

EXECUTIVE COMPENSATION: A MULTI-TASKING MODEL

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Abstract

This study develops a model of a multi-tasking executive whose behavior is motivated by the specific forms of compensation received. This model extends the theory of corporate finance in two significant ways: first, it examines risk-averse executive behavior in a multitasking environment, and, second, it yields a theoretical understanding of why one form of variable compensation provides different incentive than another. As a generalization, we find that option compensation is more effective than stock compensation in inducing the executive to take on investment risk, while the inverse is true for inducing the executive to issue debt or pay dividends.

Keywords: executive compensation, corporate governance, stock compensation

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Introduction

In a modern firm, equity holders have largely given up any role in the daily operations of the firm; instead, executives act as their agents and purportedly carry out their wishes through a wide range of activities. Equity holders, however, retain control over executives through compensation policy. This study develops a model of a multi-tasking executive whose behavior is motivated by the specific forms of compensation received. It investigates the effects of different forms compensation on risk-averse executive behavior in a multitasking environment in order to determine how different firm policies are motivated by different compensation structures.

The need for some form of variable incentive as part of an executive's compensation plan has been long understood, but there is a lack of models explaining why specific types of variable compensation are needed and what effects those different types will have on the behavior of executives.¹⁷ The difficulty is exacerbated by the many forms of variable compensation increasingly in use.¹⁸ Beyond a fixed salary, executives receive, among many other types, bonuses, stock options, premium-priced stock options, performance shares, performance units, restricted equity, phantom equity, dividend-based compensation, etc.¹⁹ If the labor

market for executive talent is well-functioning, there must exist some undisclosed need for this plethora of forms and means of compensating executives.²⁰ This study examines the use of two proto-typical forms of variable compensation, an equity position and stock options, as inducements for executives. The first section of the paper reviews the literature and isolates some flaws of earlier models. The second part section constructs a tractable, discrete time model of risk-averse executive behavior. The third section examines the implications of that model, and the fifth section concludes.

Two broad assumptions underpin the model. First, we assume that the firm operates in Berle and Means environment²¹, i.e., equity holders are individually well-diversified, and their numerous asset holdings make it inefficient for them either to devote a significant amount of time to an individual firm or to acquire the necessary firm-specific knowledge. Control is delegated to executives with specialized skills and knowledge who run the firm, but are themselves beholden to the equity holders for compensation. Specifically, we assume that equity holders delegate control over three policy areas: 1) investment policy—executives decide how the firm's resources are invested, 2) financing policy—executives decide how capital is acquired to fund those projects,

¹⁷Jackson and Lazear (1991), Choe (1999) and Nohel and Todd (2000) are a few exceptions.

¹⁸Yermack (1993) documents the dramatic increase in the use of variable compensation for managers, while Holderness, Kroszner and Sheehan show that executive ownership has also increased.

¹⁹For the full range and explanations of individual forms, see Smith and Watts (1982) or Murphy (1985).

²⁰It does not seem likely that these are perfect substitutes for each other; however, some researchers assume this: Hall (1998), for instance suggests that exchanging CEO's stock holdings with options would approximately double pay-to-performance sensitivity. Later we shall see that these two forms of compensation are optimal over different ranges of volatility, and we cannot assume that their characteristics and the behavior they engender are identical.

²¹Berle and Means (1932) and Fama and Jensen (1983).

and 3) payout policy—executives decide what level of dividends are distributed to equity holders; but, equity holders retain control over compensation policy—equity holders decide both the levels and forms of compensation given to executives.

Our second assumption concerns the risk preferences of these agents. Executives do not hold diversified portfolios, instead a significant portion of their total income is derived from the firm and their wealth is highly correlated with the value of the firm.²² Lacking a well-diversified portfolio, executives are highly risk-averse especially relative to equity holders (Amihud and Levi (1981)).²³

The Literature

The ‘multitasking’ problem arises when agents are required to perform multiple tasks that have complex interactions (see Crawford (1994), Feltham and Xie (1994), Holmström and Milgrom (1991), Prendergast (1999), and Sinclair-Desgagne (1999)). In this context, we jointly model the investment, financing and payout decisions²⁴ and observe the effects each form of compensation on executive multi-taking behavior.

While a number of studies indicate the need to offer variable compensation (for example, Antia and Mayer (1984) or Smith and Watts (1982, 1986)), few²⁵ explicitly characterize the optimal forms.²⁶ This study seeks to fill this gap by constructing a model that predicts the effects of different forms of compensation on executive and (consequently) firm behavior.

Risk-averse executives with fixed compensation are concerned with two liabilities: first, they themselves have a direct claim against the firm for their own future fixed compensation, and, second, since the cost of financial distress and bankruptcy would reduce future fixed compensation, executives are indirectly concerned with future liabilities to debt holders. Executives are concerned that firms retain sufficient wealth to cover both their own future claims and those of debt holders. Both of these induce the executive to reduce investment risk, debt level and dividend payouts in order to safeguard wealth for use

against these future liabilities.

