What can we learn from small firms about executive compensation?

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Abstract

This study examines the determinants of CEO compensation using data from a nationally representative sample of non-publicly traded U.S. corporations. We find that: (i) the pay-size elasticity is much larger for small privately held firms than for the large publicly traded firms on which previous research has almost exclusively focused; (ii) executives at C-corporations are paid significantly more than executives at S-corporations; (iii) executive pay is inversely related to CEO ownership; (iv) executive pay is inversely related to debt-service coverage; and (v) executive pay is related to a number of CEO characteristics, including age, education and gender. Executive pay is inversely related to CEO age and positively related to educational attainment. Finally, female executives are paid significantly less than their male counterparts.

Key words: Compensation; Organizational Form; Taxes; Ownership; Education; Gender.

JEL classification: H24; H25; G32; J33

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1. Introduction

CEO compensation has been a subject of increasing debate as pressures for managerial accountability have mounted. Instances of huge cash payments and lucrative stock options have called into question the basis on which boards of directors determine CEO pay packages. Numerous studies have focused on determining factors which could affect CEO pay (e.g., Murphy, 1986, 1999). Despite a surge in research on CEO compensation, there is little empirical research examining how organizational form, taxation and CEO characteristics (including ownership, education and gender) are related to CEO compensation. Also, with few exceptions, previous researchers have focused on large firms that are required to file information on compensation with regulators.

In this paper, we extend the literature by examining the determinants of CEO compensation using data from a nationally representative sample of small businesses. By focusing on a sample of small firms, we can overcome problems associated with measuring compensation and assigning compensation to a given period because the CEOs in the sample are unlikely to have stock-based compensation in their compensation packages and their annual compensation consists of salary and bonus. This is partly due to their size and privately held status and partly due to the fact that stock-based compensation was less popular in early 90s, even among large publicly traded corporations (see Murphy, 1999).[1] Another feature of the sample is that none are publicly traded, although some are large enough to go public.

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[1] For firms that were publicly traded during 1994, we examined proxy statements and found that no firms with less than $10 million in total assets had stock option plans and that only one percent of firms with assets in the $10-$100 million range had stock option plans.

Focusing on a sample of small firms enables us to examine the influence of market factors on CEO compensation (e.g., size, industry, performance, etc.). This situation obtains because the dominant stock ownership by small-firm CEOs insulates their compensation from political process (i.e., board of directors and outside block holders)--the process which stands at the heart of agency framework (e.g., Jensen and Meckling, 1976; Fama, 1980). In contrast to the larger firms analyzed by other researchers (e.g., Murphy, 1985), the average stock ownership by CEOs in our sample is 66%, with about a third of all CEOs owning 50%, and another third owning 100%. Being private also insulates them from regulatory pressures due to disclosure.

The study is important for at least four reasons. First, the CEO-pay, firm-size elasticity has been explored by previous researchers, but only at large, publicly traded firms. Second, little is known about the role of organizational form and taxes in relation to CEO compensation. Third, determinants of CEO compensation at small firms are poorly understood because of the lack of research in this area. Fourth, the relationship between CEO compensation and CEO characteristics such as age, education and gender has received little attention in the literature, especially at privately held firms with high concentration. In this study, we shed new light in each of these four areas.

Our results are based upon three data sets. The first data set is the 1993 National Survey of Small Business Finances (NSSBF), a general-purpose survey of small firms co-sponsored and co-funded by the Federal Reserve Board and the U.S. Small Business Administration. Our second and third data sets are Standard and Poor's ExecuComp database, from which we obtain compensation data, and Standard and Poor's Compustat database, from which we obtain financial data, for publicly traded U.S. corporations.

We report five main results. First, we find that the pay-size elasticity is much larger for

small privately held firms than for the large publicly traded firms on which previous research has almost exclusively focused. We speculate that the lower sensitivity at large public firms results from the public observability of CEO pay at listed firms coupled with the process by which their Boards of Directors use observable pay comparables recommended by compensation consulting firms in deciding upon compensation packages.

Second, we find that executives at C-corporations are paid significantly more than executives at S-corporations.[2] This finding supports our hypothesis that, at C-corporations, executive pay enables CEOs to avoid double-taxation of income that normally would be distributed as dividends. S-corporations face no double taxation, as all income--salary and dividends--flows through the firm without taxation to the owner's personal income. However, we do not expect that C-corporation CEOs have complete discretion to substitute compensation for dividends because of IRS limitations on "excessive compensation."

Third, we find that executive pay is related to the firm's ownership structure. Specifically, pay is inversely related to CEO ownership at both C- and S-corporations, but this effect is stronger at C-corporations. We expect this relationship because CEO's preference for salary income over dividend income is inversely related to his ownership share. At S-corporations, where there is no corporate tax, each dollar of gross profits distributed as salary is worth more than each dollar of gross profits distributed as dividends because the CEO receives all of the salary but only α% of the dividends, where ($\alpha < 100$%) is the CEO's ownership

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[2] An S-corporation is similar to C-corporation in that its shareholders enjoy limited liability, but is different in that it is exempt from corporate taxation and, at the time of the survey, had to have less than 75 shareholders, only one class of stock, and no foreign or corporate shareholders. Beginning in 1996, the limitation on the number of shareholders was increased to 95.

percentage.[3] At C-corporations, this effect is magnified by the corporate tax. In effect, it is "cheaper" to compensate the CEO directly through salary than indirectly through dividends because other shareholders also must receive their pro-rata distribution of the firm's cash flow.

