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Top Management Incentives and Corporate Performance

by Stephen F. O'Byrne, Shareholder Value Advisors, and S. David Young, INSEAD

Many critics of U.S. executive compensation are skeptical that compensation has a positive effect on top management decision-making or corporate performance.[1] Academic research has been unable to make a convincing case that strong incentives improve firm performance and thus has done little to diminish critics' skepticism.[2] Researchers have used many different measures of incentive strength, including pay sensitivity and pay "elasticity," without coming to a consensus on the "right" measure.[3] As a result, managers and directors continue to rely heavily on the conventional measure—percentage of pay "at risk"—as the main indicator of incentive strength.

As we will show, however, percentage of pay at risk is a misleading guide to the incentives provided by executive pay packages. For most companies, the amount of incentive compensation paid or granted in a given year—for example, the bonus paid or the grant date value of stock or option grants—has little correlation with the shareholder return in that year and so provides little incentive to increase value. At the same time, the change in the value of stock or options *previously granted* to the top managers of most companies is in fact *highly* correlated with shareholder return and provides strong incentives to increase shareholder wealth. And thus percentage of pay at risk appears to have turned the real story upside down: it exaggerates the typically modest incentives provided by current-year pay, while ignoring the considerable incentive power of prior stock and option grants.

Starting from the premise that managers, like investors, are motivated by prospective changes in their wealth, we present a measure of incentive strength that we call "wealth leverage." Wealth leverage measures the sensitivity of management's wealth to changes in shareholder wealth. And when we estimated top management's wealth leverage for 702 companies in Standard & Poor's ExecuComp database over the period 1995-2004, we came to three main conclusions:

1) for the median company, a 10% change in shareholder wealth changes management wealth by 4%, which implies that top management in the majority of U.S. companies has significant incentives to increase shareholder wealth;

2) for most companies, almost all wealth leverage comes from changes in the value of stock and option holdings, not from changes in the level of annual compensation; and

3) companies with higher wealth leverage significantly outperform their industry competitors, on average.

The Concept of Wealth Leverage

In contrast to media accounts, with their near-total focus on annual compensation, our approach focuses on changes in a manager's *company-related wealth*. Whereas annual compensation includes salary, bonus, and the value of current-year stock and option grants, wealth includes the manager's *total* company stock and option holdings plus the present value of the manager's expected *future* compensation. The present value of expected future compensation in turn includes the present value of expected future salary, bonus, stock compensation, and pension.[4]

Having come up with a measure of management's wealth, we need to decide on a measure of the annual *change in wealth* that provides the best proxy for the manager's incentive to increase firm value. Although some studies use dollar changes in wealth to evaluate the strength of incentives, we assume that the *percentage change* in the manager's wealth is a better proxy for the manager's motivation. (The basic insight here is that the prospect of an additional $1 million has less impact on a manager with $50 million than on a manager with $5 million.) The percentage change in a manager's wealth in any given year, or what we refer to as a manager's "wealth return," can be expressed as follows:

$$\text{Management Wealth Return} = \frac{\Delta\text{Management Wealth} + \text{Cash Received}}{\text{Beginning Wealth}}$$

where ΔManagement Wealth is the increase or decrease in the manager's company-related wealth (which includes the change in the present value of expected future compensation as well as the change in the value of stock and option holdings), and Cash Received is total cash compensation plus the proceeds from any stock sales.

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[1] See, for example, "Has Pay for Performance Had Its Day?," *The McKinsey Quarterly*, Number 4 (2002).

[2] Kevin Murphy, for example, notes that "...there is surprisingly little direct evidence that higher pay-performance sensitivities lead to higher stock-price performance"; see "Executive Compensation," *SSRN Working Paper Series* (posted May 19, 1999).

[3] Murphy (ibid.) notes that "the CEO pay literature has yet to reach a consensus on the appropriate methodologies and metrics to use in evaluating the implicit relation between CEO pay and company stock price performance."

[4] Proxies, our data source, do not include data on managers' other assets. If we accumulate the cash received from compensation and stock sales reported in the proxy and use the after-tax value of that cash as a proxy for the manager's other assets, we find that median company wealth leverage drops by 16%.

Wealth leverage, which is our measure of incentive strength, is the ratio of the management wealth return to the shareholder return:

$$\text{Wealth Leverage} = \frac{\text{Management Wealth Return}}{\text{Shareholder Wealth Return}}$$

$$\text{where Shareholder Wealth Return} = \frac{\Delta\text{Price} + \text{Dividends}}{\text{Beginning Price}}$$

Defined in this way, wealth leverage measures the sensitivity of changes in management wealth to changes in shareholder wealth.