The Investment Problem: Risk-averse executives have an incentive to lower asset risk to reduce firm volatility below that optimal for equity holders creating the problem of *under-investment*. A range of models have sought to describe executive risk-taking behavior and the effect upon it of differing compensation design;²⁷ Most have argued that executives have little opportunity to diversify their wealth portfolio (Heckerman (1975), Jensen and Meckling (1976), Smith and Stulz (1985), Lambert (1986), Hirshleifer and Suh (1992), Hermalin (1993), McConaughy and Mishra (1997), Gray and Cannella (1997), Murphy (1998)).²⁸ Executives can, however, have their compensation altered in such a way that their incentives will be aligned with those of equity holders. Some studies only recommend a generalized form of performance based compensation (e.g., McConaughy and Mishra (1997)), while others specifically model equity (e.g., Bizjak, Brickley and Coles (1993)) or option based compensation (e.g., Haugen and Senbet (1981), Green (1984), Hirshleifer and Suh (1992)). None of these, however, compare the efficacy of alternate forms of variable compensation in solving the under-investment problem.

The Financing Problem: Risk-averse executives also have an incentive to issue less debt than is optimal for equity holders creating the problem of *under-leveraging* (Ross (1977), Grossman and Hart (1982), Antia and Meyer (1984), Jensen (1986), Lang (1987), Firth (1995), Mehran (1992), Garvey and Hanka (n.d.)).²⁹ While the debt asset substitution problem has occupied much of scholars’ interest in capital structure,³⁰ a second and independent asset substitution problem occurs between managers and equity holders (the asset substitution problem occurs when incentives are not aligned and the agent has an incentive to undertake investments with different

²²See Coffee (1988) for the most developed exposition of the differing risk attitudes of managers and equity holders. There has been relatively little empirical study of the risk aversion of managers, but see Moers and Peek (2000).

²³This is further substantiated by studies showing that the level of executive compensation is higher in firms with more risk, see Per (1999).

²⁴As Holmström (1992) notes, the problem with executive action is not a lack of effort or ‘slacking’, as in other compensation scenarios, but the choosing between efforts toward self-gain rather than shareholder wealth.

²⁵We shall consider below the handful of studies that distinguish between different forms of compensation.

²⁶Some studies provide general observations about the advantages of one form of compensation over another, but none offers an explicit model.

²⁷The empirical results of these studies, as well as the empirical studies in this area, are reviewed later.

²⁸A parallel problem can be found in the actions of fund managers (Chevalier and Ellison (1999), Carpenter (1998)).

²⁹While managers have, in general, a motive to reduce debt, in the context of a takeover threat, they may have reason to increase debt in order to fend off that threat (Garvey and Hanka (n.d.)).

³⁰That is, equity holders have an incentive to shift to more risky assets once debt has been issued; the option-like characteristics of levered equity entails that the value of equity is increasing in the volatility of the underlying firm (and the value of debt decreasing). A conflict is created, since the risk of investment may not be fully observable (and thus not contractible by debt holders), and equity holders have the incentive to substitute riskier for less risky investments in order to extract wealth from debt holders once debt has been issued. Debt holders, of course, anticipate this shift, and they charge correspondingly higher rates—unless the equity holders have some mechanism to precommit to an investment policy of low risk.

characteristics than the principal, especially with regard to the risk of the investment). Like equity holders, managers also have incentives to shift asset risk—though in a direction opposite to that of equity holders. Managers receiving a fixed, expected compensation from the firm's cash flows would seek to reduce volatility below that optimal for equity holders. Managers have an interest in reducing the risk of the projects undertaken by the firm, since lower investment risk (or smaller investments in risky projects) will decrease the volatility of firm income. This creates the problem of underinvestment.

The Payout Problem: Finally, risk-averse executives have an incentive to lower dividend yield below that optimal for equity holders creating the problem of the *over-retention* of earnings (Smith and Watts (1982), Jensen and Smith (1985)). Unfortunately, the effect of equity holder-executive conflicts and compensation design on payout policy has been largely neglected. While some scholars have tested the empirical relationship³¹ (largely within the tradition of the pay-for-performance studies with dividends as a proxy for performance), theoretical models are scarce. One series of studies develops the notion (Easterbrook (1984)) of payout policy as a mechanism for reducing agency costs associated with external funding and as a substitute for executive ownership (Rozeff (1982), Crutchley and Hansen (1989), Schooley and Barney (1994), Chen and Steiner (1999)). Lambert, Lanen, and Larcker (1989) test the possibility that the use of option compensation would reduce dividends, while Fenn and Liang (1999) hypothesize the opposite effect for equity-based compensation. Chang (1993) and White (1996) approach the agency conflict over the payment of dividends themselves, and see dividend-based compensation as a means to force executives to pay them out (rather than mis-use the capital). While individual studies have considered each of these agency conflicts in isolation, none has addressed the multitasking question nor has any offered a rationale for choosing between different forms of variable compensation.

The Model for Executive Multi-Tasking and Compensation

Overview

Executives are delegated control over the investment, financing and payout policies of the firm and set these to maximize the utility of their own compensation. Executives are compensated through two contingent claims: option compensation, a European call upon the value of equity (contingent upon the terminal value of the equity); and, second, equity

compensation, a dividend cash flow and a capital gains cash flow.³² But to model the risk-averse executive, we must further introduce a non-linearity in the form of a utility function with the risk-averse characteristics described below. The value of compensation to the executive is the non-linear, discounted utility of these two contingent claims.

