FIRM EXPANSION AND CEO PAY

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ABSTRACT

We study the extent to which decisions to expand firm size are associated with increases in subsequent CEO compensation. Controlling for past stock performance, we find a positive correlation between CEO compensation and the CEO's past decisions to increase firm size. This correlation is economically meaningful; for example, other things being equal, CEOs who in the preceding three years were in the top quartile in terms of expanding by increasing the number of shares outstanding receive compensation that is higher by one-third than the compensation of CEOs belonging to the bottom quartile. We also find that stock returns are correlated with subsequent CEO pay only to the extent that they contribute to expanding firm size; only the component of past stock returns not distributed as dividends is correlated with subsequent CEO pay. Finally, we find an asymmetry between increases and decreases in size: while increases in firm size are followed by higher CEO pay, decreases in firm size are not followed by reduction in such pay. The association we find between CEOs' compensation and firm-expanding decisions undertaken earlier during their service could provide CEOs with incentives to expand firm size.

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1. Introduction

A long-standing view in economics and finance holds that managers have an excessive incentive to expand the size of their firm, (e.g., Baumol (1959), Jensen (1986), Morck, Shleifer, and Vishny (1990)). On this view, managers could choose to make some value-decreasing acquisitions, as well as to retain excessive cash flow instead of distributing it to shareholders. Managers might act in this way because increasing firm size could serve their private interests in various ways. Among other things, Jensen (1986) suggests that expanding firm size might benefit managers by enabling them to obtain larger executive pay.

The view that firm expansion might be rewarded by higher executive pay relies in part on the observation that pay and firm size appear to be correlated. As many studies document (see, e.g., Core, Holthausen, and Larcker (1999), and Cyert, Kang, and Kumar (2002))—and as any casual look at compensation tables published by the financial press suggests—larger firms tend to provide their CEOs with larger pay packages. However, upon reflection, the correlation between firm size and CEO pay does not establish that CEOs could increase the size of their pay package by expanding firm size or that CEO pay is correlated with the CEO's own choices whether (and to what extent) to expand firm size.

For example, suppose that the compensation of continuing CEOs at any given year is a function only of (i) the size of the firm when the executive started serving as a CEO (say, because firms with a larger size seek to attract more talented executives), and (ii) the stock performance of the company during the CEO's service thus far. If boards act in this way, expanding the size of the firm will by itself (i.e., putting aside any effect it might have on stock returns) have no effect on the CEO's subsequent compensation. In such a case, however, we will still observe a correlation between CEOs' current compensation and the size of their firms because the size of a continuing CEO's firm is likely to be correlated both with the firm's size when the CEO began serving and with the stock performance during the CEO's service. Thus, to identify whether the prospect of higher subsequent pay could provide CEOs with incentives to expand firm size, we need to investigate whether past CEO decisions to expand are followed by a compensation increase beyond the increase due to improved performance associated with these expansions (if any). We pursue such an investigation in this study.

We find that a CEO's compensation is correlated with the firm's stock performance during the preceding years of the CEO's service. We also find, however, that, controlling for such past performance, a CEO's compensation, as well as the change in the CEO's compensation from

earlier levels, is correlated with increases in the firm's size — in terms of either assets or sales — during the preceding years of the CEO's service.

We further investigate the association between pay and size-expansion decisions by decomposing changes in firm size into two components: increases in shares outstanding and increases in size (whether measured by assets or sales) per share. We find that, other things being equal, a CEO's current pay is correlated with the rate of growth in the number of shares outstanding during the CEO's preceding service. This rate of share growth is the product of (i) issuance of shares to finance acquisitions, (ii) issuance of shares to finance investments and internal expansion, (iii) issuances of shares to finance compensation to employees (in lieu of paying them in cash, which reduces firm size), and (iv) decisions whether to repurchase shares (which operate to reduce firm size and share growth). By increasing the number of shares outstanding, a CEO can increase firm size without necessarily increasing shareholder returns. The identified correlation between CEO pay and preceding growth of shares outstanding is economically meaningful: Holding all else constant, the average compensation in firms that belong to the top quartile in terms of change in shares outstanding in the preceding three years is higher by about one-third than the average compensation given to the bottom quartile.

We also find that, other things being equal (including past stock returns), a CEO's pay is correlated with the increase in assets per share and sales per share during the CEO's preceding service. This association is also economically meaningful. Holding all else constant, the average compensation in firms that belong to the top quartile in terms of increasing per share sales during the preceding three years is higher by about one-fifth than the average compensation given to the bottom quartile. Similarly, holding all else constant, the average compensation in firms that belong to the top quartile in terms of increasing per share assets during the preceding three years is higher by about one-fourth than the average compensation given to the bottom quartile. Because strategies that would maximize per share sales or per share assets might differ from ones that would maximize stockholder returns, these finding are also relevant for assessing executives' incentives.

We also decompose past stock returns under a continuing CEO into the capital gain component—that is, the part of the return not paid out as dividends—and the dividend component. We find that a CEO's compensation is correlated with the capital gain component of the stock returns under the CEO's preceding service, but we do not find such correlation for the dividend component. Because the dividend component of total stock returns does not contribute to firm size (even though it does contribute to shareholder wealth), this finding is

consistent with the general positive correlation we find between firm-expanding decisions and higher subsequent pay.

Our analysis of the expansion-compensation correlation also identifies an asymmetry between increases and decreases in firm size.[1] The positive correlation between compensation and size is driven by firms that increase firm size and not by firms that decrease firm size. There is correlation between size changes and compensation among CEOs who increase firm size but not among CEOs who decrease firm size.

We should stress that CEOs' firm-expansion decisions are influenced not only by expectations that expansion will be followed by higher subsequent pay but also by the expected effect that expansion decisions will have on the value of options and shares given to the CEOs earlier as part of their compensation packages. Other things being equal, such holdings of shares and options operate to align CEOs' incentives with those of the shareholders. Indeed, there is evidence that CEOs with larger holdings of shares and options are less likely to make value-decreasing acquisition decisions (see, e.g., Amihud and Lev (1981), Lewellen and Loderer (1984)). However, as we shall discuss in the next section, for any given level of managerial holdings of shares and options, CEOs' decisions will be distorted in the direction of excessive size expansion if expansion can be expected to produce higher subsequent pay.

We should also emphasize that our findings of correlation between firm expansion and subsequent pay does not indicate that current compensation practices are suboptimal. To be sure, such correlation might be the result of boards' use of benchmarking by size that compensation consultants recommend (Hall and Murphy (2003), Bebchuk and Fried (2004)). However, such correlation could also result from arm's length contracting between boards and managers. For example, a larger firm size might make it desirable to provide the CEO with more powerful incentives (Baker and Hall (2004)), and it also might strengthen the manager's bargaining position by increasing the cost to the company of replacing the manager or by providing the manager with experience that enhances the value of outside opportunities. Thus, even though a connection between firm expansion and subsequent pay might distort managers' ex ante choices, having such a connection might be necessary or optimal overall.

While our results do not necessarily indicate that current compensation patterns are suboptimal, they validate the concern expressed by Jensen (1986) and others that compensation

[1] Our analysis of this issue is in the spirit of Garvey and Milbourn (2005), who study whether pay responds differently to positive and negative changes in stock returns.

practices provide managers with incentives to expand firm size. Recognition and study of these incentives are important for understanding firms' decisions to issue shares, make acquisitions and investments, and distribute cash through cash dividends and repurchases.

