

# Does your CEO compensation plan provide the right incentives?

David F. Larcker and Brian Tayan

Few boards look at how the CEO's total wealth invested in the company changes as stock prices fluctuate. They could—and they should.

Boards, shareholders, and journalists often look at a chief executive's annual compensation plan to determine whether the company is offering the right incentives to increase shareholder value. But few consider another key question: how does the compensation that the CEO has *already* received over the years in the form of stock and stock options influence managerial decision making? Our research shows that for most CEOs in the United States, accumulated wealth effects are likely to swamp those of year-to-year compensation—meriting serious attention when boards evaluate how risk structures and incentives of executive pay packages align with the company's strategy.

## Wealth effects

Since 2006, a wider array of data on executive holdings of stock and options has become available in proxy statements filed with

the US Securities and Exchange Commission. There is now enough of it to permit serious research. We began by taking the median total annual compensation of chief executives and comparing it with their median total accumulated wealth.<sup>1</sup> For those at the largest 20 percent of publicly traded companies, median accumulated wealth was nine times CEO median compensation. We also plotted the percentage change in CEO wealth against percentage changes in stock price and found that a 50 percent increase in stock price would translate, at the median, to an expected wealth gain of six times annual compensation. For smaller companies, total compensation levels are lower. The ratios of accumulated CEO wealth to income, as well as those of wealth increases to income resulting from significant stock price gains, are also somewhat lower.<sup>2</sup>

These results, which in large part reflect the leverage provided by stock option grants that are part of pay packages at many companies, highlight the substantial monetary incentives offered for CEOs to make strategic and investment decisions that increase shareholder value. Our data further indicate that wealth effects—and thus the levels of risk that CEOs are encouraged to take—vary widely, even among direct competitors. It is not always clear if this is intentional or simply the inadvertent, cumulative impact of grants made year after year at varying price levels that are either higher or lower than today's price—which could leave the chief executive with a portfolio of shares and options whose payoff function is quite different from what the board originally intended.

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### **Comparing pay structures via 'convexity'**

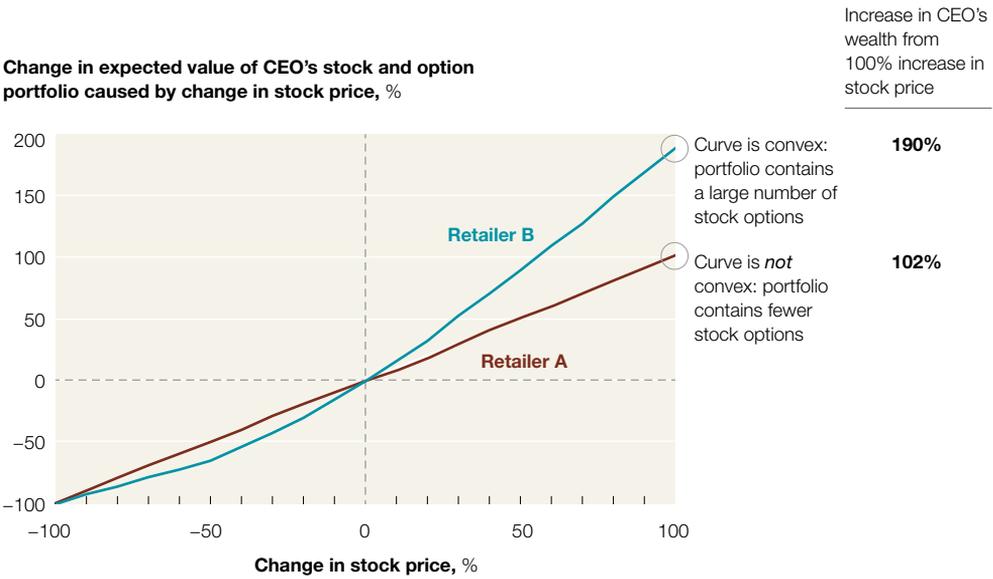
One practical way of making this assessment is to plot changes in CEO wealth against changes in the company share price and observe the shape (or "convexity") of this payoff curve. If the CEO's portfolio contains only shares, it will tend to rise and fall one-for-one with a change in stock price. We refer to this as "low convexity." If, however, the CEO's portfolio contains a large number of stock options, and especially multiple tranches of out-of-the-money stock options, the payoff curve can become quite steep (high convexity). Convex payoff structures such as these provide more financial incentives for CEOs to take on promising—albeit risky—investments because the CEO stands to earn very large rewards if successful. By performing this analysis, the board can benchmark the CEO's payoff function against those of direct competitors to determine whether the incentive structures are comparable to other leaders in the industry.

Consider the experiences of two CEOs from competing firms in the fashion retailing industry (Exhibit 1). Whereas a 100 percent increase in stock price would lead to a 102 percent increase in wealth for the CEO of one company, it would lead to a 190 percent increase in wealth for the second company—a much more convex payoff as a result of a richer mix of options. Compensation at the latter company may thus encourage greater risk taking. It might be the case

Exhibit 1

The shape—or ‘convexity’—of a CEO’s payoff curve provides a benchmark to determine whether the incentive structures are comparable to those of other industry leaders.

Example of 2 fashion retailers



Source: Calculations by David F. Larcker and Brian Tayan, based on compensation data provided in each company’s 2011 Form DEF-14A

that these are both appropriate arrangements, because the two firms face different strategic opportunities and challenges. It could also be the unintended result of option grant timing and market performance. Or it might be the case that the market opportunities for the companies are similar and the boards of one or both haven’t thought deeply about whether incentives are appropriate.