The approach will be to develop a discrete model using a binomial tree structure to represent the value processes of the firm and the securities valued upon it. Executives, under a given compensation structure, will choose the optimal corporate policies (from a discrete set of possibilities) maximizing their own utility.

The Firm

The firm begins with an initial equity endowment, and executives, by implementing different investment, financing and payout policies, may alter that value.

We assume that equity holders and debt holders are well diversified and operate in a complete market, so that we can endogenize the no arbitrage value of both

The Executive

The executive is risk-averse and the executive's utility function, $u(x)$, is twice differentiable, additive and time independent, i.e., a standard von Neumann-Morgenstein utility function.³³ We use a simple negative exponential utility function, $U(x) = -e^{-\beta x}$ satisfying the general conditions ($u' > 0$, $u'' < 0$) for a risk-averse utility function (when $\beta > 0$) with $\beta = 0.25$. As such the utility of executive compensation will be increasing in the value of compensation, but decreasing in the volatility of compensation. Further, executives acknowledge a time value to utility and discount future utility by their intertemporal discount rate of utility, r_u . Executives obtain all of their wealth from their investment of human capital in the firm. We assume that all executive cash flows are consumed, and that executives do not save, do not hold independent portfolios and cannot hedge the risk of variable compensation.³⁴

Executive Compensation

While there is, in practice, a great range of forms of variable compensation, we consider the two most common. First, executives may receive compensation in the form of equity participation in the firm modeled

³¹We shall consider these and their consistency with the results of this study below.

³² Equity compensation may be regarded as a contingent claim since it is contingent upon the firm being solvent.

³³This environment is an application of the more general model developed in Mirrlees (1976), Holmström (1979), and Grossman and Hart (1983).

³⁴Ofek and Yermack (1999) show that managers may 'unwind' positions if they have and sell shares which they already own.

as a restricted equity plan. That is, conditional upon the solvency of the firm, executives receive dividends cash flows throughout their employment, but only obtain the share value at the terminal date. Second, executives may receive stock options in the form of European call options that can be exercised only at the termination date.³⁵

The option and equity compensation is initially expressed as a proportion of unlevered firm value: thus, a 1% equity position is a restricted equity grant equal to 1% of the value of the unlevered firm, and a 2% option position is a European call on 2% of the value of the unlevered firm with an exercise price equal to the initial value of the firm and an expiration date equal to the terminal period. After the compensation is awarded, executives select the capital structure maximizing utility. Since the grant of an equity stake to executives is restricted and the options cannot be exercised early, we assume that executives neither participate in the equity repurchase nor exercise options prior to the terminal date, and their equity and option proportions are adjusted for any change in the leverage of the firm.

Executive Objective Function and Choice Variables

Executives have discrete choice variables corresponding to the areas of corporate policy under their sway, i.e., investment, financing and payout policies: they may choose the investment volatility by choosing the standard deviation of aggregate investment risk;³⁶ they may choose the level of debt by determining the coupon paid to debt holders;³⁷ and they may choose the payout to equity holders in the form of the dividend yield. The objective function of the executive is to set the optimal investment, financing and dividend policies that maximize their personal utility.

Model Structure

We construct (for a given set of parameters) a binomial tree of the price paths of the unlevered firm. At each node, we can then price equity using the Leland equity formula to obtain a binomial tree of levered equity values (Leland (1994)). The utility received by the executive at each node is the value of the utility function for the total compensation received at that node. Since there is a time value to utility, executives discount the utility at each node by the intertemporal discount rate of utility. Utility is assumed to be independent and additive, so the

³⁵ These characteristics are consistent with what managers typically receive (Murphy (1998)).

³⁶ Note that the scale of the investment remains constant, i.e., a change in capital structure is accomplished by issuing debt and repurchasing equity.

³⁷ The Leland (1994) framework models the debt level as a function of the coupon paid.

aggregate utility of a compensation structure is the sum of the weighted³⁸ discounted utility at each node. We utilize a grid search to find the corporate policies that maximize executive utility for a specified compensation structure.

To explore the implications of this model we use a benchmark set of parameters:³⁹ The firm's initial equity endowment is \$1,000.00. The risk free rate of interest is assumed to be 5% and the corporate marginal tax rate 40%; the former is a typical value for that rate over a long-term economic horizon, later approximates the marginal tax rate for a large corporation. Following general practice (Murphy 1998), option compensation is awarded at-the-money, and it has a five year expiration date. The cost of bankruptcy is 10%.

Implications of the Model

While the goal of our study is to examine the implications of compensation structure in a multi-tasking environment, it is worth briefly considering the simpler cases. We begin by examining the effects of the two forms of variable compensation in three cases; namely, those in which the executive has control over only *one* of the three choice variables (investment, debt and dividend), while the other two are exogenous and constant.