Finally, it should be noted that managers' expansion decisions might be influenced by factors other than the effect of these decisions on the managers' current holdings of shares and options and their subsequent compensation. A distortion in favor of expansion produced by compensation practices could be strengthened by expectations that expansion would increase managers' power and prestige or make a takeover less likely. A distortion in favor of expansion, however, might also be mitigated by the presence of large block-holders and vigilant boards (which might lead to the firing of underperforming CEOs), by career concerns, by the market for corporate control, by the larger effort levels required to manage larger firms, or by other factors that might operate to discourage managers from producing low returns for shareholders (see, e.g., Benston (1985), Rosen (1992)). Thus, assessing whether and to what extent firm-expansion decisions are rewarded by compensation practices – our aim in this paper – is necessary but not sufficient for a full understanding of managers' private incentives with respect to firm expansion.

The remainder of this paper is organized as follows. Section II discusses the question we seek to investigate and the prior empirical work on the subject. Section III presents our empirical analysis. Section IV concludes.

2. Research questions and Prior work

2.1. Jensen's conjecture

A good statement of the conjecture we seek to study can be found in Jensen (1986). Jensen argues that "managers have incentive to cause their firms to grow beyond the optimal size." Some of these incentives, Jensen suggests, arise from the fact that growth is "associated with increases in managers' compensation."

The concern about CEOs' incentives arises from the plausible assumption that CEOs can have considerable influence on changes in firm size. While some relevant decisions (e.g., decisions to make acquisitions or distributions) are made by the board, CEOs wield considerable influence on whether the issue will reach the board and on the board's decision. CEOs are likely to have information that directors do not have, and they are often the ones that

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initiate firm-expansion decisions and make proposals and recommendations to the board. Which decisions concerning firm size would be value-maximizing is not observable and, thus commonly, cannot be decided by the board (or directly by shareholders) without any input from the firm's top executives. As a result, CEOs can influence the firm-expansion decisions that their firms make, and this influence in turn is shaped by their private incentives.

Compensation practices affect CEOs' payoffs from decisions concerning firm size in two ways. First, compensation arrangements provide CEOs with options and shares, and CEOs will likely take into account the effect of their decisions on the value of the portfolio of shares and options they hold as a result of prior compensation decisions. Second, CEOs might well take into account how their decisions will affect the value of (both cash and equity-based) compensation that they can expect to receive later on.

There are several reasons why CEOs might expect an increasing firm size to lead to increased compensation in subsequent periods. Even assuming that the board is solely focused on shareholder interests and engages in arm's-length contracting with the CEO, a larger firm size might lead the board to grant higher pay. An increased firm size might make it desirable to provide the CEO with more powerful incentives; might provide the manager with experience, visibility, and connections that could enhance the CEO's outside options; and might strengthen the CEO's bargaining position also by raising the costs of replacing the CEO with a new one. In addition, because a board might seek to maintain some parity with compensation in peer companies to avoid morale and prestige issues, a larger firm size could lead to the CEO's compensation being compared to that in larger companies with higher pay.

From the shareholders' perspective, the only relevant question is how a given firm-expansion decision will affect returns. From the manager's private perspective, however, both return and size matter, which means that the manager's decision would be distorted in favor of firm expansion. As long as the CEO can expect an increase in the firm size to increase the CEO's subsequent compensation, this expectation would introduce a distortion, on the margin, in favor of such a size expansion. The CEO's current holdings of shares and options could mitigate the magnitude of this distortion but not eliminate it.

To illustrate, consider a CEO who serves for two periods and is expected to receive in the beginning of each period 1% of the firm's shares. And suppose that during the first period, the CEO faces an opportunity to make a stock-financed acquisition that would double the company's number of shares and would change returns to existing shareholders by x%. In this situation, if x is negative, the CEO will take into account both (i) that the acquisition will

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reduce the value of the shares the CEO received in the beginning of the first period, and (ii) that the acquisition will double the number of shares that the CEO will receive in the beginning of the second period. Clearly, there is a range of negative values that x might take for which the CEO will still be better off making the acquisition.

To see the point more generally, consider a CEO who holds a fraction α of a company's shares as a result of earlier compensation decisions. Suppose that, without any firm-expansion decisions, the market value of the company's shares at the end of the current period will be W_0, and the value of the CEO's position will thus be αW_0. The CEO now faces an opportunity to take an action that would increase (some measure of) firm size by γ and will increase the return to the existing shareholders by ρ.

Suppose also that the compensation to the CEO, $C(\rho, \gamma)$, is an increasing function of both the return ρ and the size expansion γ.. In this case, the CEO will decide to expand size if and only if: $C(\rho, \gamma) + \alpha W_0 \rho > 0$. As long as $\partial C / \partial \gamma > 0$, the threshold ρ^* over which the CEO will make the acquisition will be negative. The intuition is that the CEO will be making a positive profit even for a firm-expansion action that breaks even for the existing shareholders ($\rho=0$). With $\rho=0$, the CEO will neither gain nor lose on the CEO's existing shares but will gain from obtaining a higher compensation in the next period. Thus, the threshold ρ^* at which the CEO breaks even from an expansion decision must be negative. Note that the larger α is, the weaker the distortion. As long as the expansion will bring about a higher next-period pay (i.e., $\partial C / \partial \gamma > 0$), however, there will be a distortion in favor of expansion. This association makes it important to find out whether, under current pay practices, CEOs can expect that, controlling for stock return performance, expansion will be followed by a pay increase.

The fact that an association between firm expansion and subsequent compensation might distort firm-expansion decisions does in no way imply that such a connection, if it exists, is a part of suboptimal pay practices. Ex post, i.e., after the expansion decision was made, it might be efficient for pay setting to be characterized by $\partial C / \partial \gamma > 0$. Thus, optimal setting of pay policy might involve a tradeoff between the ex post benefits of increasing pay when size increases and the ex ante costs that such a connection might have in terms of distorting earlier firm-expansion decisions. Thus, finding a correlation between compensation and earlier firm-expansion decisions under the CEO does not imply that existing compensation practices are suboptimal. But it does indicate that these practices produce incentives to expand that boards

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should recognize, and that researchers studying firm acquisition, investment, and distribution decisions should take into account.

Finally, it should be noted that, while we focus on identifying whether compensation practices provide incentives to expand firm size, such incentives may be reinforced or countervailed by other factors. Expansion decisions might affect the CEO's utility in ways other than through their effect on the CEO's compensation. A larger firm size might affect the CEO's utility directly both positively (by enhancing the CEO's prestige, power, perquisites, etc.) and negatively (by increasing the effort the CEO will have to exert or the pressures to which the CEO will be subject). In addition, firm expansion, and the effect that it will have on returns, will affect the likelihood that the CEO will be able to remain in office as well as the subsequent career opportunities that the CEO will have.

2.2. Prior empirical work

There is a large body of empirical literature on CEO compensation (see Murphy (1999), and Core, Guay, and Larcker (2003) for excellent surveys). In existing studies, researchers seeking to explain current CEO compensation often include current firm size as well as past stock return performance in their regressions. The general findings in the literature are that CEO pay is correlated with current firm size and with the firm's stock performance in preceding years (see, e.g., Murphy (1985, 1986), Jensen and Murphy (1990), Hubbard and Palia (1995), Core, Holthausen, and Larcker (1999), Cyert, Kang, and Kumar (2002)). Our analysis also finds, unsurprisingly, that compensation is correlated with past stock returns. We seek to contribute, however, by adding as independent variables other changes in the firm during the preceding years of the CEO's service, including the rate of growth of shares outstanding, the growth in per share assets and per share sales, and dividend decisions.

