0.469	-13.60 ***
D_DUAL	-0.004	-2.51 **	D_DUAL	0.016	0.60
			MEETING	-0.002	-2.04 **
INTERLOCK	-0.007	-2.76 ***	INTERLOCK	0.116	2.22 **
Ln(TA)	-0.003	-7.39 ***	Ln(TA)	0.038	5.03 ***
CAPITAL_RATIO	-0.003	-2.60 ***			
			ROA	0.004	3.38 ***
GROWTH	0.000	4.15 ***	GROWTH	0.000	-3.41 ***
AGE	0.000	1.59	AGE	0.002	1.02

Key: σ measures total risk; σu is the idiosyncratic risk; compensation structure is measured by OPTION/TOTAL, which is a ratio dividing options compensation by total compensation; CASH is a ratio of cash compensation to total compensation; D_DUAL =1 if

CEO is also the Chairman of the board; 0 otherwise; MEETING is the frequency of board meetings; Ln(TA) is the natural logarithm of total assets; CAPITAL_RATIO is the ratio of capital to assets; ROA is return on asset; and GROWTH is the 3-year sales growth rate. AGE is the present age of the CEO. INTERLOCK = 1 if CEO interlock relationship exists. Interlock relationship indicates whether the named officer is involved in a relationship requiring disclosure in the "Compensation Committee Interlocks and Insider Participation" section of the proxy.

Among the firm characteristic variables, firm size (LnTA) has negative and significant effects on risk-taking, whereas revenue growth significantly and positively affects risk-taking. The parameter estimate for the capital-to-assets ratio is negative and significant at the 1% level, consistent with the expectation that lower financial leverage has a negative influence on risk.

For the corporate governance variables, the dual role of the CEO (D_Dual) carries a negative sign and is significant in both risk equations, consistent with the arguments that a CEO's dual role makes him/her less aligned with shareholders (e.g., Core et al. 1999). CEO age (AGE) was not significant in this analysis.

The compensation equations of Panels A and B of Table 3 also present results of the impact of risk on compensation. As shown in Panel A2 and B2, both total risk and idiosyncratic risk are significant, positive factors in the compensation structure equation supporting the information asymmetry hypothesis (H2).

Among the firm characteristic variables, firm size (measured by total assets) is significant and positive indicating that larger firms use more option-based compensation; return on assets is significant and positive. For the corporate governance variables, the number of board meetings has no significant effect on compensation design while the endogenity is attributed to total-risk. On the other hand, corporate governance is significant (at the 5% level) and negative if the endogenity is attributed to idiosyncratic risk. This last finding is consistent with Vafeas (1999) wherein increasing board meeting frequencies occurred only after poor firm performance making option-based compensation less attractive. The CEO interlock relationship shows positive and significant effects on the use of option-based compensation. Other corporate governance variables, such as the dual role of Chairman/CEO, and CEO age do not affect compensation structure decisions. This result suggests that corporate governance structures are not effective in setting executive compensation in the lodging industry.

In summary, the findings from the simultaneous equation framework in which risk and compensation are endogenous and jointly estimated suggest that option-based compensation does induce a firm's

risk-taking. In addition, firm risk does appear to have an effect on the compensation contract design, a result that supports the information asymmetry H2.

DISCUSSION

This study investigates two issues regarding compensation structure and firm risk for the lodging industry. Specifically, the study examines whether a companies' option-based compensation induces risk-taking and whether the firm's risk determines the design of CEOs' compensation contracts. A simultaneous equation model of firm risk and option-based compensation was constructed and tested using the 3SLS method. Treating both firm risk and compensation structure as endogenous is justified because both variables are endogenously determined decision variables. Failing to estimate them in a simultaneous equation framework may result in simultaneity bias.

Results can be summarized as follows. The 3SLS results suggest that firm risk increases when the executive compensation contract is more option-based. Firm risk does impact executive compensation contract design, supporting the information asymmetry hypothesis. (3) Corporate governance variables are mostly significant in the risk-taking equation, but are not effective in setting executive compensation in the lodging industry.

The existing literature in lodging industry examines the effects of compensation on performance. This research contributes to the literature by extending this line of research to examining the effects of compensation on risks. In addition, this study contributes to the lodging literature by examining not only the effects of compensation structure on risk-taking, but also the endogenous effects of risks on compensation structure. Use this style for the next section of your paper, as well as for any subsequent sections. You may name the title as required, but make sure not to change the type of letters/fonts or the formatting of the paper.
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