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What do we know about executive compensation at small privately held firms?

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Abstract We examine executive compensation using data from two nationally representative samples of small privately held US corporations conducted 10 years apart—in 1993 and 2003. We find that executive pay at small privately held firms increases with firm size and varies widely by industry, consistent with stylized facts about executive pay at public companies. From 1993 to 2003, inflation-adjusted executive pay declined at small privately held companies, in contrast to the run-up in executive pay at large public companies over the same period. Executive pay is higher at more complex organizations, is inversely related to CEO ownership and financial risk and is related to CEO age, education and gender.

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1 Introduction

What do we know about executive compensation at privately held firms? The answer, up until now, has been "not much." While there has been an explosion during the past two decades in the number of studies analyzing executive compensation at large publicly traded companies, there remains a virtual vacuum in research on executive pay at small privately held firms, in large part, because of the lack of publicly available compensation data. Almost all that we know about executive compensation comes from analyses of large public US corporations covered by the Exe-cuComp database; yet ExecuComp covers only the largest 1500 out of about 10,000 public US corporations and more than *five million* US corporations, public and private.

In this study, we continue efforts to fill this void by examining executive compensation and its determinants at small private US corporations, using data from two nationally representative samples of privately held US firms surveyed for the Federal Reserve Board a decade apart—in 1993 and 2003. As of 2015, these are still the *only nationally representative* data on executive compensation at small private US firms of which we are aware.

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Why should we care about compensation practices at small privately held firms? According to the US Small Business Administration, small private firms account for more than half of non-farm private-sector GDP, more than half of US private-sector non-farm employment and almost two-thirds of net job growth over the past 15 years.[1] Our study provides important new insights into how executive pay is set at small privately held corporations.

We report six main results; most are remarkably consistent across the two surveys, even though they were conducted a decade apart. First, by comparing pay across the two surveys, we find that median-inflation-adjusted CEO pay declined from 1993 to 2003. This stands in stark contrast to the more than tripling of pay at CEOs of the S&P 500 during the 1992–2001 reported by Murphy (2012).

Second, we test whether the stylized facts about executive compensation based upon research on large public firms hold true for privately held firms. We confirm that the level of pay is higher for larger private firms and varies widely by industry, even after controlling for firm size. However, we find that inflation-adjusted executive pay at privately held firms has fell during this time period—in sharp contrast to the run-up in pay documented for large public firms. We also find that that the pay-size elasticity is much larger at privately held firms than the 0.3 benchmark documented for large publicly traded firms. This also is much larger than the elasticities at the smallest publicly trade firms, for which we provide new evidence based upon hand-collected data. We speculate that the lower sensitivity at 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.

Third, we find that, among small privately held firms, 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 corporate 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."

Fourth, we find that executive pay at privately held firms 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 relation because a CEO's preference for salary income over dividend income should be inversely related to her ownership share. 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.

Fifth, we find that executive pay at privately held firms is inversely related to leverage as measured by the ratio of total debt to total assets. CEO pay reduces accounting profitability, which is a critically important variable in the loan approval process. In order to improve their firm's ability to obtain credit on favorable terms, CEOs should favor dividends over salary compensation. This is especially important for small firms, like those in our sample, where CEO pay is large relative to total profits. In addition, 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. Finally, CEOs may adjust their compensation so as to reduce the likelihood of default on firm debt obligations.

Sixth, 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.

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[1] See *Frequently Asked Questions* posted on the US Small Business Administration's Web site at: https://www.sba.gov/sites/default/files/advocacy/FAQ_March_2014_0.pdf.

[2] An S-corporation is similar to a 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 a certain number of shareholders (35 at the time of the 1993 survey; 75 at the time of the 2003 survey), only

Footnote 2 continued

one class of stock and no foreign or corporate shareholders. See Internet Appendix I in "Electronic Supplementary Material" for more information on how the limitation on the number of shareholders has changed over time.

This finding is consistent with at least two explanations. Older executives at small firms 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 also 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 find that executive pay is positively related to educational attainment. A CEO with a 4-year college degree earns significantly more than one with less than a 4-year degree, and a CEO with a graduate degree earns significantly more than one with a 4-year degree. These findings are consistent with the literature regarding the effect of education on earnings capacity (see, e.g., Card 1999).