There has also been some significant empirical work on the connection between compensation and decisions to make acquisitions, which are an important type of firm-expansion decisions. Several papers study how acquisition decisions are influenced by managers' holdings of shares and options at the time of the acquisition decision (Agrawal and Mendelker (1987), Bliss and Rosen (2001), Datta, Iskandar-Datta, and Raman (2001)). More closely related to our work are several papers that focus on how acquisition decisions affect subsequent executive pay. Bliss and Rosen (2001), Grinstein and Hribar (2004), and Harford

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and Li (2005) find that acquisitions have a positive effect on subsequent pay, but Avery, Chevalier, and Schaefer(1998) do not find such an effect.

We complement the above studies of the association between acquisitions and subsequent pay by looking at a broader set of expansion decisions and strategies. While these studies focus on firms that make large acquisitions, some firms grow substantially through a series of small or medium acquisitions rather than one large acquisition. Furthermore, acquisition decisions are not the only decisions made by CEOs that have an effect on firm size. Executives can also increase firm size by raising equity to finance internal expansion, avoiding dividends and share buybacks, making operating decisions that would increase sales or assets without necessarily contributing to profits, and so on and so forth. Our strategy is to focus on the correlation between a CEO's compensation and the whole universe of the CEO's expanding decisions during a period of the past two to four years.

Finally, it is worth noting the significant literature that documents the tendency of managers to make some size-increasing decisions that are not value-enhancing. For example, there is a significant body of empirical work suggesting that managers sometimes elect to make acquisition decisions that appear to be value-reducing, (see, e.g., Lang, Stulz, and Walkling (1991), Morck, Shleifer, and Vishny (1990), Qui (2004), Moeller, Schlingemann, and Stulz (2005), and Masulis, Wang, and Xie (2005)). Our work complements this line of work by investigating the private benefits that might provide managers with incentives to make such firm-expansion decisions.

3. Empirical analysis

3.1. The Data

Our primary data source is the Execucomp database. We use information about CEO compensation in public U.S. companies from 1993 onwards. The database includes all of the S&P 500, Mid-Cap 400 and Small-Cap 600 companies, as well as companies that once belonged to these indexes. Together, these firms constitute more than 80% of the total market capitalization of U.S. public firms. We obtain financial information about firms in our sample from the Compustat database and the CRSP database.

Our strategy is to study the relation between the compensation of CEOs and their prior performance and firm-expansion decisions. We therefore include in our analysis of

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compensation in any given year only "continuing" CEOs who have been in the Execucomp database and served in their position for a given period of time. We initially look at performance and firm expansion in the preceding three years, and therefore focus on the set of CEOs who already served for three or more years. For robustness, we later perform a similar analysis for different time windows, looking at the past two-year record of CEOs with two or more years of experience and the past four-year record of CEOs with four or more years of experience, and we obtain similar results.

We focus on CEO compensation during the years 1997-2002. Throughout the study we divide our sample into six subsets of data, one for every year, and perform the cross-sectional analysis separately on each of these subsets. We do not use pooled regressions in order to avoid the potential correlations in errors in panel-data studies with repeated observations. To adjust for inflation, we translate throughout all monetary figures to 2002 dollars.

Table 1 displays summary statistics of the characteristics of the firms in which CEOs served during the preceding three years.

We define throughout our analysis annual CEO compensation as the TDC1 variable in the Execucomp database, which is the sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and other compensation. Median annual compensation is $2.36 million in 1997 and $3.04 million in 2002, and it peaks at $3.26 million in 2000.

Market capitalization is defined as the price per share multiplied by the number of shares outstanding (in millions) at the end of the calendar year. Median market capitalization in our annual subsets ranges between $1.83 billion in 1997 and $1.13 billion in 2002. Sales are the net sales of the firm at the end of the year (Compustat item #12). Median sales in our annual subsets range between $1.4 billion in 1997 and $1.13 billion in 2002.

The stock return variable is the total stock return, with dividend, net of inflation. The returns are calculated from the end of calendar year t-3 to the end of calendar year t. The median three-year return of firms in our sample is 66% in 1997, and drops to 4% in 2002.

The growth in shares outstanding variables is defined as the three-year net percentage increase in shares outstanding, adjusted for stock splits. This variable captures changes in the size of existing assets due to managerial decisions to make equity-financed acquisition or investments, to pay employees with options and shares in lieu of cash compensation, and to avoid share repurchases. The percentage of firms that had a positive growth of shares outstanding in the preceding three years ranges between 52%-63% in our annual subsets.

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Since the distribution of change-in-size variables is important to our analysis, we report the bottom quartile, median, and top quartile values for these variables. The threshold of growth of shares outstanding that defines the top quartile ranges between 14% and 20% in our annual subsets. The threshold that defines the bottom quartile ranges from -6% to -2%. The three-year growth in sales per share that defines the top quartile ranges between 14% and 39%, and the growth that defines the bottom quartile ranges between -4% to -6%. There is also substantial variability in growth in asset per share. The growth that defines the top quartile ranges between 39%-61%, and the growth that defines the bottom quartile ranges between -8% and -7%.

3.2. Pay and firm size

Our starting point is the correlation documented in the literature between CEO compensation and firm size. We therefore start by establishing the relation between compensation and firm size in our sample. To this end, we regress log (CEO compensation) on the firm's log market capitalization and log sales. (We will use log assets as another size variable in the regressions of Section 3.7.)

We include in the regression, as well as in subsequent regressions, several control variables. We include industry dummies, following the classification of 48 industries introduced by Fama and French (1997). We also include a New Economy dummy, using the classification of Murphy (2003), to account for growth opportunities specific to internet and computer-related firms.

Smith and Watts (1992) show that growth opportunities are positively related to CEO compensation. To control for growth opportunities, we include industry-adjusted Tobin's Q as an independent variable. We use industry adjustment here because our regressions already include industry dummies. We define industry-adjusted Q as log(Q) of the firm at the end of the compensation year minus the median log(Q) in the firm's industry at that time. We define Q as the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. To control for firms' risk, we also include the standard deviation of the firm's return, which we estimate over the preceding four years. The regression we run is as follows:

$$Log(Compensation_t) = a_0 + a_1 Log(MarketCap_t) + a_2 Log(Sales_t) + a_3 Industry\_Adjusted\_Q \quad (1)$$
$$+ a_4 Return\_variability + a_5 New\_Economy + Industry\_Dummies + \varepsilon$$

Table 2 shows the coefficient estimates of regression (1) for each of the years 1997-2002. As Table 2 indicates, compensation is positively correlated with each of the two measures of firm size we use in each and every year. The coefficient of Log (Market Capitalization) ranges between 0.29 and 0.32 and is statistically significant at the 1% level in all years. The coefficient of Log(Sales) is also positive, ranging between 0.18 and 0.30, and is significant in all years (and at the 1% level in five out of the six years). Consistent with previous studies (e.g., Cyert, Kang, and Kumar (2002), and Core, Guay, and Larcker (1999)), the return variability coefficient is positive and significant at the 1% or 5% level throughout. The New Economy dummy is positive and significant in most of the years.

3.3. Pay and changes in firm size under the CEO

Our first step in the analysis of the relation between compensation and firm size is to take into account the fact that firm size is not an exogenous variable but rather is partly a product of the CEO's decisions during the preceding years. Recognizing this fact, we decompose market capitalization and sales in year t as follows:

$$MarketCap(t)=MarketCap(t-3)*MarketCapGrowth(t-3\ to\ t)$$
$$Sales(t)=Sales(t-3)*SalesGrowth(t-3\ to\ t)$$

We apply this decomposition to regression (1) to get the following regression:

$$Log(Compensation_t) = a_0 + a_1 Log(MarketCapGrowth_{t-3\ to\ t}) + a_2 Log(SalesGrowth_{t-3\ to\ t}) + \quad (2)$$
$$a_3 Log(MarketCap_{t-3}) + a_4 Log(Sales_{t-3}) + a_5 Industry\_Adjusted\_Q + a_6 Return\_variability +$$
$$a_7 New\_Economy + Industry\_Dummies + \varepsilon$$

Table 3 displays the results of regression (2). The results indicate that compensation levels are correlated with past increases in market capitalization and sales. The coefficient of the increase in market capitalization during the preceding three years is positive and statistically significant at the 1% level in each of the annual regressions. The coefficient of the increase in

sales during the preceding three years is also positive in all six regressions, and it is significant at the 1% level in four of them and at the 5% level in the other two.

