

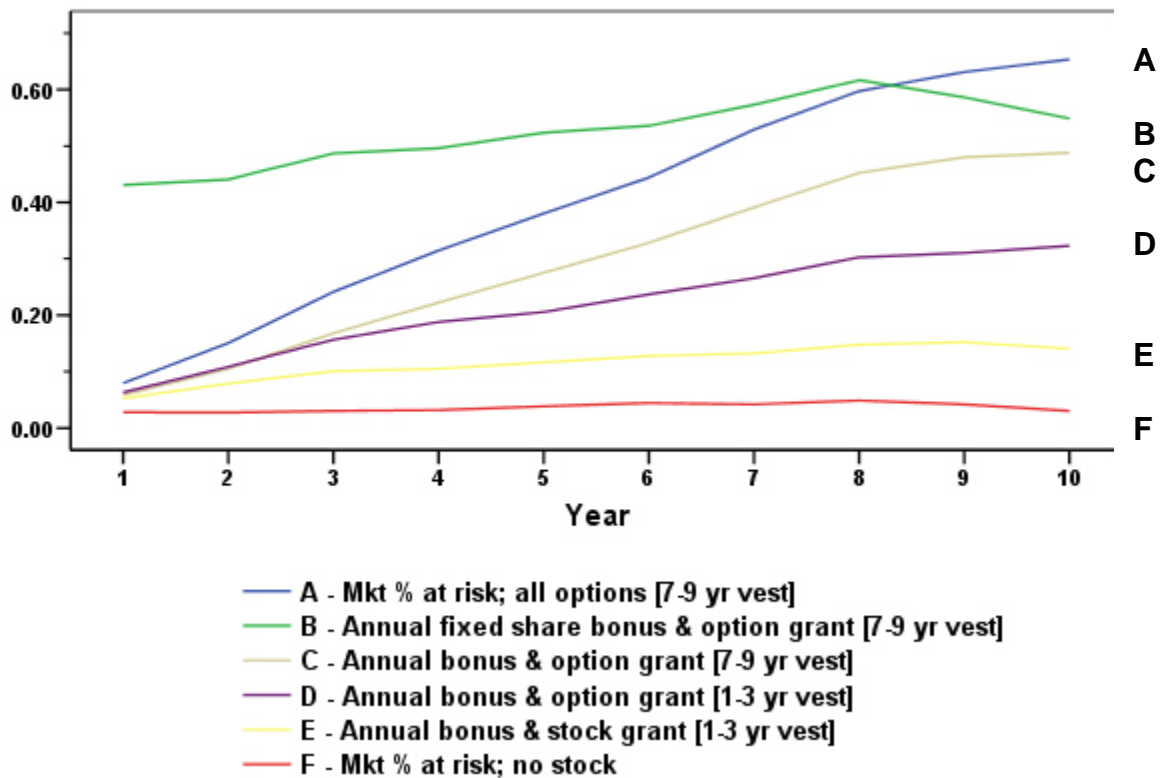
Monte Carlo Simulation Provides A Vivid Picture Of  
The Issues Facing Compensation Committees

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Compensation committees must answer four difficult questions:

1. Should compensation *opportunity* be tied to *past* performance? Or should target compensation levels be independent of past performance, e.g., 50<sup>th</sup> percentile pay policy regardless of past performance?
2. What is a meaningful way to measure the strength of management's incentive to increase shareholder wealth? Percent of pay at risk or "wealth leverage"?
3. What elements of pay or wealth will be used to give management a strong incentive to increase shareholder wealth? If the answer to question #1 is "no", expected future compensation provides *no* incentive (because it's independent of performance), and hence, management's incentive must come from current year pay and stock & option holdings.
4. What level of incentive is cost-efficient?

## Wealth Leverage vs. Time



**Wealth leverage** is the ratio of percent change in executive wealth to percent change in shareholder wealth. Executive wealth is stock & option holdings plus the present value

of expected future compensation. Wealth leverage of 0.4 means that a 10% change in shareholder wealth results in a 4% change in executive wealth. The graph is based on a Monte Carlo simulation of 500 ten year future performance scenarios for a large retailing company CEO with a market average mix of salary (20%), annual bonus (21%) and stock/option compensation (59%).

The graph above shows that:

1. The decision to make compensation opportunity independent of past performance, e.g., to pay at the 50<sup>th</sup> percentile regardless of past performance, greatly reduces management wealth leverage (line B vs. E in year 1).
2. A high percent of pay at risk, with no deferred stock compensation and a competitive pay policy, provides a very weak incentive (line F).
3. The weak incentive created by a competitive pay policy can be overcome, in time, by the accumulation of stock and option holdings (lines A & C).
4. The impact of holdings increases with more leveraged securities (D vs. E), longer holding periods (C vs. D) and a higher percent of incentive pay in stock or option compensation (A vs. C).

**Compensation committees must decide whether to tie compensation opportunity to past performance.** Denominating stock or option compensation in shares, e.g., an annual option on 50,000 shares, ties compensation opportunity to past performance and creates a much stronger incentive than a competitive grant policy that guarantees a target dollar grant value regardless of past performance. A fixed share grant policy means that poor stock performance reduces the value of future grants and good stock performance increases the value of future grants. When a fixed share policy results in below market pay, making an exception to the policy requires a compensation committee judgment that poor performance is not due to management. Many compensation committees are reluctant to adopt a fixed share pay policy – even though it provides a strong incentive – because it forces them to make difficult judgments about management’s contribution to value.