In each figure below, the surface depicts the optimal selection of one choice variable by an executive maximizing personal utility over the possible combinations of option and equity compensation, i.e., each surface consists of points returned by the grid search. The range of equity compensation is allowed to vary from zero to 2%, while the option compensation may vary up to 3%.⁴⁰ Thus the origin, in the foreground, depicts the executive's choice when they have no compensation. The left section of the surface is the region with relatively more equity compensation and the right with relatively more option compensation.

The Single-Tasking Case: Investment Policy

As we would expect, since the value of options are increasing in the volatility of the underlying security, it is option compensation that is most compellingly induces more risky investment, and an increase of

³⁸For simplicity, we use the pseudo probabilities as weights.

³⁹ While many typical values are used in the benchmark, this is not to imply that the model is in any way 'calibrated' to real market conditions.

⁴⁰ It must be recalled that these values reflect the compensation percentage before the executive employs any leverage. After debt is issued the percentages and consequent compensation and utility are adjusted to compensate for changes in leverage.

investment risk is most normally to be associated with option compensation.

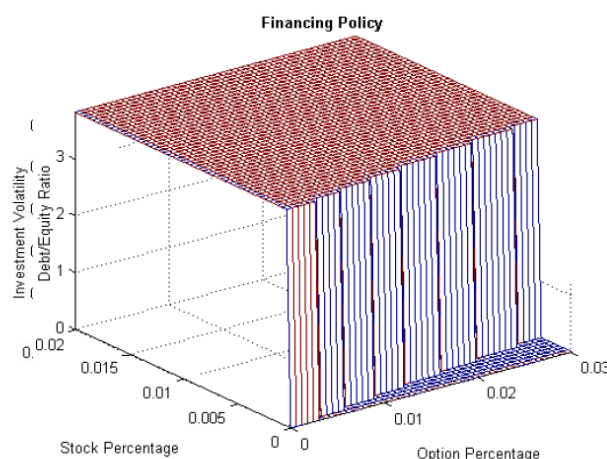


Figure 2. Financing policy when the on executive choice variable is the debt level.

The Single-Tasking Cases: Financing Policy and Payout Policy

By contrast, stock compensation motivates both the issues of debt and dividends. The executive will take advantage of the tax subsidy for debt over almost any combination of equity and option combination, so long as there is at least some significant equity component in that mixture.

Only in the case of solely option compensation, the executive will not issue debt.

A similar relationship occurs with payout policy. The payment of a dividend provides no additional cash flow to an executive compensated with almost exclusively option compensation, and the payment of a dividend both decreases the value of the stock and increases the expectation of bankruptcy, and, consequently, the executive's options on that stock.

Increases in both debt level and dividend payments are normally to be associated with option compensation.

The Double-Tasking Case: Financing and Payout Policies

While there are three possible scenarios in which the executive has control over two of the three corporate policies, i.e., investment policy and financing policy, investment policy and payout policy, and financing policy and payout policy, only the last is of interest. In the first two, option compensation influences the executive to raise the level of investment risk, while stock compensation influences the executive either to raise debt or to issue dividends. The case of financing policy and payout policy is more interesting, since both of these were, in the single-tasking cases, motivated by stock compensation.

The behavior of the executive can be described

in terms of three 'regions' over the policy surfaces:

- I. When there is almost exclusively option compensation, the executive neither issues debt nor pays a dividend.
- II. When the compensation mixture is most heavily dominated by stock compensation the executive both issues debt and pays dividends. But, while the maximum dividend is paid, the maximum level of debt is *not* issued.

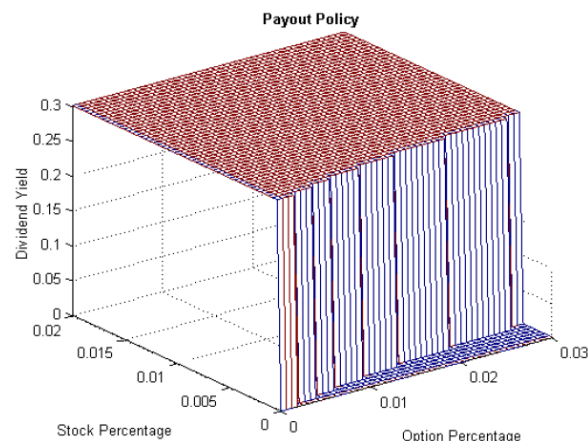


Figure 3. Payout policy when the on executive choice variable is dividend yield.

- III. When there is a significant amount of both stock and option compensation, but option compensation dominates, the executive issue the maximum level of debt, but does not pay a dividend.

Region I is explained for the reasons noted above (0); that is, these actions do not benefit the executive with almost exclusive option compensation.

The other two regions (II and III) imply that the use of debt versus dividend payment presents a trade-off for the executive, though not one that is wholly exclusive. In paying a dividend, the value of the firm declines—thus, decreasing the amount of debt that can be issued. Inversely, issuing debt (since in our model debt is substituted for equity) decreases the possible dividend. The interesting implication of this model is that, in this trade-off, option compensation is more effective in motivating the executive to issue debt, than is stock compensation. This makes intuitive sense, since option compensation is strictly decreasing in the dividend payment, but not in the debt level.⁴¹

⁴¹ Recall that a change in capital structure is accomplished by issuing debt and repurchasing equity, and that the executive's compensation percentages are adjusted to reflect the fact that they do not participate in the equity repurchase.