3.4. Pay, past returns, and growth in shares outstanding

We saw in the preceding section that current compensation is correlated with past increases in market capitalization and sales. This finding, however, could be fully driven by a correlation between compensation and past stock returns. Past increases in market capitalization might be fully driven by increases in the firm's stock prices, and past increases in sales might be correlated with past stock returns. Thus, the above results do not indicate that increases in firm size are correlated with subsequent pay other than through their effects on stockholder returns.

In our next regression we therefore replace the growth of market cap from t-3 to t with two variables: the stock market return from t-3 to t, and the rate of growth of shares outstanding from t-3 to t. The stock return represents how much shareholder wealth has appreciated, and it is the primary variable that the literature has used as a measure of past performance. Other than by increasing stock returns, however, executives can increase the firm's market capitalization by increasing the number of shares outstanding. By issuing additional shares at the current market price, executives can increase the firm's capital and equity capitalization without increasing the stock price.

As Fama and French (2005) document, firms change the number of shares outstanding in connection with several main types of transactions/events. First, firms make stock-financed acquisitions. Second, firms raise capital through secondary equity offerings, private placements of equity, and rights offerings. Third, by paying employees (and sometimes creditors) with equity rather than cash, firms are able to retain cash they would otherwise have to expend. Finally, firms also sometimes take steps, such as share repurchases, that reduce the number of shares outstanding.

Since we are interested in the aggregate effect of executives' firm-expansion decisions, we use in our regression the net growth in shares outstanding (from all sources). In our sample, the number of firms with net share issuances in the previous three years ranges between 52% and 63%. As a comparison, Fama and French (2005), report that 66.5% of firms that are larger in assets than the median New York Stock Exchange (NYSE) firm have a positive annual growth in shares outstanding between the years 1993-2002.

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Given the inclusion of the growth of shares outstanding in the regression, and the potential correlation between increase in shares outstanding and increase in sales, we decomposed the increase in sales into the growth in shares outstanding component and the growth in per share sales, and we therefore include the latter in the regression alongside the former. With these substitutions, we run the following regression:

$$Log\ (Compensati on_{t}) = a_{0} + a_{1}Log(StockR eturn_{t-3 to t})$$ (3)
$$+ a_{2}Log\ (GrowthSha resOutstan ding_{t-3 to t}) + a_{3}Log\ (GrowthSal esPerShare_{t-3 to t})$$
$$+ a_{4}Log\ (M ktCap_{t-3}) + a_{5}Log\ (Sales_{t-3}) + a_{6}Industry\_A djusted\_Q$$
$$+ a_{7}Return\_var iability + a_{8}New\_Econom y + Industry\_D ummies + \varepsilon$$

The results of the estimation of regression (3) appear in Table 4. Consistent with the results in the literature, compensation is correlated with three-year stock returns. The result is significant at the 5% level or better in each of the annual regressions. But the correlation of current compensation with past changes goes beyond the relationship of current compensation with past stock returns. The coefficient of the growth in shares outstanding is positive and significant at the 1% level in each of the regressions. Clearly, transactions involving an increase in the number of shares (e.g., making a stock-financed acquisition) are not necessarily value-increasing. Thus, the association between increases in shares outstanding and higher subsequent pay is of interest.

In addition, the coefficient of growth in sales per share is positive in all regressions, significant at the 5% level or better, in four out of the six regressions. Note that firms can expand per share sales without increasing stock returns (say, by increasing sales at prices that do not contribute to increasing profits). Furthermore, when two strategies to increase per share sales could both contribute to increasing stock returns, the strategy that increases per share sales the most might not be the one that would increase returns the most. Thus, the finding that, controlling for returns, increase in per share sales are correlated with higher subsequent pay is of interest.

The log-log specification implies that the coefficients of the independent variables in Table 4 represent the elasticity of compensation to each of the variables—that is, the percentage increase in CEO compensation for a 1% change in the independent variable. A one-percent growth in shares outstanding is associated, controlling for past returns, with 0.56%-0.97% increase in compensation (depending on the year examined). A one-percent growth in sales per

share is associated, controlling for past returns, with 0.16%-0.43% increase in compensation (depending on the year examined).

Of course, how much economic significance these two size-expansion variables have depends on their variability. To get a sense of this economic significance, we reran the regression (3) replacing the growth in share outstanding variable with three dummy variables for whether the firm is in the second, third, or fourth quartile in the yearly subsamples in terms of their three-year net growth in shares. In this regression, the coefficient of the top quartile represents the increase in compensation, controlling for past returns, associated with a CEO's being in the top quarter in terms of net share issuance rather than in the bottom quarter. The estimated coefficient of the top quartile in these regressions ranges between 47% (in 1998) and 29% (in 2001), with an average of 38%. Thus, the association between compensation and net share issuance is economically meaningful.

We similarly also reran regression (3) replacing the growth in per-share sales with three dummy variables for whether the firm is in the second, third, or fourth quartile in the yearly subsamples in terms of growth in sales-per-share. The estimated coefficient of the top quartile in these regressions ranges between 7% (in 1997) and 35% (in 2001), with an average of 22%. Therefore, controlling for past stock returns, increases in sales per share also have an economically meaningful effect on compensation.

3.5. Changes in compensation

In the level regressions we have used thus far, we controlled for differences among firms in past returns, initial size, industry classification, investment opportunities, and return variability. However, there remains the possibility that our results concerning the correlation of compensation with growth in shares outstanding and in sales per share are driven by an omitted variable that is correlated with one or both of these variables. While such a possibility is commonly difficult to rule out completely, we seek to explore it by comparing current compensation in a given firm to earlier compensation level in that same firm rather than only to current compensation levels in other firms.

In particular, we rerun regression 3, but use compensation growth over the past three years—rather than the compensation level—as the dependent variable. We also decompose the independent variables industry-adjusted Q and return variability into their levels three years

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earlier and the changes in these variables over the following three years. We present the results in Table 5.

As one can expect, the adjusted R-square in the change-in-compensation regressions displayed in Table 5 is considerably smaller than the one in the compensation level regressions. However, the association between compensation changes and our main variables of interest is similar to the association that we found earlier between compensation levels and these variables. The coefficient of the growth in shares outstanding is positive in all regressions and significant at the 1% level in five out of the six regressions. The coefficient of the growth in sales per share is positive and significant in four out of the six regressions. Thus, these results reinforce the results of the preceding sections that firm-expansion decisions are correlated with increases in subsequent compensation.

3.6. Different Windows

We have thus far focused on the correlation between compensation in a given year and three-year changes in firm variables under the CEO's management, and we have therefore focused in each year on the set of CEOs who have served in this position in the preceding three years. Since the choice of a three-year period is an ad hoc one, we reran our regressions once focusing on changes in the preceding two years (and using the set of all CEOs who have served in their position during this period) and once focusing on changes in the preceding four years (and using here all CEOs with four or more years of preceding service in this position).