To provide some sense of what such a ratio means, consider the case of a "pure" entrepreneur, who has 100% of his or her wealth in company stock. In this case, wealth leverage is 1.0 because any change in shareholder wealth (the value of the entrepreneur's firm) results in an equal percentage change in his or her wealth. At the other extreme is a manager with no equity ownership whose compensation consists entirely of salary and benefits. In that case, wealth leverage would be close to zero, depending on how year-to-year changes in salary and benefits were affected, if at all, by changes in the company's share value.

How Compensation Practices Affect Wealth Leverage

Before we describe our findings on management wealth leverage for a set of companies in Standard & Poor's ExecuComp database, let's use some simulated data to get a better understanding of the calculation and dynamics of wealth leverage.

We began by running 500 Monte Carlo simulations of the five-year stock price performance of a hypothetical company with an expected annual stock return of 9%. The 9% expected stock return was based on the Capital Asset Pricing Model with an assumed stock beta of 0.83 (the median for companies in the ExecuComp database), an equity risk premium of 5%, and a risk-free rate of 4.9%. We also assumed that shareholder wealth follows a log normal distribution with a volatility of 0.413 (the median standard deviation of the companies in the ExecuComp database) and that shareholder returns are uncorrelated from one year to the next. For simplicity, we assumed no dividends.

For each five-year Monte Carlo simulation, we calculated the year-by-year company-related wealth and wealth changes of a manager with a simple pay package: a base salary of $100,000 and a target bonus of $100,000. This gives the manager 50% of pay at risk, which is about average for the managers in ExecuComp. We assumed, for our first case, that the actual bonus as a percentage of target is equal to the ending shareholder wealth as a percentage of beginning shareholder wealth. With this formula, the bonus is the equivalent of investing the target bonus in the stock at the beginning of the year and then selling the stock at the end of the year.

Table 1 shows the simulation results for one of the 500 scenarios. At the beginning of year 1 (shown as the end of year 0), the manager's wealth is entirely the present value of expected future compensation. The present value of five years of expected salary ($100,000 per year) is $432,948, assuming a 5% discount rate. The present value of five years of expected bonus is also $432,948, for total wealth at the end of year 0 of $865,895.

At the end of year 1—a year in which the stock value is simulated to fall by 9.5%—the manager has received cash payments of $100,000 in salary and $90,530 in bonus and has four years of expected future compensation remaining. Summing the cash received of $190,530 with the present value of four more years of expected salary, $354,595, and the present value of four more years of expected bonus, $354,595, the manager's wealth at the end of year 1 is $899,720. This gives the manager a "wealth return" of 3.9% versus the shareholders' return of -9.5%. With similar calculations for each of the subsequent years, we see that the manager's wealth return ranges from a low of 1.5% in year 3 to a high of 11.8% in year 2, while the shareholders' return ranges from a low of -34.9% in year 3 to a high of 61.5% in year 2.

We then calculated the manager's wealth leverage by forming a trend line over the five-year period, with shareholder return as the independent variable and the manager's wealth return as the dependent variable. The slope of the trend line is the wealth leverage. For the manager in this example, as reported in Table 1, wealth leverage is 0.11—which means that a 10% increase in shareholder wealth is associated, on average, with an increase in manager wealth of 1.1%.

What's surprising here is that a compensation plan with fully 50% of pay at risk in a bonus scheme tied *directly* to shareholder return creates wealth leverage of only 0.11 (and the wealth leverage in this one scenario, by the way, is also the median wealth leverage of the 500 Monte Carlo scenarios). By comparison, an investor with 50% of his or her initial wealth in cash and 50% in company stock would have wealth leverage of 0.5 since a 10% increase in shareholder wealth would increase the investor's wealth by 5%. Thus, it's clear that a plan in which 50% of an executive's pay is at risk can provide much less incentive to create value than a plan with 50% of wealth in company stock.