When stock compensation predominates, executives select the maximum dividend; when option compensation dominates the dividend is reduced and is strictly below that maximum. Dividends have contrasting effects on the compensation cash flows to executives: first, dividends are beneficial in that they allow executives with stock compensation to receive cash flows prior to the terminal period. By decreasing the duration of compensation cash flows, they increase the executive's utility. Second, however, the

compensation, the advantages of dividends predominate over those of debt: executives increase the utility of their compensation more through the payment of dividends, since dividends are fixed cash flows accruing over the life of the compensation structure, and suffer relatively small harm from the increased cost of financial distress. By contrast, with option compensation, there is no advantage to the payment of dividends, and the loss is two-fold: first, there are the costs of financial distress, but, even when the firm remains solvent, the payment of a dividend decreases the probability that the option will be as far in-the-money at expiration. Thus, when the option component of compensation dominates the equity component, the payout ratio is decreased. When option compensation is sufficiently high there is a payout incentive cost.

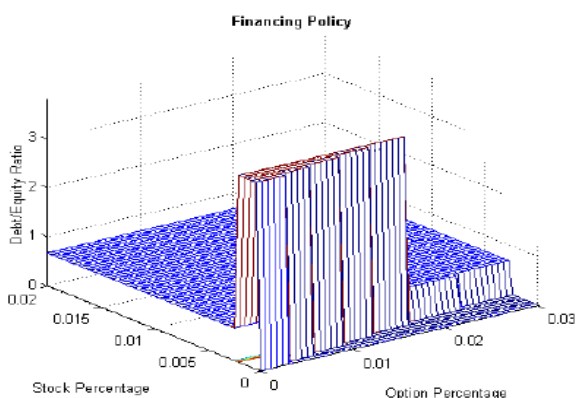


Figure 4. Financing policy when the on executive choice variables are debt level and dividend yield.

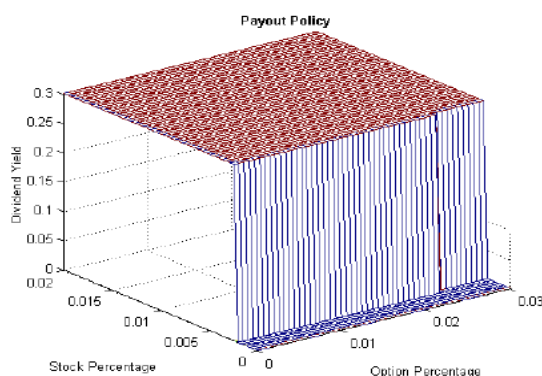


Figure 5. Payout policy when the on executive choice variables are debt level and dividend yield.

payment of dividends decreases firm value and increases the probability of financial distress. Since bankruptcy is costly, this effect decreases the value of both option and equity compensation. With stock

The Multi-Tasking Case: Investment, Financing and Payout Policies

Finally, we consider the full multi-tasking case, where the executive has control over all three firm policies: investment, financing and payout.

Since this is the central result of the study and

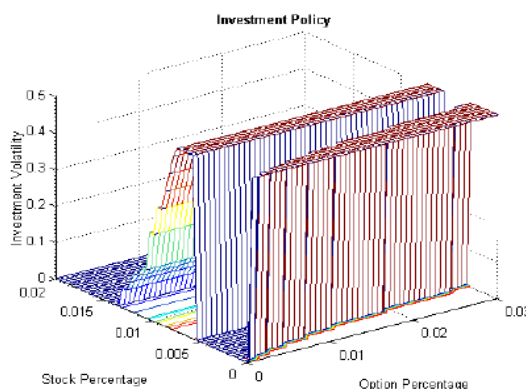


Figure 6. Investment policy when the on executive choice variables are volatility of investment, debt level and dividend yield.

the interactions are complicated, we will discuss each region in some detail. Essential to understanding these results is the risk-averse attitude of the executive. While implementing any of the policies *may* increase compensation and utility, *any* implementation will increase risk. As we place more policies under the control of the executive, we intensify the risk-return trade-offs and the likelihood that one or more policies will not be implemented.

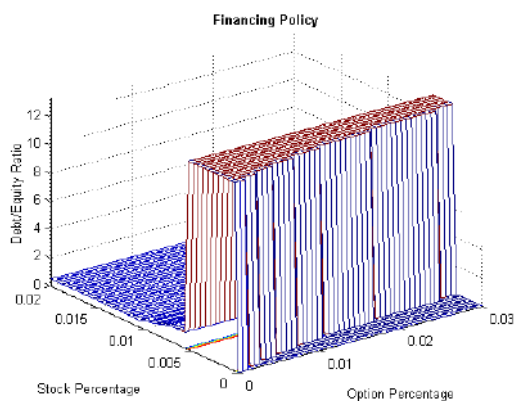


Figure 7. Financing policy when the on executive choice variables are volatility of investment, debt level and dividend yield.