Fourth, we find that executive pay is inversely related to leverage as measured by the ratio of total debt to total assets. It is not uncommon for lenders to include loan covenants that restrict compensation levels and cash distributions unless certain debt coverage and other ratios are met. In addition, CEOs may adjust their compensation so as to reduce the likelihood of default on firm debt obligations.[4]

Fifth, we find that executive pay is related to a number of CEO characteristics, including age, education and gender. We find a quadratic relationship between executive pay and CEO age, with pay reaching a maximum at age 55 and then declining. This is consistent with at least two explanations. Older executives tend to be more conservative and risk-averse, so they would prefer to leave earnings in the firm rather than extract them through salary. According to the life-cycle consumption hypothesis, older executives require less current income to meet their consumption needs so they would be more likely to leave earning in the firm, where they could grow tax-free, rather than extract them as taxable salary.

We also find that executive pay is positively related to educational attainment. CEOs with a four-year college degree earn significantly more than those with less than a four-year degree, and CEOs with a graduate degree earn significantly more than those with a four-year degree. These findings are consistent with the literature regarding the effect of education on

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[3] At $\alpha=100\%$, a dollar of salary would be exactly equivalent to a dollar of dividends for an S-corporation.

[4] We speculate that lenders offer lower interest rates on borrowed funds when there is a smaller commitment of cash flow to CEO compensations.

earnings capacity (see, e.g., Card 1999).

Finally, we find that female executives are paid significantly less than their male counterparts. This is consistent with Bertrand and Hallock (2001) who document a pay disparity between male and female executives at firms covered by ExecuComp, but is especially interesting, given the substantial input that CEOs of small firms have in determining their own pay structure.[5] We speculate that relative risk aversion may play a role here.[6]

The paper is organized as follows. In Section 2, we discuss some important properties of CEO compensation. In Section 3, we describe our data and methodology. We present the empirical results in Section 4, followed, in section 5, by a summary and conclusions.

2. Properties of CEO compensation

The search for the determinants of the level of CEO compensation has evolved as a corollary to the neoclassical versus managerialist debate about the pattern of corporate behavior (see Rosen (1982) for an early discussion and Murphy (1999) for more recent findings). For example, Murphy (1985) has demonstrated that changes in CEO compensation are a positive function of changes in sales, even after controlling for the value of the firm. Baker, Jensen, and Murphy (1988) point out that this suggests that CEOs can increase their pay by increasing firm size, even when the increase in size reduces the firm's market value. They also state that the best documented empirical regularity regarding levels of CEO compensation is an elasticity with respect to firm sales of about 0.3, and that this regularity is remarkably stable across industries.

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[5] See Blau and Kahn (2006) for a survey of the literature on gender and pay.

[6] Huberman and Wei (2006) find that women make significantly larger contributions to their 401K plans, suggesting greater risk aversion. Greater relative risk aversion also could explain the lower CEO compensation we find in our analysis.

Murphy (1999), however, points out that this relationship "has weakened over time." He further argues that sales remains the primary pay benchmark recommended by compensation consulting firms, although market capitalization, total assets and number of employees also are used, especially for start-up ventures. He notes that both sales and market capitalization are often conflated with performance.

Murphy (1986) investigates whether CEOs are better characterized as employees or entrepreneurs. He notes that CEOs on average hold only about 0.1% of their firm's common stock as evidence of the implausibility of treating managers as residual claimants. At the same time, he argues that CEOs are not conventional employees because executives, especially those with large share holdings, undoubtedly have a much larger influence on the size and composition of their paycheck than lower level workers.

Scholes and Wolfeson (1992) argue that corporate managers devise strategies to minimize the burden of corporate taxes. The incentive to engage in tax-avoidance activities is greater when the CEO has a larger ownership stake in the firm. In addition, the CEO has incentive to minimize the burden of personal taxes. The combined incentives from corporate and personal taxes will have differential effect depending upon the organizational form of the firm.

At C-corporations, dividend income is taxed at the both the corporate and personal levels whereas salary compensation, which is a deductible expense for the corporation, is not. Hence, CEOs of C-corporations can reduce the combined effects of corporate and personal taxation by taking compensation in the form of tax-deductible expense items, such as compensation, interest, rent, and royalties paid to the CEOs, rather than in the form of dividend income.

At S-corporations, CEOs are not concerned with corporate taxation because such firms are taxed as pass-through entities while retaining many of the non-tax advantages of the corporate form.[7] Stockholders of S-corporations report their pro-rata share of income as well as loss on their personal income tax return. Hence, dividend income is taxed only once, at the personal level. Consequently, CEOs of S-corporations are indifferent between salary and dividend income from a taxation perspective.[8] All else being equal, we expect CEO pay to be higher at C-corporations than at S-corporations.

In addition, we expect CEO ownership to affect this relationship between organizational form and CEO pay. While a CEO may be indifferent between salary and dividend income, the firm has a clear preference for compensating its CEO using salary expense because dividends must be distributed on a pro-rata basis. So long as the CEO owns less than 100% of the firm, it will cost the firm more than $1.00 to provide the CEO with $1.00 in compensation via dividend payments. Although the CEO of an S-corporation can take money out of the firm at any time without adverse tax consequences, doing so through a distribution of dividends will be more costly to the firm than doing so through salary payment because all shareholders, not just the CEO, must receive a share of the dividend distribution in proportion to their ownership stake. For example, if the CEO holds 25% of the firm's shares, the firm must distribute an additional

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[7] Of course, the most prominent advantage of the corporate form of organization over partnerships and proprietorships is limited liability, whereas investors' liability is limited to the amount of their equity investment. Owners of partnerships and proprietorships face unlimited liability. There are other organizational forms which enable shareholders to avoid taxes (see chapter 4 of Scholes and Wolfson (1992)).