The bonus plan in our example differs from long-term stock ownership in two important ways. First, the target

Table 6 **Wealth Leverage versus Performance**

Company	Exec Wealth Leverage	Compensation Leverage	Holdings Leverage	Average Holdings Pct of Wealth	Excess Return %ile
Danaher Corp	1.33	.25	1.39	48	91
Cisco Systems Inc	1.24	.56	1.29	64	94
Wal-Mart Stores	.82	.47	1.19	41	86
Best Buy Co Inc	.80	.13	1.19	59	98
General Electric Co	.76	.19	1.21	52	92
Penney (J C) Co	.21	-.07	1.48	21	19
Cooper Tire & Rubber Co	.16	.03	1.52	18	17
Toys R Us Inc	.15	.01	2.10	8	4
McDermott Intl Inc	.12	.02	1.45	10	12
Goodrich Corp	.04	-.01	1.69	15	16

increases the value of current and future compensation by 0.8%. The weighted holdings leverage of May Department Stores is about 75% of the weighted holdings leverage of Wal-Mart because May has higher holdings leverage (1.32 versus 1.19) which partly offsets the difference in stock and option holdings as a percent of wealth (27% versus 41%). The bigger difference between May and Wal-Mart, however, is compensation leverage. May has negative compensation leverage (-0.31), while Wal-Mart has significantly positive compensation leverage (0.47). A more detailed analysis of May's compensation leverage shows that May's bonus leverage is slightly positive (0.10), but its stock compensation leverage is highly negative (-0.71). The negative stock compensation leverage indicates that May has had a strong tendency to increase stock and option grants when the company is performing poorly.

Wealth Leverage and Corporate Performance

To assess the impact of wealth leverage on corporate performance, we measured the performance of our sample companies by their cumulative annualized excess stock returns, based on actual monthly returns minus expected monthly returns. Expected monthly returns are calculated as follows:

$$\beta_1 \times \text{the S\&P 500 return} + \beta_2 \times \text{the industry return for the month}$$

where β_1 and β_2 are the coefficients from a regression of the company return on market and industry returns for the 60 months prior to the current month.[12]

As can be seen in Figure 5, which shows the mean annualized excess return of the sample companies for each wealth leverage quartile, companies with higher wealth leverage had higher average excess returns. Moreover, when we regressed cumulative annualized excess returns on wealth leverage, the regression coefficient was significant at a 1% level and showed that a 0.10 increase in wealth leverage was associated with an increase in the annualized excess return of 0.91 percentage points.

It is possible that at least part of the positive correlation between wealth leverage and firm performance is attributable to the fact that stock price appreciation will increase both wealth leverage and annualized excess return. Stock price appreciation should increase the percentage of wealth in stock and option holdings, which has a relatively greater impact on wealth leverage than the present value of expected future compensation. To test whether the correlation between wealth leverage and excess return was due to a change in the percentage of wealth in stock and option holdings, we did a second regression using both wealth leverage and the change in percentage of wealth from holdings as independent variables, with the latter calculated as the difference between the average holdings percentage of wealth for 2000-2004 and the average holdings percentage of wealth for 1995-1999 (using beginning-of-year wealth values for all years). Both variables were significant at a 1% level, and the change in percentage of wealth from holdings was positively correlated with the excess return, as we would expect. But controlling for the change in percentage of wealth from holdings reduced the wealth leverage coefficient by only 0.03, from 0.091 to 0.088, indicating that the statistical impact of wealth leverage on firm performance is not attributable to changes in the percentage of wealth from holdings.

Table 6 shows five companies with high wealth leverage and superior performance and five companies with low wealth leverage and poor performance.

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[12] The industry return for each month is an equally weighted average of the monthly returns of all the companies in ExecuComp in the same industry group.

Conclusion

This article presents a measure of incentive strength called "wealth leverage." In contrast to the conventional focus on annual compensation, our approach focuses on changes in a manager's company-related wealth. Whereas annual compensation includes salary, bonus, and the value of current-year stock and option grants, wealth includes the manager's *total* company stock and option holdings plus the present value of the manager's expected *future* salary, bonus, stock compensation, and pension. In our view, taking such a comprehensive look at an executive's pay package is the only reliable way to assess its incentive power.

When we estimated this wealth leverage measure for the top managements of 702 companies in Standard & Poor's ExecuComp database over the period 1995-2004, we reached three main findings:

1) large public companies in the U.S. have significant wealth leverage—a 10% increase in shareholder wealth increases management wealth by 4% for the median company;

2) for most companies, almost all leverage comes from stock and option holdings with very little contribution from current compensation; and

3) companies with higher wealth leverage significantly outperform their industry peers.

For corporate compensation committees intent on providing executives with stronger incentives to increase value, our research has three main implications: 1) focus on wealth leverage, not the percentage of pay at risk; 2) make much stronger efforts to tie compensation to current shareholder returns; and 3) give high priority to policies that increase stock and option holdings, such as payment of bonuses in stock, long vesting requirements, stock ownership guidelines, and stock retention requirements.

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