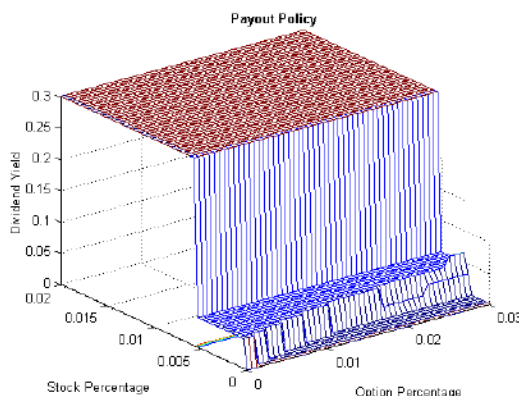


Figure 8. Payout policy when the on executive choice variables are volatility of investment, debt level and dividend yield.

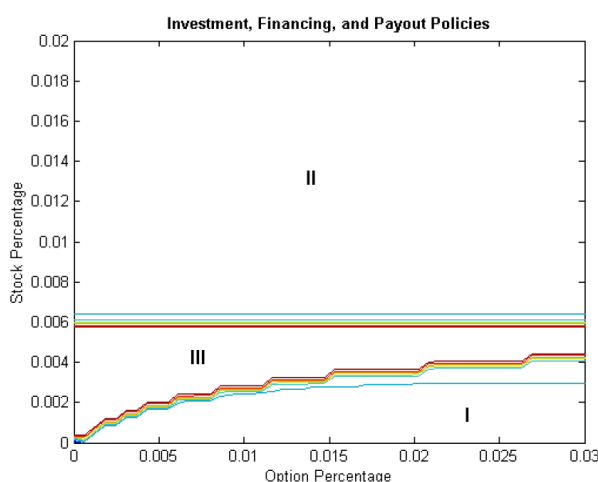


Figure 9. Contour map of investment, financing and payout policies

The curvature of the utility function captures the declining marginal utility of income and places a practical ceiling on the amount of risk that the executive will bear. The executive must choose among the various policies those that will maximize utility

(given the specific compensation mixture). Again, we can distinguish a series of ‘regions’ over the policy surfaces:

I: When there is almost exclusively option compensation, the firm neither issues debt nor pays a dividend, since (as we have considered above (0)) neither of these policies increases the utility derived from option compensation.

II: As discussed above (0), high levels of stock compensation not only induce the executive to restrict investment risk, but also cause them to select paying dividends over issuing debt when they are mutually exclusive due to the excess risk that employing both policies would engender.

III: The increase in stock compensation over Region I shifts the executive from increasing investment risk to issuing debt and paying dividends. Since debt increases the utility from option compensation more than do dividends (0), the presence of significant option compensation causes the executive to favor the maximum level of debt over that of dividends.

While the connections between compensation structure and firm policies is complex, we can see how the policies implemented by the executive vary over the policy surface in response to two factors: First, the differing incentives of stock versus option compensation, and, second, the limitations placed on the executive’s choices by the ‘risk ceiling’ imposed by a risk-averse utility function.

Conclusion

We know there needs to be a variable component to executive compensation, but a ‘multitasking’ problem arises when agents are required to perform multiple tasks that have complex interactions. We have assumed that equity holders delegate control over three policy areas: 1) investment policy—executives decide how the firm’s resources are invested, 2) financing policy—executives decide how capital is acquired to fund those projects, and 3) payout policy—executives decide what level of dividends are distributed to equity holders. Thus, the decision for equity holders is how to structure compensation so that executives will establish investment, financing and payout policies that are optimal for equity holders.

This model extends the theory of corporate finance in two significant ways: first, it examines risk-averse executive behavior in a multitasking environment, and, second, it yields a theoretical understanding of why one form of variable compensation is preferable to another. *Ceteris paribus*, we can say that, option compensation is more effective than stock compensation in motivating the executive to increase investment risk, while the inverse is true for motivating the executive to issue

debt or pay dividends. Within the trade-off between issuing debt and paying dividends (given that a certain level of stock compensation is present), option compensation motivates the executive to issue debt more than pay dividends. In the single-tasking cases, the model suggests that, in most cases, some option compensation is necessary to stimulate the executive to make any increase in investment risk, while some stock compensation is necessary to stimulate the executive to issue any debt or pay any dividend.