[8] While many states conform to federal treatment, some do not follow the federal treatment of S-corporations, with some applying a tax surcharge to burden S corporations at a corporate rate when the individual rates are substantially lower. Moreover, if a company has any significant foreign operations, other nations may not recognize the pass-through status of S-Corporations. For a number of non-tax reasons, S-Corporations are unusual in the international arena.

$4.00 in dividends if it is to channel an additional $1.00 to the CEO, whereas it must pay only $1.00 in additional salary to achieve the same result. At C-corporations, this effect is magnified by the ability of the firm to deduct salary expense but not dividend expense, i.e., the double taxation at the corporate level makes it even more costly to channel an additional dollar to the CEO through distribution of dividends.

Therefore, all else equal, we expect that CEO pay is an inverse function of CEO ownership because it is more costly to compensate a CEO via dividend distributions as ownership declines. Moreover, we expect that this effect is more pronounced at C-corporations because of the double taxation of dividends.

Jensen and Meckling (1976) and Amihud and Lev (1981), among others, have suggested that CEOs undertake corporate decisions in order to reduce the probability of financial distress and improve their job security. One such decision is to adjust their compensation, which, we argue, is even more critical for small firms. It is likely that CEOs would adjust how much they extract in pay so as to reduce the probability of financial distress. In addition, banks and other lenders to small firms often include loan covenants limiting payments to insiders or requiring maintenance of minimum debt coverage ratios. For both of these reasons, we expect that CEO pay declines with the firm's debt coverage ratio.

Finally, there is a broad literature on the relationship between earnings and work age, education and gender (see, e.g., Weiss 1986 and Card 1999). In general, these studies find that earnings are an increasing function of educational attainment. It is not clear that this relationship holds true for differences in the compensation packages of CEOs, but we expect that it does, especially for small privately held firms.

Regarding gender, there are numerous studies that find a significant pay differential

between men and women. Blau and Kahn (2006) provide a recent survey of this literature for

executives below the rank of CEO. Bertrand and Hallock (2001) use the ExecuComp dataset to

analyze gender differences among senior executives at listed U.S. corporations. They find that

female executives earn 45% less than their male counterparts, but that much of this difference

can be explained by firm size and executive experience. They are unable to examine CEOs

separately because of the paucity of female CEOs in the ExecuComp data. In our data, we do

have sufficient incidence of female CEOs to conduct such an analysis. Other things equal, we

expect that female CEOs earn less than their male counterparts.

Regarding age, the effect of age and experience on compensation has been the subject of

much research in the labor economics literature (see, e.g., Lazear 1976, Weiss 1986, Murphy and

Welch 1990). This literature has focused on workers in general rather than senior management.

In contrast, our sample consists solely of CEOs who have been managing their firms for many

years. Their median experience as an owner or manager is 20 years, which is longer than the

median age of our sample firms, which is only 12 years. Therefore, the findings of the existing

literature may not be applicable to our sample. We hypothesize that small-firm CEO pay follows

the life-cycle hypothesis, as our CEOs in our sample have, at the very least, significant influence

on their level of pay.[9] Therefore, we expect that the level of pay rises for younger CEOs to some

maximum and then falls for older CEOs. To capture this nonlinearity, we use a quadratic

specification for age, expecting a negative coefficient on our square-of-age term and a positive

coefficient on our age term.

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[9] Murphy (1998) and others have documented that CEOs of large publicly traded firms have significant discretion in the level and form of their pay. Therefore, it is reasonable to assume that the CEOs of our small firms have even more discretion in setting their own pay.

3. Data and methodology

3.1 Data

In this study, we utilize data from three sources. The first source is the 1993 National Survey of Small Business Finances (NSSBF), which was co-sponsored and co-funded by the Federal Reserve Board and the U.S. Small Business Administration.[10] The firms surveyed constitute a nationally representative sample of 4,637 small businesses operating in the United States as of year-end 1992, where a small business is defined as a non-financial, non-farm business employing fewer than 500 full-time equivalent employees. Data include information on each firm's balance sheet; income statement (including CEO compensation); CEO characteristics, including age, education and gender; and structural characteristics, including organizational form and ownership structure.

We impose two restrictions on the NSSBF sample. First, we use information on organizational form to identify and exclude 1,829 proprietorships and partnerships from our analysis because we want to compare CEO compensation across firms of similar organizational form. Scholes and Wolfson (1989) argue that an organization's form is chosen to minimize both tax costs and transactions costs. If the corporate form of organization has a greater tax cost than that of an alternative then the corporation would not be chosen unless the transaction costs of the alternative (i.e., proprietorship or partnership) exceed those of the corporation. Because proprietorships and partnerships do not offer limited liability and easy transferability of ownership interest, they are less similar to, and thus less comparable to, corporate form of

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[10] Similar surveys were conducted for 1987 and 1998, but neither of those surveys collected information on CEO pay.

organization.[11] In addition, the transactions costs associated with partnerships may exceed that

of corporate form (see Guenther, 1992).

Second, we exclude 596 firms that did not know or refused to divulge their amount of

CEO compensation. This leaves a final sample of 2,212 of which 1,396 are C-corporations and

816 are S-corporations.