Finally, we find that female CEOs 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 private firms have in determining their own pay structure.[3] We speculate that relative risk aversion may play a role here.[4]

We contribute to the literature on executive compensation in at least four important ways. First, we contribute to the growing literature on executive compensation at privately held firms (Cole and Mehran 1996; Ke et al. 1999; Ke 2001; Cavalluzzo and Sankaraguruswamy 2000; Wasserman 2006; Farrell and Winters 2008; Banghoj et al. 2010; Gao et al. 2012; Michiels et al. 2012). We provide the first statistical analysis of the determinants of executive pay at privately held US corporations using data from both the 1993 and 2003 SSBFs. By analyzing two nationally representative samples conducted a decade apart, we are able to establish a set of "stylized facts" about executive pay at small privately held firms. Previous researchers analyzing executive

compensation data from the SSBFs have used data from either the 1993 or 2003 surveys, but not both.

Second, we provide new evidence on executive compensation based upon data from small public companies that were hand-collected from SEC proxy statements for public firms with less than $250 million in assets. As far as we know, we are the first to analyze executive pay at these smallest of public corporations.

Third, we contribute to the literature on the role of organizational form and taxes in relation to executive compensation (Cole and Mehran 1996; Farrell and Winters 2008). We find that executive pay is higher at C-corporations than at S-corporations, consistent with the US tax treatment of profits, dividends, and compensation at these two types of corporations. (See Internet Appendix I in "Electronic Supplementary Material" for a discussion of S-corporations and C-corporations.)

Fourth, we provide new evidence on the importance of CEO characteristics such as age, education and gender in determining executive compensation. These findings add to the labor market and finance literatures (Cavalluzzo and Sankaraguruswamy 2000; Wasserman 2006; Banghoj et al. 2010) on the determinants of CEO executive pay.

The remainder of the paper is organized as follows. In Sect. 2, we review the existing literature on executive pay at privately held firms. In Sect. 3, we discuss why determinants of executive compensation should differ at public and private firms. We develop our hypotheses about determinants of executive compensation at private firms in Sect. 4, and, in Sect. 5, we describe our data and methodology. We present the empirical results in Sect. 6, followed by a summary and conclusions in Sect. 7.

2 Literature review

Like us, many of the existing studies of executive compensation at private firms analyze data from the 1993 or 2003 Survey of Small Business Finances, which are the only nationally representative samples of small privately held US firms that provide such compensation data.[5]

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

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

[5] There also are 1987 and 1998 versions of the SSBF, but neither of these versions provides information about executive pay.

Cole and Mehran (1996) analyze data from the 1993 Survey of Small Business Finances (SSBF) to provide the first analysis of executive compensation at privately held US firms. Like us, they find that CEO compensation is higher at C-corporations than at S-corporations, decreases with CEO stock ownership, increases with firm size, and varies across industries.

Cavalluzzo and Sankaraguruswamy (2000) and Farrell and Winters (2008) also examine executive compensation data from the 1993 SSBF. The former analyzes only those firms organized as C-corporations, and finds evidence that executive compensation rises with firm profits (return on assets) and sales, and is influenced by ownership structure. The latter analyzes only firms with less than 30 shareholders and finds evidence that executive pay increases with return on assets and asset turnover and declines with CEO ownership.

Like our study, Michiels et al. (2012) analyzes executive compensation data from the 2003 SSBF, but limits its analysis to a sample of C-corporations that are 100 % family-owned. It finds a significant and positive pay-for-performance relation.

In contrast to Cavalluzzo and Sankaraguruswamy (2000), Farrell and Winters (2008), Michiels et al. (2012) and Cole and Mehran (1996) report that return on assets is not statistically significant in explaining executive compensation. In unreported results, we also find an insignificant relation between return on assets and executive compensation in both the 1993 and 2003 SSBFs when we include log of sales as an explanatory variable. We do find a positive relation when we replace log of sales with log of assets, as do Cavalluzzo and Sankaraguruswamy (2000) and Farrell and Winters (2008). Michiels et al. (2012) uses the log of employment as its measure of size. In both the 1993 and 2003 SSBFs, our unreported analysis finds that the log of sales has far more explanatory power than either log of assets or log of employment, and that return on assets has no explanatory power when log of sales is included as the measure of size.