References

1. Amihud, Yakov and Baruch Lev (1981). "Risk Reduction as a Executive Motive for Conglomerate Mergers." *Bell Journal of Economics* 12: 605-617.
2. Antia, Murad J. and Richard L. Meyer (1984). "The Growth Optimal Capital Structure: Manager versus Shareholder Objectives." *Journal of Financial Research* 7: 259-267.
3. Berle, Adolf A. and Gardiner C. Means (1932). *The Modern Corporation and Private Property*. New York.
4. Bizjak, John M., James A. Brickley, and Jeffery L. Coles (1993). "Stock-Based Incentive Compensation and Investment Behavior." *Journal of Accounting and Economics* 16: 349-372
5. Campbell, David E. (1995). *Incentives: Motivation and the Economics of Information*. Cambridge.
6. Carpenter, Jennifer N. (1998). "The Optimal Dynamic Investment Policy for a Fund Manager Compensated with an Incentive Fee." Working Paper, New York University.
7. Chang, Chun (1993). "Payout Policy, Capital Structure, and Compensation Contracts When Managers Value Control." *Review of Financial Studies* 6: 911-933
8. Chen, Carl R. and Thomas L. Steiner (1999). "Executive Ownership and Agency Conflicts: A Nonlinear Simultaneous Equation Analysis of Executive Ownership, Risk Taking, Debt Policy and Dividend Policy." *Financial Review* 34: 119-136.
9. Chevalier, Judith and Glenn Ellison (1999). "Career Concerns of Mutual Fund Managers." *Quarterly Journal of Economics* 104: 389-432.
10. Choe, Chongwoo (1999). "Executive Stock Options and Investment Choice." Working Paper, La Trobe University.
11. Coffee, John C. (1988). "Shareholders versus Manager: The Strain in the Corporate Web." In John C. Coffee, Louis Lowenstein, and Susan Rose-Ackerman, eds. *Knights, Raiders, and Targets: The Impact of the Hostile Takeover*. Oxford, pp. 77-134.
12. Cotter, James F. and Kenneth J. Martin (1999). "Do Top Executives Under-Estimate the Value of Their Stock Option Compensation?" Working Paper, New Mexico State University.
13. Crawford, Gordon W. (1994). "Multi-Task Models of Agency: Functional Forms, Applications, and Empirical Testing." Working Paper, University of Rochester.
14. Crutchley, Claire E. and Robert S. Hansen (1989). "A Test of the Executive Theory of Ownership, Corporate Leverage and Corporate Dividends." *Financial Management* 18 (Winter): 36-46.
15. Easterbrook, Frank H. (1984). "Two Agency-Cost Explanations of Dividends." *American Economic Review* 74: 650-659.
16. Fama, Eugene F. and Michael C. Jensen (1983). "Agency Problems and Residual Claims." *Journal of Law and Economics* 26: 327-349.
17. Feltham, Gerald A. and Jim Xie (1994). Performance Measure Congruity and Diversity in Multi-Task Principal/Agent Relations." *Accounting Review* 69: 429-453.
18. Fenn, George W. and Nellie Liang (1999). "Corporate Payout Policy and Executive Stock Incentives." Working Paper, Federal Reserve.
19. Firth, Michael (1995). "The Impact of Institutional Stockholders and Executive Interests on the Capital Structure of Firms." *Executive and Decision Economics* 16: 167-175.
20. Garvey, Gerald T. and Gordon Hanka (n.d.). "The Management of Corporate Capital Structure: Theory and Evidence." Working Paper, University of British Columbia.
21. Gray, Samuel R. and Albert A. Cannella (1997). "The Role of Risk in Executive Compensation." *Journal of Management* 23: 517-540.
22. Green, Richard C. (1984). "Investment Incentives, Debt, and Warrants." *Journal of Financial Economics* 13: 115-136.
23. Grossman, Sanford J. and Oliver D. Hart (1982). "Corporate Financial Structure and Executive Incentives." In *The Economics of Information and Uncertainty*, ed. John J. McCall. Chicago, pp. 107-140.
24. Hall, Brian J. (1998). "The Pay to Performance Incentives of Executive Stock Options." Working Paper, Harvard University.
25. Hall, Brian J. and Kevin J. Murphy (2000). "Stock Options for Undiversified Executives." Working Paper, Harvard University.
26. Haugen, Robert A. and Lemma W. Senbet (1981). "Resolving the Agency Problems of External Capital Through Stock Options." *The Journal of Finance* 36: 629-647.
27. Heckerman, Donald G. (1975). "Motivating Managers to Make Investment Decisions." *Journal of Financial Economics* 2: 273-292.
28. Hermalin, Benjamin E. (1993). "Executive Preferences Toward Risky Behavior." *The Journal of Law, Economics and Organization* 9: 127-136.
29. Himmelberg, Charles P. and R. Glenn Hubbard (2000). "Incentive Pay and the Market for CEOs: An Analysis of Pay-for-Performance Sensitivity." Working Paper, Columbia University.
30. Hirshleifer, David and Yoon Suh (1992). "Risk, Executive Effort, and Project Choice." *Journal of*