Our second and third sources of data are ExecuComp, from which we obtained CEO

compensation data, and Compustat, from which we obtain firm financial data, for firms in the

S&P500, Mid-Cap 400 and Small-Cap 600 covering the period 1992-2004, for a total of 19,113

firm-year observations. We pool data across years in order to have sufficient number of

observations to calculate pay-size elasticities for a wide range of size categories. Murphy (1999)

documents that the pay-size elasticity for these firms in relatively time-invariant, so this pooling

should not cloud comparisons with the 1993 NSSBF data. However, we also calculate

elasticities for broader grouping of firms using data only from 1992-1994. Our purpose here is to

examine whether or not the "best-documented empirical regularity" in research on executive

compensation, a pay-size elasticity of 0.3, holds true for small privately held firms. Because of

data limitations, previous research has focused exclusively on the much larger public firms that

are included in the ExecuComp database.

3.2 Methodology

To analyze the determinants of CEO compensation at small businesses, we first analyze

univariate statistics for our analysis variables—total assets; total sales revenues; total full-time

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[11] Some variations of partnerships offer some, but not all, the advantages of the corporation. For
example, the limited partners in a limited partnership enjoy limited liability, although the general
partner does not. And partners in a master limited partnership can readily transfer ownership
interests. Most like the corporation is the limited-liability partnership, but, at the time of the
NSSBF, there were fewer than 10,000 such firms nationwide, so they are unlikely to be represented

equivalent employees; debt to assets; firm age; firm organizational form dummy (C-corporation vs. S-corporation); CEO stock-ownership percentage, age, education and gender; and dummy variables indicating each firm's one-digit SIC code. This enables us to characterize the representative small business and to identify potential outliers in the data. Second, we explore the pay-size elasticities for different sizes of firms by regressing the log of executive pay against the log of annual firm sales. Third, we use ordinary-least-squares regression to analyze the potential determinants of CEO compensation in a multivariate framework using the following model:

$$ln\,(CEO\ Compensation_i) = \beta'X_i + \varepsilon_i \qquad\qquad (1)$$

where: $ln\,(CEO\ Compensation_i)$ is the natural logarithm of the dollar value of CEO compensation and X_i is a vector of firm- and CEO-specific explanatory variables. Included in this vector are: size as measured by natural logarithm of annual sales revenues; the natural logarithm of firm age; a dummy variable indicating that the firm is organized as a C-corporation rather than as an S-corporation; leverage as measured by the ratio of total debt to total assets; the percentage of the firm's stock owned by the firm's chief executive officer; CEO education as measured by dummy variables indicating the CEO's highest educational attainment (high-school, some college, a college degree or a graduate degree); the natural logarithm of CEO age; a dummy variable indicating that CEO gender is female; and a set of nine zero-one dummy variables indicating the firm's one-digit SIC code;[12] and ε_i is a normally distributed error term.

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in the sample by more than a handful of firms (see Cole and Wolken, 1995).

[12] We split wholesale and retail firms, SIC codes 50-51 and 52-59, respectively, into two separate categories.

4. Empirical results

4.1. Sample characteristics

Panel A of Table 1 shows the distribution of CEO compensation at small U.S. firms by annual sales quartiles for all NSSBF sample corporations and separately for C-corporations and S-corporations. The results for all firms (column 3) clearly show a positive relationship between firm size and CEO compensation, with the latter rising from $36,600 in the smallest quartile, to $87,700 and $193,800 in the middle quartiles, and to $453,800 in the largest quartile. Table 1 also shows that CEO compensation is significantly higher at C-corporations than at S-corporations ($120,600 versus $856,300), and that this differential increases with firm size. In the smallest quartile the difference is only $3,900 or slightly more than 10 percent of the quartile's average S-corporation pay, whereas in the largest quartile the difference is $35,300 or more than 40 percent of the quartile's average S-corporation pay.

Panel B of Table 1 presents the distribution of S-corporations and C-corporations with each of the Sales quartiles for the full sample. Contrary to our expectations, we do not see that C-corporations are disproportionately represented in the largest quartile while S-corporations are disproportionately represented in the smallest quartile. Instead, both are relatively evenly distributed, suggesting that the size distribution of the two types of corporations is relatively homogenous.

Table 2 presents the descriptive statistics for the NSSBF variables used in this study. For expositional purposes, these statistics are for the original variables rather than for the logarithmic transformations. The average firm in the sample paid its CEO $107,000; generated $2.158 million in annual sales revenues; and had an interest coverage ratio of 0.084. C-corporations account for 61.6% of the sample. The average firm's CEO owned 69.8% of the firm's stock, was 49.6 years old and was male. Just over 20% of CEOs held a graduate degree, with 34% holding a four-year college degree and another 21% having some college education. Only 16.5% of CEOs were female.

Table 2 also shows descriptive statistics separately for the subsamples of 816 S-corporations and 1,396 C-corporations. These statistics show that S-corporations are significantly smaller than C-corporations in terms of annual sales ($1.9 million versus $2.3 million) and significantly younger (13.2 years versus 16.9 years).

4.2. Pay-Size Elasticity

In Tables 3 and 4, we explore the "best documented empirical regularity regarding levels of CEO compensation," the pay-size elasticity of 0.3. We estimate elasticities as the coefficient of the natural logarithm of firm size (β_1) obtained from the following regression:

$$ln\ (CEO\ Pay_{i, t}) = \beta_0 + \beta_1 * ln\ (Size_{i, t}) + \varepsilon_{i, t} \qquad (2)$$

where $ln\ (CEO\ Pay_{i, t})$ is the natural logarithm of CEO Pay at firm i during year t; $ln\ (Size_{i, t})$ is the natural logarithm of annual sales, total assets or total employment for firm i in year t; and $\varepsilon_{i, t}$ is an i.i.d. error term.