Cavalluzzo and Sankaraguruswamy (2000), Farrell and Winters (2008) and Michiels et al. (2012) also all include in their analysis firms whose manager is a paid employee. Unfortunately, inclusion of these firms confounds all variables related to the primary owner, including compensation, percentage ownership, founder status, age, education and experience. For firms with a paid manager, the ownership variables are not

the characteristics of the CEO; for firms whose manager is the largest shareholder, the ownership variables are the characteristics of the CEO. In contrast, we exclude from our sample firms that reported having a hired manager.

Two studies analyze a sample of privately held insurance companies. Ke (2001) examines how changes in tax laws affect executive compensation at private insurance companies whose managers owned large portions of the firm's stock. He finds that, when individual tax rates rose relative to corporate tax rates, these manager paid themselves less tax-deductible compensation than did managers in a control sample.

Ke et al. (1999) examines CEO pay at private and public insurance companies; they find a positive relation between pay and profitability at public, but not at private, firms. From this, they conclude that private firms do not rely upon contracts linking pay to accounting performance, but instead focus on subjective monitoring.

Wasserman (2006) analyzes data from a proprietary survey of executives for evidence in support of agency theory and stewardship theory. Like previous researchers, she finds that compensation increases with firm size. She also finds that firm founders accept lower pay, consistent with stewardship theory.

Banghoj et al. (2010) analyzes data from a proprietary survey of executive compensation at 125 privately held Danish firms, supplemented with accounting data from the Soliditet database. Like us, these authors find that executive pay is positively related to firm size, executive ownership and executive educational attainment. In contrast to many of the SSBF studies, they find that return on assets is not significant in explaining executive pay.

Several studies analyze executive compensation at very large private firms, complementing our study of smaller private firms. Bengtsson and Hand (2011) examines CEO pay at firms backed by venture capital using data from VentureOne. It finds that cash pay increases with both the quantity and quality of financing obtained by the firm. Gao et al. (2012) examines data on large privately held firms and public firms and finds that CEOs of public firms are paid significantly more than CEOs of similar private firms, but this disappears after controlling for risk, dividend policy and CEO turnover. It also reports that CEO pay is positively related to accounting performance and that the pay-performance link is much stronger at

public firms. Gao and Li (2014) also examines CEO pay at comparable-size public and private firms during 1999–2011, and finds that public-firm CEOs are paid 30 % more than CEOs of comparable private firms. Their findings are robust to a number of different control variables.

3 Reasons for differences in executive compensation at public and privately held firms

There are numerous reasons why the determinants of executive compensation should be different at privately held firms than at public firms. First, the board of directors, which sets pay at corporations, is quite different at public and private firms. At public firms, the board typically has from five to twenty member, of which a subset sit on a compensation committee that uses pay at comparably sized firms as a guide to setting compensation. At private firms, the board of directors is typically of size one—the CEO; if the board is larger, it usually consists of the CEO's family members. The implication is that the CEO of a private firm essentially sets her own pay. This also means that CEO characteristics, such as age, education and gender, should play more important roles in explaining CEO pay at private firms than at public firms.

Second, the board of directors at a public corporation represents the interests of dispersed shareholders. At private corporations, the board represents the controlling shareholder, who, on average, owns 70 % of the firm's shares, and other shareholders, who typically are family members of the CEO. One implication is that CEO pay should decrease with CEO ownership, as there is decreasing incentive to take distributions as compensation as ownership increases.

Third, public corporations are monitored by regulators, the media and large block holders of both debt and equity. In contrast, private corporations are, for the most part, unregulated and ignored by the media. The primary monitor is the banker who lends money to the firm, and often imposes loan covenants mandating minimum financial ratios and limits on distributions via dividends or executive pay. Consequently, leverage should be an important determinant of executive pay at private firms, and we should see an inverse relation between leverage and pay.