Table 6 shows the coefficients of the two main variables of interest—the growth in shares outstanding and the growth in sales-per-share—for each one of the annual level regressions and change-in-level regressions specified in sections D and E for the two-year and four-year intervals. Table 6, panel A displays the coefficients of these variables for the two-year interval. The coefficient of the growth in shares outstanding is positive in all the regressions and is significant at the 5% level or better in all the compensation-level regressions and in four out of the six change-in-compensation regressions. The coefficient of the growth in sales per share variable is positive in all the regressions and is significant at the 5% level or better in a substantial number of them.

Table 6, panel B displays the coefficients of growth in shares outstanding and growth in sales-per-share for the four-year interval. The coefficient of the growth in shares outstanding is

positive and significant at the 5% level or better in all of them. The coefficient of the growth in sales-per-share is positive in all the regressions and is significant in four of them.

These results are consistent with the results obtained earlier in the regressions focusing on compensation levels and changes-in-levels in the preceding three years.

3.7. Growth in Assets

Jensen (1986) argues that compensation is correlated with firm size but does not specify which measure of firm size should be correlated with managerial compensation. We have thus far focused on two measures of size — market capitalization and sales. A third measure of firm size that is used in the literature is firms' book value of assets. We therefore run the regressions in sections D, E, and F using the book value of assets instead of sales. Consistent with our methodology, we decompose the growth in firm assets into growth in assets-per-share and growth in shares outstanding and include the former in the regressions along with the latter.

Table 7 presents the coefficients of growth of assets per share and growth in shares outstanding for all the regressions we performed. Panel A of this table presents the results of the regressions using two-year intervals, Panel B presents the results for three-year intervals, and Panel C presents the results for four-year intervals.

Consistent with our previous results, the coefficient of growth in shares outstanding remains positive and significant in almost all the regressions. We also find that growth in assets-per-share is positive in almost all the regressions and significant in the majority of them. Thus, our finding of a correlation between compensation and increases in size per share is robust to using assets rather than sales as the measure of firm size.

We also reran the level regressions, replacing the growth in per-share assets with three dummy variables for whether the firm is in the second, third, or fourth quartile in terms of growth in assets-per-share in the yearly sub-samples. The estimated coefficient of the top quartile in these regressions ranges between 7% (in 1997) and 42% (in 1999), with an average of 27%. Thus, controlling for past stock returns, increases in assets per share also have an economically meaningful association with compensation.

Because a firm can add assets that would not add to profitability (and might even reduce it), a strategy that would maximize growth of assets per share would, of course, not necessarily maximize stockholders' returns. Thus, as with our finding concerning the correlation between

compensation and growth in sales-per-share, the finding that compensation is correlated with growth in assets per share during the CEO's service is of interest.

3.8. Increases vs. Decreases in Firm Size

In our analysis of the correlation between compensation and changes in firm size, we have thus far not distinguished between increases and decreases in firm size. The coefficient of an increase in firm size variable captures the average association across both firms that increased in size and firms that decreased in size. It is therefore possible that the correlation between compensation and changes in size is different among firms that increase in size than among firms that decrease in size.

To explore this issue, we repeat the regressions of sections D and E, but this time we decompose the growth in shares outstanding and the growth in sales-per-share into positive growth and negative growth. This decomposition permits the coefficient to differ across firms that increase in size and firms that decrease in size. We present the results in Table 8.

Table 8 indicates that, for companies that increased shares outstanding, the coefficient of changes in shares outstanding is positive and significant across all regressions. For firms that reduced shares outstanding, however, the coefficient of changes in shares outstanding is not significant in any of the regressions. This result suggests that the correlation between compensation and changes in shares outstanding is driven by firms with CEOs who increased firm size. There is an asymmetry in the response of current compensation to changes in firm size under the CEO's management: When firm size increases, there is an increase in compensation; but when firm size decreases, there is no decrease in compensation.

We obtain similar results for the coefficient of sales-per-share. For firms that had a positive change in sales-per-share, the coefficient of change in such sales is positive and significant in all the level regressions and in three of the change-in-compensation regressions. In contrast, for firms that had a negative change in sales-per-share, the coefficient of change in sales-per-share is not significant in all of the level regressions and in five out of the six change-in-compensation regressions.

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3.9. Executive Pay and Dividend Decisions

We have thus far included in our regressions the standard stock return variable, which measures total returns to shareholders, including dividends. The literature, seeking to explain CEO compensation, uses total stockholder returns because it assumes that shareholders benefit from total returns, including their dividend component, and therefore CEOs should be rewarded for both the capital gains component and the dividend component of the total return.

However, given our finding that current compensation is correlated with past changes in firm size, it is worth separating the stock return into the capital gain component and the dividend component. The part of the total stock return that is in the form of capital gain does contribute to increasing the firm's market capitalization, but the part that is distributed as dividend does not contribute to increasing the firm's market capitalization.

Having seen that current compensation is correlated with past stock returns, we therefore now wish to explore whether compensation is correlated to the same extent with the capital gains component and the dividend component of stock returns. We therefore extend our analysis by decomposing past stock returns into two components: (i) the return excluding dividends (taken from CRSP), and (ii) the return from dividends, which is defined as the total return with dividend reinvested (also from CRSP) minus return without dividends. We then re-run the basic regressions of sections D (where the dependent variable is the level of CEO compensation) and of section E (where the dependent variable is the change in CEO compensation), replacing the (total) stock return variable with a return excluding dividends variable and a dividend return variable. For robustness, we also check whether our results extend to two-year intervals and four-year intervals.

Table 9 presents the coefficients of the return excluding dividends and the dividend return in all of these regressions. The results in Table 9 indicate that the coefficient of the return excluding dividends variable is positive and significant in all the compensation level regressions and in all the change-in-compensation regressions. It is also significant across the two-year, three-year, and four-year intervals.

In contrast, the coefficient of the dividend return is, in general, not positively significant. Out of the 34 annual regressions we run, the coefficient of the dividend return is not significant in 28 of them, is negative and significant in 3 of them, and is positive and significant in 3 of them. Thus, we find no evidence that a CEO's current compensation is correlated with the dividend component of past returns under the CEO in the same way that it is correlated with

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the undistributed, capital gain component of past returns. This finding is consistent with the concern of Jensen (1986) that CEOs might have insufficient incentives to pay dividends.

4. Conclusion

This paper has investigated empirically the validity of the concern expressed by Jensen (1986) and others that executive compensation practices might, overall, provide executives with incentives to expand firm size. We have found that increases in a firm's size during a CEO's service are associated with higher subsequent pay—both relative to CEOs in other companies and relative to the compensation the CEO had earlier. Decomposing changes in size (as measured by either assets or sales) into changes in size per share and in the number of shares outstanding, we find that changes in either component are associated with higher subsequent pay for the CEO. We also find that compensation is correlated only with the component of past stockholder returns that is not distributed as dividends.

The association we find between increases in firm size and higher subsequent CEO pay is economically meaningful. As emphasized throughout, this association does not indicate that compensation practices are suboptimal. But it does indicate that, overall, compensation practices provide managers with excessive incentives to expand firm size. The effects of these incentives might be mitigated in part or wholly by other factors affecting managers' decisions. But taking these incentives into account is necessary for a full understanding of the decisions that public firms make with respect to acquisitions, share issuance, capital-raising, operating strategy, share buybacks, and dividends.

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TABLE 1: SUMMARY STATISTICS

The sample consists of firms that have CEO compensation data in the Execucomp database. In each year, we consider firms whose CEOs were not replaced in the preceding three years. Financial information is from Compustat and CRSP. Compensation in any given year is defined as the sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and other compensation. Market cap is the number of shares outstanding multiplied by the stock price at the end of the calendar year. Growth in shares outstanding is the number of shares in the end of year t minus the number of shares in the end of year t-3 (adjusted for stock splits), divided by the number of shares at the end of year t-3. Return variability is the monthly standard deviation of the stock return (with dividends), measured over the 48 months between year t-4 and year t.. New Economy firms is as defined in Murphy (2003).