In Table 3, we report elasticities based upon pooled cross-sectional and time-series data from ExecuComp covering the period from 1992-2004. This enables us to analyze elasticities across relatively small size buckets. We break the sample into quartiles by each size measure, and then further break down the smallest quartile into three buckets, the smallest 5% of firms, firms in the 5%-10% quantiles, and firms in the 11%-15% quantiles.[13]

When we measure size by annual sales using the ExecuComp data, we cannot reject a pay-size elasticity of 0.3 for the three largest sales quartiles, where the elasticities are 0.319 (standard error = 0.013), 0.281 (standard error = 0.027) , and 0.356 (standard error = 0.030). However, this relationship breaks down for the smallest quartile, where the elasticity is only 0.16 (standard error = 0.009). When we break the smallest quartile into smaller quantiles (10%-25%, 5%-10% and 0%-5%), we see that the relationship holds for firms above the smallest decile. The elasticity in the 10%-25% bucket is 0.27 (standard error = 0.040), but falls to 0.17 (standard error = 0.12) for firms in the 5%-10% quantiles and to 0.04 (standard error = .020) for firms in the 0%-5% quantiles.

When we measure size by total assets using ExecuComp data, we find similar but more variable results. The elasticities for the four quartiles (by declining size) are 0.277, 0.209, 0.365 and 0.257. As with sales, this relation breaks down for the smallest 5% of firms, where the elasticity falls to 0.15 (standard error = 0.030).

When we measure size by total employment using ExecuComp data, we find elasticities for the four quartiles by (declining size) of 0.274, 0.412, 0.393 and 0.457. Here, the relationship

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[13] For robustness, we also estimated and analyzed elasticities based upon data from only the years 1992-1994. The compensation data from this much shorter period should be more comparable to the data in the 1993 NSSBF, although Murphy (1998) provides evidence that the pay-size elasticities are relatively time-invariant. Our results largely confirm Murphy's findings.

breaks down for firm in the 0%-5% and 5%-10% category, where the elasticities are not statistically different from zero.

Overall, the ExecuComp data are broadly supportive of a pay-size elasticity of 0.3 only for the largest quartile of firms, which have been the subject of most previous research. For smaller firms, the results are less conclusive and, for the smallest decile of firms, this relationship appears to break down completely. Hence, our findings are somewhat at odds with Baker, Jensen, and Murphy (1988), who state that "the best documented empirical regularity regarding levels of executive compensation is an elasticity of compensation with respect to firm sales of about 0.3" and that "the correlation between sales and compensation is very high." They attribute the apparent stability of this elasticity across time and industries to "the substitution (by boards of directors) of a mechanical pay/sales relationship" for job evaluation plans. We speculate that this relationship breaks down for smaller firms, where the boards are less likely to hire pay consultants and use industry/size comparables in setting CEO pay.

We also calculate the pay-size elasticities for NSSBF firms using the same three size metrics. When we measure size by annual sales, we find that the pay-size elasticity for the full sample is 0.52, two-thirds larger than the 0.30 average for the ExecuComp sample. Thus, it appears that the pay-size elasticity of small private firms is significantly greater than that of large public firms.

By looking at the largest of the NSSBF firms, we can shed some light on the private vs. public distinction between the NSSBF and ExecuComp firms. If we analyze only the top quartile of NSSBF firms, we obtain results for a group of 546 relatively large (greater than $6.3 million in annual sales) private firms that we can then compare with results for the smallest of

the ExecuComp firms. For these 546 NSSBF firms, we obtain a pay-size elasticity of 0.475

(standard error = 0.063), not statistically different than the 0.52 elasticity for the full NSSBF

sample. This is almost double the 0.27 pay-sales elasticity for the smallest quartile of

ExecuComp firms, and multiples larger than the 0.04 pay-sales elasticity for the smallest 5% of

ExecuComp firms. Hence, it appears that the pay-sales elasticity is much stronger at the largest

privately held firms than at smallest of publicly traded firms.

The pay-sales elasticities for smaller private firms also are much larger than those for

public firms. For the smaller three quartiles by declining size, the elasticities are 0.734, 0.887

and 0.449. Each of these is significantly larger than the elasticities for public firms, large or

small.

When we measure size by total assets or total employment instead of annual sales, the

results for the NSSBF sample are remarkably consistent. Within each the three largest quartiles,

none of the three pay-size elasticities are significantly different from each other. For the smallest

quartile, the pay-asset elasticity of 0.270 is significantly smaller than the 0.449 pay-sales

elasticity and the 0.480 pay-employment elasticity. We also find that the pay-size elasticities are

larger for the two middle quartiles than for the largest and smallest quartiles, regardless of the

size measure.

In Table 4, we investigate whether these elasticities are stable across industries for small

businesses by regressing compensation against sales for each of our nine industry groups.

This table shows that the elasticity of compensation with respect to sales varies widely across

industries in contrast with the reported stability for larger firms. The reported elasticity for each

industry is significantly greater than 0.3, and range from 0.48 for wholesale trade firms to 0.73

for professional services firms. These findings suggest that the elasticity of compensation with

respect to sales is consistently greater and more variable for small non-publicly traded firms than for larger corporations.

In Table 5, we use multivariate regression to analyze the determinants of CEO pay at small firms. We analyze six different specifications that include various combinations of firm characteristics, CEO characteristics and industry control variables. This enables us to provide evidence regarding the relative importance of these variables in explaining CEO pay at small firms.