Fourth, the primary principal–agent conflict at public corporations is between dispersed minority shareholders and CEOs with tiny equity ownership percentages. In contrast, at private corporations, the primary principal–agent conflict is between the controlling block holder, who is typically also the CEO, and minority shareholders, who typically also are block holders (Fama and Jensen 1983). This conflict is mitigated by the extremely large ownership position of the CEO, which averages 70 %, and by the strong personal relationships and family ties that often bind the controlling block holder to minority shareholders.

Fifth, all public corporations in the USA are organized as C-corporations, so that dividend distributions are taxed at both the corporate and personal levels. In contrast, private US corporations are a mix of C-corporations and S-corporations; S-corporations avoid taxation at the corporate level. This has important implications for CEO pay, as CEOs of C-corporations should prefer salary income to dividend income.

Finally, a CEO who owns the majority of shares at a private firm is likely to be unresponsive to the labor market for executives because ownership considerations are likely to dominate labor market considerations.

For all of these reasons, the determinants of executive compensation at private corporations are likely to be fundamentally different from those at public corporations. What researchers have learned about executive compensation from ExecuComp data on large public firms is unlikely to hold true for private firms.

4 Determinants of executive compensation at privately held firms

The search for the determinants of the level of executive compensation has evolved as a corollary to the neoclassical versus managerialist debate about the pattern of corporate behavior.[6] For example, Murphy (1985) has demonstrated that changes in executive

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[6] See Rosen (1982) for an early discussion. A survey article by Murphy (1999) is generally regarded as the definitive work in this area of the literature, providing references to more than 200 academic articles published up through 1998. Hallock and Murphy (1999) reprint 45 of the most influential of these manuscripts.

compensation are a positive function of changes in sales, even after controlling for the value of the firm. Baker et al. (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 its elasticity with respect to firm sales of about 0.3 and that this regularity is remarkably stable across industries. Murphy (1999), however, points out that this relation has weakened over time. He further argues that sales remain 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.) In the management literature, Tosi et al. (2000), through a meta-analytic review of the literature on CEO pay, find that firm size accounts for more than 40 % of the variability in pay. This leads us to our first hypothesis:

Hypothesis 1 Executive compensation at privately held firms is a positive function of firm size as measured by annual sales revenues because annual sales is the most widely recognized benchmark for CEO pay.

Scholes and Wolfson (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 salary, 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.[8] In addition, dividend income is not subject to payroll withholding taxes, which are imposed at a rate of 15.3 % on salary income up to a maximum income, which was $60,600 ($87,000) at the time of the 1993 (2003) SSBF. Consequently, CEOs of S-corporations can increase their after-tax income by taking distributions in the form of dividends rather than salary, so long as their salary is less than the payroll tax income cap.[9] Above the cap, CEOs of S-corporations should be indifferent between salary and dividend income from a taxation perspective.[10] Taking into account both the incentive of C-corporation CEOs to favor compensation over dividends and the incentive of S-corporation CEOs to favor dividends over compensation, we expect CEO pay to be higher at C-corporations than at S-corporations. This is our second hypothesis:

Hypothesis 2 Because of the double taxation of dividends received from C-Corporations, executive compensation should be higher at C-corporations than at S-corporations.

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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] Mehran and Suher examined a large sample of converted banks post-1997 when banks were allowed for the first time to organize themselves as an S-corporation and document that they pay more dividends post-conversation relative to control groups.

[9] The median CEO pay for S-corporations in our 1993 (2003) sample is $38,000 ($50,000), so the majority of our S-corporation CEOs would have incentive to favor dividends over salary.

[10] 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.

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, and presents this 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.

Consequently, we expect CEO ownership to affect this relation 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 $1.00 in compensation via dividend payments. At S-corporations, where there is no corporate tax, each dollar of gross profits distributed as salary is worth more to the CEO than each dollar of gross profits distributed as dividends because the CEO receives all of the salary but only α % of the dividends, where ($\alpha < 100$ %) is the CEO's ownership percentage. 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 $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.[11] 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. This leads us to our third hypothesis:

Hypothesis 3 Executive pay at privately held firms is an inverse function of CEO ownership because it is more costly to compensate a CEO via dividend distributions as ownership declines. Moreover, this effect should be 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 at small privately held firms, where the CEO typically owns a majority of the firm's equity and CEO pay is large relative to profits.[12] At such firms, CEO pay is, in large part, a conduit for distributing residual cash flows to the controlling owner. When residual cash flows in a particular year are high or low, the CEO can adjust her salary accordingly. Consequently, we expect CEOs to reduce their pay as leverage increases. In addition, banks and other lenders to privately held 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 is inversely related to firm leverage as measured by total loans to total assets. This leads to our fourth hypothesis:

Hypothesis 4 Executive pay at privately held firms is inversely related to firm leverage because CEOs wish to reduce the probability of financial distress to protect their future cash flows from the firm.