	1997	1998	1999	2000	2001	2002
Median Compensation ($K)	2359	2501	3034	3257	3161	3040
Median Market value ($M)	1829	1475	1671	1517	1453	1130
Median Assets ($M)	1713	1770	2052	1924	1759	1682
Median Sales ($M)	1416	1426	1540	1501	1359	1136
Three-year growth in compensation – Median	37%	44%	46%	39%	31%	14%
Three-year stock return – Median	66%	39%	14%	7%	12%	4%
Standard deviation of returns – Median	7%	9%	10%	11%	12%	12%
Three-year growth in shares outstanding						
25% Quartile	-2%	-3%	-3%	-6%	-4%	-3%
50% Quartile	2%	2%	2%	1%	2%	3%
75% Quartile	16%	17%	20%	16%	17%	14%
Three-year growth in sales-per-share						
25% Quartile	1%	0%	0%	6%	-4%	-14%
50% Quartile	20%	18%	17%	25%	16%	6%
75% Quartile	31%	31%	34%	39%	29%	14%
Three-year growth in assets-per-share						
25% Quartile	0%	1%	6%	7%	0%	-8%
50% Quartile	19%	22%	24%	25%	22%	15%
75% Quartile	46%	50%	57%	61%	54%	39%

TABLE 2: PAY AND FIRM VARIABLES

The table shows regression results of CEO compensation on firm characteristics. The sample consists of firms that have CEO compensation data in the Execucomp database. In each year, we consider firms whose CEOs were not replaced in the preceding three years. The dependent variable is the log of CEO compensation. Compensation in any given year is defined as the sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and other compensation. Financial information is from Compustat and CRSP. Market cap is the log of the market value of equity at the end of the calendar year, where the market value of equity is the price at the end of the calendar year, multiplied by the shares outstanding at the end of the calendar year. Sales is the log of the sales (in $millions). Industry-adjusted Q is the log of the firm's Tobin's Q in the end of the year minus the log of the median Q in the industry that the firm belongs to. Tobin's Q is defined as the market value of the equity plus the book value of assets, minus the book value of equity, all divided by the book value of assets. Return variability is the monthly standard deviation of the stock return, measured over the last 48 months. New Economy firm is as defined in Murphy (2003). Industry dummies are as defined in Fama and French (1997). All variables are adjusted for inflation and are in 2002 dollars. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *, **, *** represent statistical significance at the 10%, 5% and 1% levels respectively.

	1997	1998	1999	2000	2001	2002
Intercept	3.66***	5.12***	3.70***	3.90***	3.29***	3.24***
	(0.48)	(0.37)	(0.47)	(0.43)	(0.47)	(0.60)
Market cap	0.39***	0.31***	0.30***	0.21***	0.34***	0.33***
	(0.07)	(0.06)	(0.05)	(0.04)	(0.05)	(0.05)
Sales	0.12*	0.15***	0.29***	0.34***	0.23***	0.22***
	(0.06)	(0.06)	(0.05)	(0.04)	(0.05)	(0.05)
Industry-adjusted Q	-0.08	-0.04	0.10	0.21**	0.00	-0.12
	(0.12)	(0.11)	(0.10)	(0.09)	(0.09)	(0.11)
Return variability	2.93**	1.91***	5.19***	5.76***	5.09***	3.17***
	(1.27)	(0.50)	(0.96)	(0.83)	(0.62)	(0.66)
New-economy dummy	0.42**	0.24	0.48**	0.55***	0.57***	0.56***
	(0.19)	(0.20)	(0.19)	(0.19)	(0.15)	(0.16)
Industry dummies	+	+	+	+	+	+
Observations	531	509	497	482	492	545
Adjusted R^2	54%	52%	63%	63%	65%	51%

TABLE 3: PAY AND PAST CHANGES IN FIRM SIZE

The table shows regression results of CEO compensation on changes in firm characteristics. The sample consists of firms that have CEO compensation data in the Execucomp database. In each year, we consider firms whose CEOs were not replaced in the preceding three years. The dependent variable is log of CEO compensation. Compensation in any given year is defined as the sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and other compensation. Financial information is from Compustat and CRSP. Market cap growth is market cap in year (t) minus market cap in year (t-3). Sales growth is sales in year (t) minus sales in year (t-3). The rest of the variables are as defined in Table 2. All variables are adjusted for inflation and are in 2002 dollars. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively. The intercept coefficient is omitted from the table.

	1997	1998	1999	2000	2001	2002
Changes in firm variables during the preceding three years						
Market cap growth (t-3 to t)	0.55***	0.37***	0.25***	0.22***	0.37***	0.37***
	(0.09)	(0.08)	(0.07)	(0.05)	(0.07)	(0.07)
Sales growth (t-3 to t)	0.09	0.34***	0.38***	0.28***	0.24***	0.13
	(0.10)	(0.10)	(0.09)	(0.07)	(0.08)	(0.10)
Initial firm variables						
Market cap (t-3)	0.36***	0.33***	0.32***	0.20***	0.32***	0.32***
	(0.07)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Sales (t-3)	0.13**	0.14**	0.27***	0.36***	0.24***	0.24***
	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)
Control variables						
Industry-adjusted Q	-0.15	-0.12	0.09	0.24**	0.00	-0.10
	(0.12)	(0.11)	(0.10)	(0.10)	(0.10)	(0.11)
Return variability	2.59**	1.71***	5.05***	6.06***	5.11***	3.59***
	(1.31)	(0.50)	(0.98)	(0.87)	(0.65)	(0.73)
New-economy dummy	0.41**	0.24	0.44**	0.55***	0.56***	0.54***
	(0.20)	(0.19)	(0.19)	(0.19)	(0.15)	(0.17)
Industry dummies	+	+	+	+	+	+
Observations	527	507	495	482	488	543
Adjusted R^2	54%	53%	63%	63%	65%	51%

TABLE 4: PAY AND PAST CHANGES IN SHARES OUTSTANDING

AND SALES PER SHARE

The table shows regression results of CEO compensation on corporate performance and expansion. The sample consists of firms that have CEO compensation data in the Execucomp database. In each year, we consider firms whose CEOs were not replaced in the preceding three years. Financial information is from Compustat and CRSP. The dependent variable is log compensation in year t. Compensation in any given year is defined as the sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and other compensation. Stock return is the log of the gross stock return (including dividends, net of inflation) between the end of year t-3 and the end of year t. Growth in sales per share is the difference between the log of sales per share in year t and the log of sales per share in year t-3. The rest of the variables are as defined in Table 2. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively. The intercept coefficient is omitted from the table.