We begin with a simple model that includes only firm size, the model used to obtain the pay-size elasticity for the full NSSBF sample reported in Table 3. We see that this coefficient of 0.52 is estimated with great precision as evidenced by its associated t-statistic of 37.00. By itself, size explains more than 38 percent of the variability in CEO pay.

In specification (2), we include additional firm characteristics: leverage as measured by the ratio of debt to assets, the natural log of firm age, a dummy variable identifying C-corporations and the ownership share of the CEO. Each of these variables is statistically significant at better than the 0.05 level and all but ownership are significant at better than the 0.01 level.

CEO pay is inversely related to ratio of debt to assets. The -0.20 coefficient implies that CEO pay declines by 0.2 percent for each one percentage point increase in the debt-to-asset ratio, supporting our hypothesis that CEOs enhance their job security by extracting less pay as leverage increases. CEO pay is 16% higher at C-corporations than at S-corporations. This finding supports our hypothesis that double taxation of income at C-Corporations leads their managers to prefer salary compensation over dividend income. CEO pay declines with CEO ownership, falling by 2.0 percent for each 10 percentage point increase in CEO ownership. This

is consistent with our hypothesis that distributing income to a CEO through a dividend becomes more costly to the CEO as her ownership share increases. This cost is borne by CEOs of both types of corporations but is higher for CEOs of C-corporations because of the double taxation issue. CEO pay declines significantly with firm age but the magnitude is extremely small. Adding the four firm characteristics to firm size improves the explanatory power of the model only slightly, from an adjusted R-square of 38.2% to 39.4%.

In specification (3), we analyze a set of three CEO characteristics: age, gender and educational attainment, which are measured by a set of dummy variables—graduate degree, college degree and some college, with the omitted category being high school or less. We utilize a quadratic specification for CEO age to capture our hypothesized nonlinearity. Our results support the nonlinear specification, with a significant negative age-square and a significant positive age term. We run an additional regression including only the age- and age-square terms in order to find the age of maximum CEO pay (not shown). This regression reveals that CEO pay for small privately held corporations reaches a maximum value at an age of 55 years.[14]

We also find that CEO pay is significantly lower for females and increases with educational attainment. Female CEOs earn 46% less than their male counterparts, after adjusting for age and education. CEOs with college degrees earn 36% more, while CEOs with graduate degrees earn 76% more, than CEOs with a high-school degree or less. Together, these CEO characteristics explain approximately eight percent of the variability in CEO pay.

In specification (4), we combine the firm characteristics with the CEO characteristics. For the most part, the results from specifications (2) and (3) hold up, with each variable maintaining its sign and statistical significance except for the log of firm age. The reduced

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[14] The coefficients from this regression correspond to a quadratic equation. Taking the first

significance of firm age is likely due to collinearity with CEO age, as they are highly correlated

(pearson product-moment coefficient = 0.44). The coefficient for gender declines from −0.46 to

−0.20, underlining the importance of firm control variables in any analysis of gender and

compensation. This specification explains approximately 44 percent of the variability in CEO

pay.

In specification (5), we add a set of industry controls in the form of nine dummy

variables indicating one-digit standard industrial classification. Individual coefficients are not

shown, but several are significant at better than the 0.01 level and their coefficients show

considerable variation. The magnitude on the coefficient for gender falls to -0.18, which

indicates that female CEOs earn 18 percent less than their male counterparts after controlling for

all of the other variables in this specification. It is important to note that Bertrand and Hallock

(2001) found that less than one percent of the ExecuComp sample were either CEO or Chairman

of their firms so they were unable to perform a meaningful analysis of gender differences within

this group. For executives at all levels, they found that females constitute 2.5 percent of the

sample and earned 9% less than their male counterparts after controlling for firm size, CEO age,

experience and position (i.e., CEO/Chair, CFO, EVP, VP, etc).[15] In our sample, more than 16

percent of the firms are headed by a female CEO. Adding industry controls improves the

explanatory power of our model to 49 percent.

Finally, in specification (6), we test whether the effect of CEO ownership is greater for

C-corporations than for S-corporations as predicted by our hypothesis. We interact CEO

ownership with two dummy variables, one indicating S-corporations and one indicating C-

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derivative and setting it equal to zero, we solve for the implied maximum value of age.
[15] We also tested specifications including CEO experience in place of and in addition to CEO
age. The results are not qualitatively affected. Experience is not significant when added to age,

corporations. The results show that the negative coefficient for C-corporations is greater in magnitude than that for S-corporations, indicating that the effect of CEO ownership on CEO pay is more pronounced at C-corporations, consistent with our hypothesis that double taxation of C-corporation increases the divergence between compensation via salary versus dividend distributions. However, this difference is not statistically significant.

5. Summary and conclusions

In this study, we extend the literature on CEO compensation by analyzing determinants of CEO compensation at small privately held corporations. Our new evidence is important because differences in the ownership and governance structures of small and large firms suggest that determinants of CEO compensation also should differ.

We find that we can explain almost half of the variability in CEO compensation at small firms. By far, the most important determinant of CEO pay is firm size as measured by annual sales. We find that the pay-size elasticity at small privately held firms is 0.5, two-thirds larger the 0.3 elasticity documented by previous researchers at public firms. We also find that the previously documented 0.3 pay-size elasticity does not hold for the smallest of public firms, i.e., those with less than $1 billion in assets. Previous researchers had not examined these smaller ExecuComp firms separately. We speculate that this difference in pay-size elasticity between small private and large public firms results from the reliance of pay comparables and consultants by the compensation committees and boards of the large public firms. While this reliance may insulate the board from public criticism about the level of executive pay, Warren Buffett, among others, has questioned the merit of such benchmarks as opposed to linking pay to measures of

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and is significant with the same qualitative values when in place of age and age squared.

firm performance. It is likely that smaller listed and unlisted firms do not employ pay consultants and rely less upon compensation benchmarks, leading to the greater correlation between pay and performance.