Murphy (1999, p. 9) notes that firm size is an imperfect proxy for the complexity of the CEO's job. Theory suggests that managers are compensated more highly for managing more complex firms. Gomez-Mejia et al. (1987) note that organizational complexity was a potentially important explanatory variable omitted from their analysis of executive compensation. This leads to our fifth hypothesis:

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[11] At $\alpha = 100$ %, one dollar of salary would be exactly equivalent to one dollar of dividends for the shareholder-manager of an S-corporation, ignoring the effect of the payroll tax. At compensation levels below the IRS maximum level of income subject to the Social Security portion of the payroll tax ($60,600 in 1993, $87,000 in 2003), CEOs of S-corporations should favor dividends over salary because dividend distributions are not subject to the 12.4 % payroll deduction.

[12] In our 1993 (2003) sample, the median firm has CEO pay of $45,000 ($53,000), but profits of only $20,000 ($37,000). Median CEO ownership is 60 % (95 %).

Hypothesis 5 Executive pay at privately held firms is higher at more complex firms.

In an attempt to capture additional aspects of complexity not measured by annual sales, we analyze three dummy variables. First, we include a variable indicating whether the firm primarily does business only in the local area as opposed to also doing business regionally, nationally or internationally. We expect a negative relation between executive pay and this indicator variable. Second, we include a variable indicating whether the firm conducts business only at a single site as opposed to conducting business from multiple locations. We expect a positive relation between executive pay and this variable. Third, we include a variable indicating whether or not the firm obtains pension or brokerage services from a financial institution, which is a proxy for the complexity of the firm's finances. We expect a positive relation between executive compensation and this variable.[13]

Finally, there is a broad literature on the relation between earnings and work age, education and gender (See, e.g., Weiss 1986; Card 1999). In general, these studies find that earnings are an increasing function of educational attainment. In addition, Murphy (1999, p. 9) notes that "age, experience and education… [are] criteria many labor economists consider relevant for predicting earnings levels." Main et al. (1993) include CEO age, experience and education as explanatory variables in their study of executive pay; and Chung and Pruitt (1996) find a positive but insignificant relation between educational attainment and CEO pay in a sample of CEOs of large publicly traded firms. This leads to our sixth hypothesis:

Hypothesis 6 Executive pay at privately held firms is a positive function of the highest educational attainment of the CEO.

We test whether this relation holds true for our sample of CEOs by including dummy variables for CEOs that attended college (Some College), received an undergraduate degree (College) or received a graduate degree (Graduate). CEOs with only a high school degree or less is the omitted category, so our

educational attainment dummies measure the percentage increase in CEO pay that is associated with additional educational attainment. We expect to find that higher educational attainment is associated with higher CEO pay.

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 on senior managers. 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 12-year median age of our sample firms. Therefore, the findings of the existing literature may not be applicable to our sample. However, Mayers and Smith (1992) include CEO age and experience as proxies for the level of human capital in their study of CEO pay at insurance companies. Bliss and Rosen (2001) include CEO age as a control variable in their study of CEO pay at banks involved in mergers. This leads to our seventh hypothesis:

Hypothesis 7 Executive pay at privately held firms follows the life cycle hypothesis, as the CEOs in our sample have significant influence on their level of pay.

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. Barro and Barro (1990) also use this quadratic specification for CEO in their study of pay, performance and turnover of bank CEOs.