	1997	1998	1999	2000	2001	2002
Changes in firm variables during the preceding three years						
Stock return (t-3 to t)	0.48***	0.23**	0.21***	0.25***	0.34***	0.31***
	(0.10)	(0.09)	(0.07)	(0.07)	(0.07)	(0.07)
Growth in shares outstanding (t-3 to t)	0.67***	0.97***	0.73***	0.71***	0.59***	0.56***
	(0.17)	(0.14)	(0.13)	(0.15)	(0.14)	(0.17)
Growth in sales per share (t-3 to t)	0.16	0.33***	0.43***	0.22***	0.32***	0.19*
	(0.10)	(0.10)	(0.09)	(0.07)	(0.08)	(0.10)
Initial firm variables						
Market cap (t-3)	0.32***	0.27***	0.32***	0.24***	0.31***	0.28***
	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)
Sales (t-3)	0.18***	0.19***	0.28***	0.33***	0.26***	0.27***
	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)
Control variables						
Industry-adjusted Q	-0.08	0.01	0.12	0.17	0.01	-0.04
	(0.13)	(0.12)	(0.11)	(0.11)	(0.11)	(0.12)
Return variability	3.16**	1.63***	4.73***	5.77***	5.20***	3.50***
	(1.35)	(0.52)	(1.00)	(0.93)	(0.68)	(0.78)
New-economy dummy	0.45**	0.31	0.46**	0.61***	0.58***	0.58***
	(0.20)	(0.20)	(0.19)	(0.19)	(0.15)	(0.17)
Industry dummies	+	+	+	+	+	+
Observations	519	506	494	474	483	539
Adjusted R^2	53%	53%	64%	64%	64%	50%

TABLE 5: CHANGES IN COMPENSATION LEVELS

The table shows regression results of changes in CEO compensation on firm performance and growth in size. The sample consists of firms that have CEO compensation data in the Execucomp database and whose CEO served in this position in the preceding three years. Financial information is from Compustat and CRSP. The dependent variable is the difference between log CEO compensation in year t and log of CEO compensation in year t-3. Compensation in any given year is defined as the sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and other compensation. Growth in Q is the difference between industry-adjusted Q in year t and industry-adjusted Q in year t-3. Growth in return variability is the difference between return variability in year t and return variability in year t-3. Stock return is the log of the gross stock return (including dividends, net of inflation) between the end of year t-3 and the end of year t. Growth in sales per share is the difference between the log of sales per share in year t and the log of sales per share in year t-3. The rest of the variables are as defined in Table 2. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively. The intercept coefficient is omitted from the table.

	1997	1998	1999	2000	2001	2002
Changes in firm variables during the preceding three years						
Stock return (t-3 to t)	0.59***	0.28***	0.25***	0.21***	0.35***	0.37***
	(0.11)	(0.09)	(0.08)	(0.07)	(0.08)	(0.07)
Growth in shares outstanding (t-3 to t)	0.65***	0.47***	0.37***	0.69***	0.41***	0.12
	(0.15)	(0.13)	(0.12)	(0.14)	(0.14)	(0.15)
Growth in sales-per-share (t-3 to t)	-0.08	0.26***	0.37***	0.23***	0.24***	0.10
	(0.09)	(0.09)	(0.09)	(0.07)	(0.08)	(0.09)
Initial firm variables						
Market cap (t-3)	0.04	-0.13**	-0.09	-0.11*	-0.07	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
Sales (t-3)	0.03	0.13**	0.19***	0.15***	0.10*	0.02
	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)
Control variables						
Industry-adjusted Q (t-3)	-0.13	0.28**	0.15	0.18	0.19*	-0.09
	(0.12)	(0.12)	(0.12)	(0.11)	(0.11)	(0.11)
Growth in Q (t-3 to t)	-0.24	0.12	0.18	0.33**	-0.09	-0.25*
	(0.18)	(0.14)	(0.13)	(0.13)	(0.15)	(0.14)
Return variability (t-3)	-0.27	0.36	0.36	2.26*	1.28	-0.04
	(0.92)	(1.02)	(1.25)	(1.18)	(0.95)	(0.94)
Growth in return variability (t-3 to t)	0.13	0.19	0.12	0.42***	0.29*	0.15
	(0.15)	(0.13)	(0.15)	(0.16)	(0.15)	(0.15)
New-economy dummy	-0.07	0.29*	0.29*	0.30*	0.23	-0.05
	(0.18)	(0.18)	(0.18)	(0.18)	(0.15)	(0.15)
Industry dummies	+	+	+	+	+	+
Observations	518	506	491	474	482	538
Adjusted R^2	21%	18%	21%	31%	24%	16%

TABLE 6: TWO-YEAR AND FOUR-YEAR INTERVALS

The table shows regression results of CEO compensation (Table 4) and changes in CEO compensation regressions (Table 5), where the performance and growth variables are measured on two-year and four-year intervals. Only the coefficients of interest appear in the table. The sample consists of firms that have CEO compensation data in the Execucomp database. In panel A, only firms whose CEOs were not replaced in the preceding two years are considered. In panel B, we consider firms whose CEOs were not replaced in the preceding four years. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively.

PANEL A: TWO-YEAR INTERVAL

	1997	1998	1999	2000	2001	2002
Compensation level regressions						
Growth in shares outstanding	0.92***	0.87***	0.53***	0.70***	0.53***	0.45**
(t-2 to t)	(0.18)	(0.14)	(0.13)	(0.15)	(0.17)	(0.21)
Growth in sales-per-share	0.09	0.43***	0.27***	0.25***	0.25***	0.30***
(t-2 to t)	(0.11)	(0.09)	(0.08)	(0.07)	(0.09)	(0.10)
Change-in-compensation regressions						
Growth in shares outstanding	0.46***	0.28**	0.45***	0.51***	0.22	0.03
(t-2 to t)	(0.16)	(0.13)	(0.14)	(0.14)	(0.16)	(0.19)
Growth in sales-per-share	0.06	0.26***	0.23***	0.18**	0.08	0.08
(t-2 to t)	(0.10)	(0.09)	(0.09)	(0.07)	(0.08)	(0.09)

PANEL B: FOUR-YEAR INTERVAL

	1998	1999	2000	2001	2002
Compensation level regressions					
Growth in shares outstanding	0.79***	0.87***	0.67***	0.57***	0.71***
(t-4 to t)	(0.16)	(0.13)	(0.14)	(0.14)	(0.15)
Growth in sales-per-share	0.29***	0.45***	0.51***	0.24***	0.20**
(t-4 to t)	(0.11)	(0.10)	(0.10)	(0.09)	(0.10)
Change-in-compensation regressions					
Growth in shares outstanding	0.70***	0.59***	0.32**	0.36**	0.43***
(t-4 to t)	(0.14)	(0.12)	(0.14)	(0.16)	(0.15)
Growth in sales-per-share	0.19*	0.46***	0.45***	0.25***	0.15
(t-4 to t)	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)

The table shows regression results of CEO compensation (Table 4) and changes in CEO compensation regressions (Table 5), where instead of growth in sales-per-share and sales coefficients, we use the growth in asset-per-share and asset coefficients. The performance and growth variables are measured over two-year, three-year, and four-year intervals. Only the coefficients of interest appear in the table. The sample consists of firms that have CEO compensation data in the Execucomp database. In panel A, only firms whose CEOs were not replaced in the preceding two years are considered. In panel B, we consider firms whose CEOs were not replaced in the preceding three years. In panel C, we consider firms whose CEOs were not replaced in the preceding four years. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively.