We speculate that the strong pay elasticity with respect to firm sales at privately held firms represents a pay-performance rather than a pay-size relationship because private firms rely much more heavily upon sales to measure performance in the absence of market values. In addition, owners of private firms have much flexibility in taking profits in the form of expenses, which renders profitability a much less reliable indicator of performance for small firms.

We also find that executives at C-corporations are paid significantly more than executives at S-corporations. This finding supports our hypothesis that, at C-corporations, executive pay enables CEOs to avoid double-taxation of income that normally would be distributed as dividends

Third, we find that executive pay is related to the firm's ownership structure. Specifically, pay is inversely related to CEO ownership at both C- and S-corporations, but this effect is stronger at C-corporations. These findings result from the fact that it is "cheaper" to compensate the CEO directly through salary than indirectly through dividends because other shareholders also must receive their pro-rata distribution of the firm's cash flow and, at C-Corporations, this effect is magnified by the double-taxation of corporate earnings.

Fourth, we find that executive pay is inversely related to leverage as measured by the ratio of total debt to total assets. This finding suggests that executives adjust their compensation in order to minimize the likelihood that a corporation will default on its debt obligations.

Finally, we find that executive pay is related to a number of CEO characteristics, including age, education and gender. We find a quadratic relationship between pay and age. Pay

rises with age until a CEO reaches age 55, and then declines. Pay is significantly higher for better educated CEOs, with graduate degrees providing a 78% premium and college degrees providing a 37% premium over a high-school degree. These findings are consistent with the literature on education and earnings. Pay is significantly lower for female CEOs, even though these CEOs have substantial input in determining their pay packages. We speculate that relative risk aversion may play a role.

Left unanswered because of data availability are a number of important issues, including how much influence the CEO has in determining her pay package, how the boards of small firms go about setting compensation (e.g., do they seek out market comparables in setting pay, as at larger firms?), and how do pay practices differ at the larger privately held firms that may go public in their future. Also unanswered is why the pay-size elasticity at small publicly traded firms with less than $1 billion in assets fluctuate so widely between the 0.3 value documented for large firms and the 0.5 value we document for privately held firms. We leave these questions for future researchers who, hopefully, will have access to more detailed data on the governance structures of small firms.

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Table 1

Panel A
Distribution of S-Corps and C-Corps by Sales Quartile

Sales Quartile ($000)	All Obs.	Percent of All Corps	S-Corp Obs.	Percent of S-Corps	C-Corp Obs.	Percent of C-Corps
Q1: $0-$450	556	25.1%	246	30.1%	310	22.2%
Q2:$450-$1,753.5	550	24.9%	184	22.5%	366	26.2%
Q3:$1,753.5-$6,377.86	553	25.0%	185	22.7%	368	26.4%
Q4: $6,377.86-$335,660	553	25.0%	201	24.6%	352	25.2%
Total	2,212	100%	816	100%	1396	100%

Panel B
CEO Pay by Sales Quartile and Organizational Form (S-Corp or C-Corp)

	Obs.	($000)	Obs.	($000)	Obs.	($000)	t-test
Q1: $0-$450	556	36.6 (1.53)	246	34.5 (2.25)	310	38.4 (2.07)	-1.27
Q2:$450-$1,753.5	550	87.7 (4.83)	184	73.1 (5.19)	366	94.6 (6.71)	-2.08
Q3:$1,753.5-$6,377.86	553	193.8 (11.2)	185	165.9 (13.78)	368	207.5 (15.27)	-1.75
Q4: $6,377.86-$335,660	553	453.8 (26.9)	201	408.5 (46.22)	352	476.2 (33.08)	-1.19
Total	2,212	107.0 (5.02)	816	85.3 (7.11)	1396	120.6 (6.78)	-3.43

Note: Q4 results are skewed by large outliers (2 S-Corp and 1 C-Corp)

Table 2
Descriptive Statistics

Variable	All Corps	S-Corp	C-Corp
Observations	2,212	816	1,396
CEO Pay ($000)	107.0	85.3	120.6
	(5.02)	(7.12)	(6.78)
Annual Sales ($000)	2,158	1,900	2,318
	(142.5)	(192.0)	(196.9)
Leverage (Debt to Assets)	0.400	0.428	0.382
	(.011)	(0.018)	(0.014)
C-Corporations	0.616	n/a	n/a
	(0.010)	n/a	n/a
Firm Age	15.5	13.2	16.9
	(0.27)	(0.38)	(0.36)
CEO Ownership	0.698	0.708	0.691
	(0.006)	(0.009)	(0.007)
CEO Age	49.6	48.0	50.5
	(0.24)	(0.38)	(0.30)
CEO Education			
Graduate Degree	0.204	0.164	0.229
	(0.009)	(0.013)	(0.011)
College Degree	0.342	0.37	0.324
	(0.010)	(0.017)	(0.012)
Some College	0.213	0.238	0.198
	(0.009)	(0.015)	(0.011)
High School Degree or Less	0.241	0.228	0.249
	(0.010)	(0.010)	(0.010)
CEO is Female	0.165	0.171	0.162
	(0.008)	(0.013)	(0.010)