**The proper measure of incentive strength is “wealth leverage” not percent of pay at risk.** Executives, like investors, are motivated by prospective changes in their wealth. Percent of pay at risk is a poor proxy for wealth leverage because pay programs with the same percent of pay at risk provide very different levels of wealth leverage. Pay programs A, C, D, E and F all have the same percent of pay at risk every year, but provide very different levels of wealth leverage over time. Pay program B has the same initial percent of pay at risk, but immediately provides much higher wealth leverage than the other pay programs.

**Compensation committees must decide what elements of pay or wealth will be used to create strong incentives for top management to increase shareholder wealth.** An executive’s wealth has three basic components: stock & option holdings, current year pay and the present value of expected future compensation. Stock & option holdings are very sensitive to changes in shareholder wealth. A 10% change in shareholder wealth changes the value of the stock by 10% and the value of an option by 15% or more. But current year pay is poorly correlated with shareholder return (based on many empirical studies) and the present value of expected future compensation is totally uncorrelated with shareholder return (for companies with a competitive pay policy), so an executive’s “wealth leverage” will depend largely on the incentive contribution of stock & option holdings.

Current year pay is poorly correlated with shareholder return for two reasons. Pay programs are commonly designed to make current year pay as a percent of target sensitive to company performance. But since target pay levels are not adjusted for performance, most pay programs do not achieve a high correlation between year to year pay changes and performance. Suppose, for example, that the stock price declines by 20%, but target compensation increases by 10% over the prior year. If the company pays 91% of target, pay will increase over the prior year even though the stock price has declined by 20%. The second reason that current year pay is poorly correlated with shareholder return is that bonus and stock compensation decisions are strongly influenced by competitive pay considerations.

Our research shows that top management at the median S&P 1500 company has a significant incentive to increase shareholder wealth, but also shows that almost all of the incentive comes from stock and option holdings. At the median company, a 10% change in shareholder wealth changes top management wealth by 4%. However, almost all of this incentive comes from stock and option holdings. Holdings, which make up only 25% of median executive wealth, change by 15%, while the present value of expected future pay, which makes up 75% of median executive wealth, changes by less than 1%. (See Stephen F. O'Byrne and S. David Young, "Why Executive Pay Is Failing," Harvard Business Review, June 2006. David Young is a Professor of Accounting at INSEAD).

**There are three basic ways to increase the incentive contribution of holdings:**

1. Increase security leverage, e.g., substitute options, indexed options or performance stock for simple restricted stock (line D vs. E)
2. Increase holding periods through longer vesting, retention requirements and stock ownership requirements (line C vs. D).
3. Increase the percent of pay provided by stock and option grants (line A vs. C).

**Compensation committees must set cost-efficient incentive ("wealth leverage") targets and monitor their achievement.** Incentives are cost-efficient when the expected shareholder wealth gain from the stronger incentive exceeds the compensation cost premium, if any, required by the stronger incentive. Policies that increase the incentive contribution of stock and option holdings increase the cost of providing competitive compensation because they reduce the value of the company's compensation to an undiversified executive. A rational, but undiversified, executive will discount future cash flows for the total risk of the security, unlike a pension fund which will only discount future cash flows for their non-diversifiable risk. For the average company in the S&P 1500, each year of required holding reduces the executive value of stock by 8%. For options, which have even more diversifiable risk than the stock, the executive value discount is even greater. For the average company in the S&P 1500, the executive value of an at the money option with a six year expected term is only 42% of the Black-Scholes value of the option.

Thinking about value to undiversified executives makes it clear that the executive value of the company's compensation is reduced by substituting options for stock of equal company cost, by increasing vesting periods and other holding requirements and by substituting stock or options for cash compensation. Since a competitive pay policy only achieves its objectives if it provides competitive value to the executive, these strong incentive policies increase the cost of providing competitive pay and make sense only to

the extent that the expected shareholder wealth gain from the stronger incentive exceeds the additional cost of providing competitive pay. Our path-breaking research on the impact of wealth leverage on company performance provides an important input for this critical director judgment (Stephen F. O'Byrne and S. David Young, "Top Management Incentives and Company Performance," Morgan Stanley's *Journal of Applied Corporate Finance* (Fall 2005)). Our research shows that each additional 0.1 of wealth leverage is associated with an annualized excess return of 0.9%.

**Monte Carlo simulation is an essential tool for the compensation committee to understand:**

1. The wealth leverage provided by the current program,
2. The level and timing of the change in wealth leverage that would result from changes in security leverage, required holding periods and/or the percent of pay provided by stock and option grants,
3. The potential shareholder wealth gain from increases in top management wealth leverage,
4. The impact of the prospective pay program changes on the executive value of annual compensation and the additional company cost needed to provide competitive executive value, and
5. The break-even shareholder wealth gain needed to justify the additional compensation cost associated with increasing wealth leverage while maintaining competitive executive value.

Using the results of the Monte Carlo simulation, our research on the impact of wealth leverage of company performance and the directors' own judgment about the impact of incentives on company performance, the compensation committee can identify cost-efficient wealth targets and the time horizon needed to achieve them. The committee can then use the wealth leverage targets to monitor the program's success in providing strong, cost-efficient incentives to increase shareholder value.

#### References

Stephen F. O'Byrne and S. David Young, Top Management Incentives and Company Performance, *Journal of Applied Corporate Finance*, Fall 2005.

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