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 between senior executives at listed US 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. Because of the

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[13] Several studies, including Henderson and Fredrickson (1996) and Sanders and Carpenter (1998), have shown that CEO pay is related to organizational complexity. Bushman et al. (2004) find that directors' equity-based incentives vary with organizational complexity.

significant input that private-firm CEOs have in setting their own pay when their ownership stake is large, gender discrimination is unlikely to depress the pay of female CEOs relative to their male counterparts.[14] This leads to our eighth hypothesis:

Hypothesis 8 Executive compensation at privately held firms is no lower for female CEOs than for male CEOs.

Therefore, we expect to find that our control variable for the gender of the CEO is insignificantly different from zero.

To summarize our hypotheses, we expect executive compensation at privately held firms to be positively related to firm size; to firm status as a C-corporation; to firm complexity as proxied by the number of sites where the firm operates, by whether the firm uses pension and brokerage services and by whether the firm operates outside of its local area; and to the CEO's highest educational attainment. We expect a negative relation with CEO ownership share and firm leverage. We expect a quadratic relation with CEO age; and we expect no relation to CEO gender.

5 Data and methodology

5.1 Data

In this study, we utilize data from five sources. The first two sources are the 1993 and 2003 Surveys of Small Business Finances ("SSBF"), which were co-sponsored and co-funded by the Federal Reserve Board and the US Small Business Administration and are available at the Board's Web site.[15] Data from the

SSBFs have been used by numerous finance researchers during the past two decades, the most notable being Ang et al. (2000), Berger et al. (2005), Berger and Udell (1995), Bitler et al. (2005), Blanchflower et al. (2003), Cole (1998), Cole et al. (2004), Detragiache et al. (2000), Moskowitz and Vissing-Jorgensen (2002), Petersen and Rajan (1994, 1995, 1997, 2002) and Rice and Strahan (2010).

The firms surveyed constitute a nationally representative sample of 4637 (4240) small businesses operating in the USA as of year-end 1993 (2003), where a small business is defined as a non-financial, non-farm business employing fewer than 500 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 several restrictions on the SSBF samples. First, we exclude publicly traded firms from each sample. The SSBF selects firms based upon employment size so that it includes a very small number of public firms. There are 32 public firms among the 4637 observations in the 1993 SSBF firms and 9 among the 4240 observations in the 2003 SSBF. This restriction leaves us with a clean sample of privately held firms.

Second, we use information on organizational form to identify and exclude proprietorships and partnerships from our analysis because we want to compare CEO compensation across firms of similar organizational form, and because the SSBFs did not ask these types of firms about their executive compensation. This eliminates about half of the total number of observations from both the 1993 and 2003 SSBFs. 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

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[14] Murphy (1999) and others have documented that CEOs of large publicly traded firms have significant discretion in the level and form of their pay, even when CEO ownership is quite small. Therefore, it is reasonable to assume that the CEOs of our small firms, who typically own a controlling stake in their firms, have far more discretion in setting their own pay.

[15] Internet Appendix II in "Electronic Supplementary Material" provides more details about the 1993 and 2003 SSBFs. Similar surveys were conducted for 1987 and 1998, but neither of those two surveys collected information on CEO pay. The survey questionnaire and methodology reports are available, along with other information, at the Federal Reserve Board's Survey of Small Business Finances Web site: http://www.federalreserve.gov/pubs/oss/oss3/nssbftoc.htm. Also see Cole and Wolken (1995) for a descriptive study of the 1993 SSBF and

Footnote 15 continued
Mach and Wolken (2006) for a descriptive study of the 2003 SSBF.

comparable to, corporate form of organization.[16] In addition, the transactions costs associated with partnerships may exceed that of corporate form (see Guenther 1992).

Third, we exclude firms where day-to-day management of the firm was the responsibility of someone other than one of the owners of the firm. We exclude these firms because we cannot match up owner characteristics, such as ownership of the primary shareholder, with officer compensation.

Fourth, we exclude firms that did not know or refused to divulge their amount of CEO compensation because we cannot analyze CEO pay without this variable.

Finally, we exclude a handful of firms (fewer than 10 in each survey) that reported zero sales or assets. These restrictions leave us with a final sample of 1630 firms from the 1993 SSBF, of which 1009 are C-corporations and 621 are S-corporations; and with a final sample of 1668 firms from the 2003 SSBF, of which 601 are C-corporations and 1067 are S-corporations.