Table 3
Pay-Size Elasticities

	ln(Sales)		ln(Assets)		ln(Employment)	
Panel A: ExecuComp	**Range Sales ($Mil.)**	**Coef.**	**Range Assets ($Mil.)**	**Coef.**	**Range Employees**	**Coef.**
Quartile 4	3,300- max	0.319 0.013	4,980- max	0.277 0.010	15,870- max	0.274 0.014
Quartile 3	1,100- 3,300	0.281 0.027	1,335- 4980	0.209 0.025	5,450- 15,870	0.412 0.036
Quartile 2	415- 1,100	0.356 0.030	440- 1335	0.365 0.026	1,900- 5,450	0.393 0.040
Quartile 1	0- 415	0.160 0.009	0- 440	0.257 0.012	0- 1,900	0.457 0.033
Smallest Quartile						
10%-25%	173- 450	0.27 0.04	124	0.310 0.050	640- 1,900	0.501 0.076
5%-10%	101- 173	0.17 0.12		0.530 0.120	347- 640	-0.535 0.403
0%-5%	0- 101	0.040 0.020	0-	0.150 0.030	0- 347	0.430 0.280
Panel B: NSSBF	**Range Sales ($000)**	**Coef.**	**Range Assets ($000)**	**Coef.**	**Range Employees**	**Coef.**
Quartile 4	6,300- max	0.475 0.063	2,315 max	0.442 0.060	62.5- max	0.505 0.079
Quartile 3	1,750- 6,300	0.734 0.110	575 2,315	0.480 0.099	22- 62.5	0.551 0.139
Quartile 2	450- 1,750	0.887 0.109	124 575	0.656 0.113	6- 22	0.727 0.133
Quartile 1	0- 450	0.449 0.049	0 124	0.270 0.048	0- 6	0.480 0.085

Table 4
Pay-Size Elasticities:
By One-Digit SIC and Size Groups
t-statistics appear in parentheses.

Industry	NSSBF All Coef	ExecuComp All Coef	ExecuComp < $500M Coef	ExecuComp > $500M Coef
All	0.520 (37.0)	0.289 (76.7)	0.115 (13.1)	0.327 (49.4)
sic1	0.574 (14.6)	0.447 (25.8)	0.311 (5.3)	0.417 (13.1)
sic2	0.630 (12.6)	0.257 (40.1)	0.098 (6.8)	0.340 (29.7)
sic3	0.651 (16.2)	0.312 (43.9)	0.193 (11.1)	0.310 (23.8)
sic4	0.544 (7.4)	0.331 (23.9)	0.280 (6.5)	0.386 (18.0)
sic51	0.500 (13.7)	0.270 (14.8)	0.104 (0.6)	0.311 (13.8)
sic52	0.562 (19.9)	0.320 (23.9)	0.299 (4.2)	0.289 (15.6)
sic6	0.393 (8.2)	0.244 (21.6)	0.030 (1.3)	0.319 (16.5)
sic7	0.664 (17.8)	0.338 (22.2)	0.230 (7.7)	0.380 (11.7)
sic8	0.709 (14.7)	0.241 (7.7)	0.045 (0.7)	0.158 (2.5)
sic9	n/a n/a	0.157 (7.4)	-0.018 (-0.6)	0.471 (15.5)

Table 5

Determinants of CEO Compensation

t-statistics appear in parentheses. a, b and c indicate statistical significance at the .01, .05 and .10 levels, respectively.

Variable	(1)		(2)		(3)		(4)		(5)		(6)	
Intercept	7.40		7.78		8.23		6.32		6.55		6.53	
	(79.87)	a	(60.29)	a	(19.30)	a	(18.38)	a	(19.93)	a	(19.45)	a
Firm Characteristics												
ln(Sales)	0.52		0.52				0.49		0.54		0.54	
	(37.00)	a	(35.54)	a			(34.82)	a	(38.49)	a	(38.44)	a
Debt to Assets			-0.20				-0.21		-0.21		-0.21	
			(-4.97)	a			(-5.40)	a	(-5.75)	a	(-5.73)	a
ln(Firm Age)			-0.09				-0.035		-0.031		-0.031	
			(-3.03)	a			(-1.10)		(-1.03)		(-1.04)	
C-Corporation			0.16				0.13		0.14		0.17	
			(3.59)	a			(2.99)	a	(3.32)	a	(1.51)	
CEO Ownership Share			-0.20				-0.23		-0.31			
			(-2.54)	b			(-2.98)	a	(-4.29)	a		
C-Corp * Ownership											-0.33	
											(-3.68)	a
S-Corp * Ownership											-0.28	
											(-2.24)	b
Owner Characteristics												
Owner Age					0.088		0.06		0.047		0.047	
					(5.24)	a	(4.53)	a	(3.77)	a	(3.76)	a
Owner Age Squared					-0.0008		-0.0006		-0.0005		-0.0005	
					(-5.00)	a	(-5.01)	a	(-4.32)	a	(-4.30)	a
Gender					-0.46		-0.20		-0.18		-0.18	
					(-6.53)	a	(-3.67)	a	(-3.35)	a	(-3.36)	a
Graduate Degree					0.76		0.61		0.30		0.3	
					(9.63)	a	(9.90)	a	(4.66)	a	(4.67)	a
College Degree					0.36		0.17		0.11		0.11	
					(5.13)	a	(3.16)	a	(2.07)	b	(2.08)	b
Some College					0.09		0.06		0.05		0.05	
					(1.20)		(0.92)		(0.93)		(0.95)	
Industry Controls	No		No		No		No		Yes		Yes	
Adjusted R-Square	0.382		0.394		0.08		0.436		0.493		0.492	