PANEL A: TWO-YEAR INTERVAL

	1997	1998	1999	2000	2001	2002
Compensation level regressions						
Growth in shares outstanding	0.87***	0.80***	0.49***	0.70***	0.50***	0.36*
(t-2 to t)	(0.18)	(0.14)	(0.13)	(0.15)	(0.17)	(0.21)
Growth in assets-per-share	0.13	0.49***	0.55***	0.46***	0.52***	0.31***
(t-2 to t)	(0.13)	(0.10)	(0.10)	(0.10)	(0.11)	(0.12)
Change-in-compensation regressions						
Growth in shares outstanding	0.40**	0.22*	0.40***	0.51***	0.21	0.02
(t-2 to t)	(0.16)	(0.13)	(0.14)	(0.14)	(0.16)	(0.19)
Growth in assets-per-share	-0.05	0.26**	0.53***	0.37***	0.24**	0.04
(t-2 to t)	(0.15)	(0.11)	(0.11)	(0.10)	(0.12)	(0.12)

PANEL B: THREE-YEAR INTERVAL

	1997	1998	1999	2000	2001	2002
Compensation level regressions						
Growth in shares outstanding	0.64***	0.88***	0.67***	0.67***	0.53***	0.52***
(t-3 to t)	(0.17)	(0.14)	(0.13)	(0.15)	(0.14)	(0.17)
Growth in assets-per-share	0.16	0.37***	0.53***	0.55***	0.49***	0.27**
(t-3 to t)	(0.14)	(0.12)	(0.10)	(0.10)	(0.10)	(0.11)
Change-in-compensation regressions						
Growth in shares outstanding	0.64***	0.39***	0.32***	0.67***	0.40***	0.13
(t-3 to t)	(0.15)	(0.13)	(0.12)	(0.14)	(0.13)	(0.15)
Growth in assets-per-share	-0.16	0.26**	0.49***	0.50***	0.51***	0.20*
(t-3 to t)	(0.15)	(0.12)	(0.11)	(0.10)	(0.11)	(0.10)

PANEL C: FOUR-YEAR INTERVAL

	1997	1998	1999	2000	2001	2002
Compensation level regressions						
Growth in shares outstanding		0.74***	0.72***	0.64***	0.53***	0.65***
(t-4 to t)		(0.15)	(0.13)	(0.15)	(0.14)	(0.15)
Growth in assets-per-share		0.19	0.45***	0.57***	0.50***	0.11
(t-4 to t)		(0.14)	(0.12)	(0.11)	(0.12)	(0.10)
Change-in-compensation regressions						
Growth in shares outstanding		0.66***	0.45***	0.32**	0.35**	0.36**
(t-4 to t)		(0.14)	(0.12)	(0.14)	(0.16)	(0.15)
Growth in assets-per-share		0.07	0.36***	0.59***	0.44***	0.17
(t-4 to t)		(0.13)	(0.12)	(0.12)	(0.15)	(0.12)

TABLE 8: POSITIVE VS. NEGATIVE CHANGES IN FIRM SIZE

The table shows regression results of CEO compensation (Table 4) and changes in CEO compensation regressions (Table 5), where we decompose the growth in shares outstanding and the growth in sales-per-share into negative and positive growth. The performance and growth variables are measured over two-year, three-year, and four-year intervals. Only the coefficients of interest appear in the table. The sample consists of firms that have CEO compensation data in the Execucomp database. Only firms whose CEOs were not replaced in the preceding three years are considered. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively.

Variable	1997	1998	1999	2000	2001	2002
Compensation level regressions						
Positive changes in shares outstanding (t-3 to t)	0.89***	1.07***	0.71***	0.89***	0.66***	0.59***
	(0.19)	(0.16)	(0.15)	(0.17)	(0.16)	(0.19)
Negative changes in shares outstanding (t-3 to t)	-1.15*	0.20	0.32	-0.11	-0.06	0.14
	(0.66)	(0.53)	(0.44)	(0.41)	(0.52)	(0.66)
Positive changes in sales-per-share (t-3 to t)	0.22*	0.33**	0.64***	0.45***	0.64***	0.26*
	(0.13)	(0.14)	(0.13)	(0.13)	(0.13)	(0.16)
Negative changes in sales-per-share (t-3 to t)	-0.04	0.34	0.04	0.04	0.09	0.10
	(0.25)	(0.22)	(0.19)	(0.11)	(0.11)	(0.17)
Change-in-compensation regressions						
Positive changes in shares outstanding (t-3 to t)	0.70***	0.49***	0.39***	0.71***	0.49***	0.08
	(0.16)	(0.14)	(0.14)	(0.16)	(0.15)	(0.18)
Negative changes in shares outstanding (t-3 to t)	0.15	0.78	0.13	0.61	-0.32	0.27
	(0.59)	(0.47)	(0.42)	(0.39)	(0.51)	(0.60)
Positive changes in sales-per-share (t-3 to t)	-0.04	0.08	0.42***	0.41***	0.60***	0.17
	(0.11)	(0.13)	(0.12)	(0.13)	(0.13)	(0.15)
Negative changes in sales- per-share (t-3 to t)	-0.22	0.62***	0.27	0.09	-0.03	0.02
	(0.22)	(0.19)	(0.19)	(0.10)	(0.11)	(0.16)

TABLE 9: DIVIDEND VS. CAPITAL GAIN COMPONENTNS OF STOCK RETURNS

The table shows regression results of CEO compensation (Table 4) and changes in CEO compensation regressions (Table 5), where the return is decomposed into return without dividend and dividend return. The performance and growth variables are measured over two-year, three-year, and four-year intervals. Only the coefficients of interest appear in the table. The variables in parentheses are the estimated standard deviations of the coefficients. The symbols *,**,*** represent statistical significance at the 10%, 5% and 1% levels respectively.

Variable	1997	1998	1999	2000	2001	2002
TWO-YEAR INTERVAL						
Compensation level regressions						
Return without dividends	0.48***	0.24***	0.26***	0.23***	0.32***	0.27***
(t-2 to t)	(0.10)	(0.08)	(0.07)	(0.05)	(0.07)	(0.07)
Dividend return	-0.18	-4.00	-2.23*	-1.40	-3.79***	-4.65***
(t-2 to t)	(0.82)	(1.30)	(1.31)	(1.08)	(1.07)	(1.21)
Change-in-compensation regressions						
Return without dividends	0.41***	0.36***	0.22***	0.40***	0.45***	0.30***
(t-2 to t)	(0.11)	(0.09)	(0.08)	(0.06)	(0.08)	(0.07)
Dividend return	1.27*	1.80	-0.67	1.25	-0.10	-0.35
(t-2 to t)	(0.72)	(1.29)	(1.31)	(1.06)	(1.05)	(1.15)
THREE-YEAR INTERVAL						
Compensation level regressions						
Return without dividends	0.48***	0.23***	0.20***	0.24***	0.34***	0.34***
(t-3 to t)	(0.10)	(0.09)	(0.07)	(0.07)	(0.07)	(0.07)
Dividend return	0.16	-1.10	-1.75*	-0.50	-0.63	-3.23***
(t-3 to t)	(1.03)	(0.74)	(1.05)	(0.97)	(0.92)	(0.85)
Change-in-compensation regressions						
Return without dividends	0.59***	0.28***	0.24***	0.20***	0.35***	0.37***
(t-3 to t)	(0.11)	(0.09)	(0.08)	(0.07)	(0.08)	(0.07)
Dividend return	1.99**	0.21	-0.31	-0.22	0.35***	-0.50
(t-3 to t)	(0.90)	(0.68)	(1.00)	(0.92)	(0.08)	(0.83)
FOUR-YEAR INTERVAL						
Compensation level regressions						
Return without dividends		0.39***	0.18**	0.24***	0.41***	0.42***
(t-4 to t)		(0.10)	(0.09)	(0.07)	(0.09)	(0.07)
Dividend return		-1.13	0.09	0.43	0.67	-1.13
(t-4 to t)		(0.86)	(0.72)	(0.93)	(0.92)	(0.84)
Change-in-compensation regressions						
Return without dividends		0.46***	0.14*	0.22***	0.48***	0.41***
(t-4 to t)		(0.11)	(0.08)	(0.08)	(0.11)	(0.08)
Dividend return		0.83	0.61	0.01	0.77	1.04
(t-4 to t)		(0.85)	(0.64)	(0.91)	(1.03)	(0.88)