- Financial Intermediation* 2: 308-345.
31. Holderness, Clifford G., Randall S. Kroszner, and Dennis P. Sheehan (1999). "Were the Good Old Days That Good? Changes in Executive Stock Ownership Since the Great Depression." *The Journal of Finance* 54: 435-470.
 32. Holmström, Bengt R. (1979). "Moral Hazard and Observability." *Bell Journal of Economics* 10: 74-91.
 33. Holmström, Bengt R. (1992). "Contacts and the Market for Executives: A Comment." In Lars Wein and Hans Wijkander, eds. *Contract Economics*. Oxford.
 34. Holmström, Bengt R. and Paul R. Milgrom (1991). "Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design." *The Journal of Law, Economics and Organization* 7: 24-52.
 35. Jackson, Matthew and Edward P. Lazear (1991). "Stock, Options, and Deferred Compensation." In Ronald G. Ehrenberg, ed. *Research in Labor Economics*, vol. 12, Greenwich, CT, pp. 41-62.
 36. Jensen, Michael C. (1986). "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review* 76: 659-665.
 37. Jensen, Michael C. and Clifford W. Smith, Jr. (1985). "Stockholder, Manager, and Creditor Interests: Applications of Agency Theory." In Edward I. Altman and Marti G. Subrahmanyam, eds. *Recent Advances in Corporate Finance*. Homewood, IL, pp. 93-131.
 38. Jensen, Michael C. and William H. Meckling (1976). "Theory of the Firm: Executive Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics* 3: 305-360.
 39. John, Teresa A. and Kose John (1993). "Top-Management Compensation and Capital Structure." *The Journal of Finance* 48: 949-974.
 40. Kole, Stacey R. (1997). "The Complexity of Compensation Contracts." *Journal of Financial Economics* 43: 79-104.
 41. Lambert, Richard A. (1986). "Executive Effort and Selection of Risky Projects." *Rand Journal of Economics* 17: 77-88.
 42. Lambert, Richard A., David F. Larcker, and R. Verrecchia (1991). "Portfolio Considerations in Valuing Executive-Compensation." *Journal of Accounting Research* 29: 129-149.
 43. Lambert, Richard A., William N. Lanen and David F. Larcker (1989). "Executive Stock Options Plans and Corporate Dividend Policy." *Journal of Financial and Quantitative Analysis* 24: 409-425.
 44. Lang, Larry H. P. (1987). "Executive Incentives and Capital Structure: A Geometric Note." Working Paper, University of Pennsylvania.
 45. Leland, Hayne E. (1994). "Corporate Debt Value, Bond Covenants, and Optimal Capital Structure." *The Journal of Finance* 49: 1213-1252.
 46. McConaughy, Daniel L. and Chandra S. Mishra (1997). "The Role of Performance-Based Compensation in Reducing the Underinvestment Problem." *Quarterly Journal of Business and Economics* 36.4: 25-37.
 47. Mehran, Hamid (1992). "Executive Incentive Plans, Corporate Control, and Capital Structure." *Journal of Financial and Quantitative Analysis* 27: 539-560.
 48. Meulbroek, Lisa K. (2000). "The Efficiency of Equity-Linked Compensation: Understanding the Full Cost of Awarding Executive Stock Options." Working Paper, Harvard University.
 49. Miller, Merton H. and Franco Modigliani (1961). "Dividend Policy, Growth, and the Valuation of Shares." *The Journal of Business* 34: 411-433
 50. Mirrlees, James (1976). "The Optimal Structure of Incentives and Authority within an Organization." *Bell Journal of Economics* 7: 105-131.
 51. Moers, Frank and Erik Peek (2000). "Executive Risk Aversion and Executive Compensation: Measurement Issues and an Empirical Test." Working Paper, Maastricht University.
 52. Murphy, Kevin James (1998). "Executive Compensation." Working Paper, University of Southern California.
 53. Nohel, Tom and Steven Todd (2000). "Executive Compensation, Executive Risk Aversion, and the Choice of Risky Projects." Working Paper, Loyola University, Chicago.
 54. Ofek, Eli and David L. Yermack (1999). "Taking Stock: Does Equity-Based Compensation Increase Managers' Ownership?" Working Paper, New York University.
 55. Per, Obeua (1999). "The Relationship Between Research and Development Expenditure and Executive Compensation in High-Technology Industries." *Executive Finance* 25.9: 55-67.
 56. Prendergast, Canice (1999). "The Provision of Incentives in Firms." *Journal of Economic Literature* 37.1: 7-63.
 57. Ross, Stephen A. (1973). "The Economic Theory of Agency: The Principal's Problem." *American Economic Review* 63: 134-139.
 58. Ross, Stephen A. (1977). "The Determination of Financial Structure: The Incentive-Signalling Approach." *Bell Journal of Economics* 8: 23-40.
 59. Rozeff, Michael S. (1982). "Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios." *Journal of Financial Research* 5: 249-259.
 60. Schooley, Diane K. and L. Dwayne Barney (1994). "Using Dividend Policy and Executive Ownership to Reduce Agency Costs." *Journal of Financial Research* 17: 363-373.
 61. Sinclair-Desgagne, Bernard (1999). "How to Restore Higher-Powered Incentives in Multitask Agencies." *Journal of Law, Economics, and Organization* 15: 418-433.
 62. Smith, Clifford W. and René M. Stulz (1985). "The Determinants of Firms' Hedging Policies." *Journal of Financial and Quantitative Analysis* 20: 391-405.
 63. Smith, Clifford W. and Ross L. Watts (1982). "Incentive and Tax Effects of Executive Compensation

- Plans.” *Australian Journal of Management* 7: 139-157.
64. Smith, Clifford W. and Ross L. Watts (1992). “The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies.” *Journal of Financial Economics* 32: 263-292.
65. White, Lourdes Ferreira (1996). “Executive Compensation and Dividend Policy.” *Journal of Corporate Finance* 2: 335-358.
66. Yermack, David L. (1993). “Trends in Executive Compensation in Large U. S. Firms Throughout the 20th Century.” Working Paper, Harvard University.