Similarly, we found that the CEO of one regulated public utility has convexity in his compensation of 1.00 (a 100 percent increase in stock price leads to a 100 percent increase in wealth), while the CEO of another public utility has convexity of 1.51. Here, too, having a clear picture of the two compensation contours can help board members decide on whether risk levels are appropriate for regulated utilities.

**Volatility as a window on risk**

We can take the analysis one step further and plot the change in expected CEO wealth against changes in stock price *volatility*. This additional detail can paint a stark picture of the degree to which boards are encouraging risk taking.

The foundation for this analysis is the incentives associated with stock options and grants: If a CEO's investment portfolio is heavily weighted toward options, he or she is motivated to take on

risky investments because the present value of the options package increases as volatility rises in step with a more ambitious and potentially uncertain strategy. If, on the other hand, the investment portfolio is composed entirely of stock, the CEO is not rewarded for volatility, creating an incentive to take on safer projects with lower risk and return.

This dynamic is illustrated by two pharmaceutical companies shown in Exhibit 2. The CEO of company

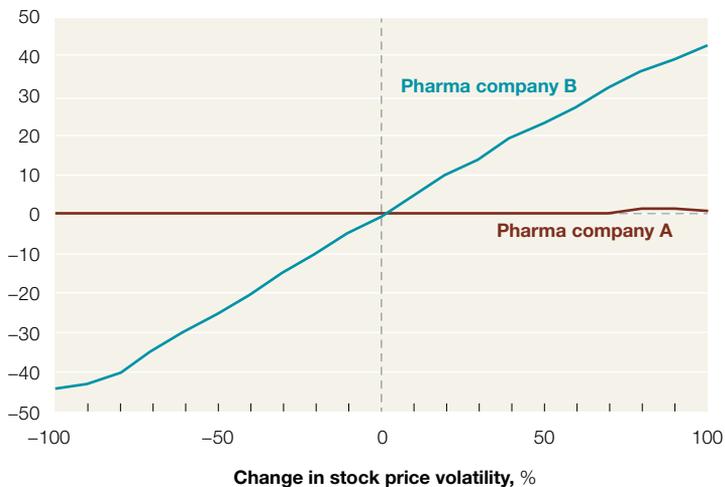
Exhibit 2

A significant share of compensation in stock options causes a CEO's payout to rise dramatically with a rise in stock price volatility.

Example of 2 pharmaceutical companies

**Change in expected value of CEO's stock and option portfolio caused by change in stock price volatility, %**

0 = current expected net present value at company's current volatility



Source: Calculations by David F. Larcker and Brian Tayan, based on compensation data provided in each company's 2011 Form DEF-14A

A holds only direct stock investments and restricted shares, so the executive's payout function is essentially a flat line and is unaffected by a volatile stock price. The CEO of company B, by contrast, receives a significant share of compensation in stock options, so the executive's payout rises dramatically with greater volatility, as shown by the upwardly sloping line.

Which is the better approach? The answer will depend on whether the success of the company requires innovation and risky investment or whether it requires the steady development of existing products. In the pharmaceutical industry, it is not hard to imagine that the board should encourage at least *some* level of risk. Risky projects that fail are sure to destroy value, but failure to innovate at all is also sure to destroy value.

### **Evaluating your CEO's payoff structure**

Since this analysis is relatively new, and wealth effects aren't routinely calculated and reported, we suggest boards do some benchmarking against peers to see if it raises questions about the financial incentives they have created for their CEO. Is risk in line with industry peers, and, more importantly, is it in line with the company's strategic objectives? Have changes in the stock market changed the convexity of the CEO's reward curve in a way that encourages excessive risk? If so, should the board change the mix of future annual pay grants to get the curve

back in line with objectives? Should it reprice existing options to reduce convexity? If the CEO wants to sell or hedge some of his or her personal portfolio in order to reduce personal-investment risk, how will this change the incentives to perform?

Boards should also be aware of how the effects of tenure may misalign CEO incentives and strategy over the longer term. For long-standing CEOs, convexity will often decline as options vest and wealth in the company shifts primarily to stock. The board in this case may want to amplify convexity to discourage risk aversion. In a less frequent occurrence, the time effects may actually *increase* convexity, when, for example, a company is recovering from a long-term decline in share price and an executive retains a substantial number of unexercised options that had been deeply out of the money. Here, appropriate action to dampen convexity may be required.

Finally, it is useful in another way for the board to understand the dollar amount that the CEO can earn if "all the stars align" for the firm and its stock price rises sharply. Boards are sometimes faced with the problem of what to say to activist shareholders and media when the CEO receives very large payouts. The wrong answer is, "We never looked at that, because we did not think it would happen." Many boards will likely find that the payout amounts for various levels of stock price targets are

much different than they expected, often encouraging too much or too little risk. That might also be true for other senior executives, and boards could do well, as a second step, to examine their payoff structures too. ○

<sup>1</sup> We define CEO wealth as the total value and the expected value of stock options that an executive continues to hold at a company. We exclude personal wealth outside company stock (this is not typically disclosed). Stock options are valued using the Black–Scholes pricing model, with the remaining term of the option reduced by 30 percent to compensate for potential early exercise or termination and volatility based on actual results from the previous year.

<sup>2</sup> For additional discussion of compensation and wealth effects, see David F. Larcker and Brian Tayan, *Sensitivity of CEO Wealth to Stock Price: A New Tool for Assessing Pay for Performance*, Stanford Graduate School of Business, Closer Look Series Case No. CGRP-10, September 2010.

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