Our second source of data is Standard and Poor's Compustat, from which we obtain financial data on publicly traded firms. Our third source of data is Standard and Poor's ExecuComp, from which we obtained CEO compensation 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 exclude firms in agriculture and financial services, as firms in these industries are excluded from the SSBFs.

For public companies, we pool data across years in order to have a sufficient number of observations to calculate pay-size elasticities for a wide range of size categories. Murphy (1999) documents that the pay-size elasticities for public firms are relatively time invariant, so this pooling should not cloud comparisons with the 1993 SSBF data. However, we also calculate elasticities for broader grouping of ExecuComp firms using data only from 1992 to 1994 (3139 firm-year observations) and 2002–2004 (5008 firm-year observations). Our purpose here is to examine whether or not the pay-size elasticity of 0.3 holds true for 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.

Our fourth and final source of data is the set of proxy statements filed with the US Securities and Exchange Commission by all listed firms. We use this source to collect compensation data for public firms that are no larger than the largest firm in the SSBF data as measured by total assets, which is $250 million. We collect data from 1992 to 1994 and 2001 to 2003 because these years most closely correspond to data from the 1993 SSBF and 2003 SSBF, respectively. We do not use data from 2004 because of difficulties in obtaining proxy statements in text format rather than HTML format, and many firms ceased providing proxies in text format beginning in 2004. Our search tools with which we search through the proxy statements for compensation data work poorly on HTML documents so we were only able to gather 2004 data on a small number of firms.

From Compustat, we first selected all firms with assets less than $250 million, which is the largest value reported for total assets by a firm in the SSBF, and collected total assets, total employment and annual sales for each of the 3 years. We exclude firms in agriculture and financial services, as firms in these industries also are excluded from the SSBFs. Next, we collected information on salary and bonus compensation (which we sum to get total compensation) from the proxy statements for each of these firms. As documented in the footnote below, we expect that the use of stock options by privately held firms is extremely rare because only large public firms typically use such compensation.[17] Moreover, there is no readily available price by which to value options on the stock of a private corporation.

Our proxy sample provides compensation data on 469 firms in 1992, 1360 firms in 1993 and 2528 firms in 1994, for a total sample of 4357 firm-year observations to match with the 1993 SSBF; and 591 firms in 2001, 563 firms in 2002 and 430 firms in 2003, for a

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[16] Some variations of partnerships offer some, but not all, of 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.

[17] For the population of US firms that were publicly traded during 1994, we examined the proxy statement of each firm. We found that no firm with less than $10 million in total assets issued stock options and only one percent of firms with assets between $10 million and $100 million issued stock options.

total sample of 1584 firm-year observations to match with the 2003 SSBF. Together with the Compustat data on total employment, total assets and annual sales, these compensation data enable us to calculate pay-size elasticities for these small public companies. This provides us compensation data on public firms that are much more comparable to our privately held firms than anything available from ExecuComp.

Internet Appendix III in "Electronic Supplementary Material" provided detailed definitions for each of our variables from each different source.

5.2 Methodology

To test our predictions regarding the determinants of executive compensation at privately held firms, we follow the standard empirical model, which relates cash compensation to accounting variables (see, e.g., Lambert and Larcker 1987; Baber et al. 1996, 1998, 1999; Sloan 1993; Matsunaga and Park 2001). First, we analyze univariate statistics for our analysis variables—total assets; total sales revenues; total full-time 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" privately held 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:

$$\ln \left(\text{CEO Compensation}_i \right) = \beta' X_i + \varepsilon_i \qquad (1)$$

where $\ln \left(\text{CEO Compensation}_i \right)$ 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 the CEO is a female; and a set of nine dummy variables indicating the firm's one-digit SIC code[18]; and ε_i is a normally distributed error term.

There is one critically important limitation inherent in the SSBF data on executive compensation. The survey asks for total amount of officers' compensation rather than for the amount of CEO compensation.[19] Hence, for SSBF firms with multiple officers, this amount likely contains the sum of compensation paid to all officers of the firm. For most SSBF firms, this is not a problem, as it is highly unlikely that there are multiple officers at firms with less than 10 employees, which constitute the majority of our sample. In addition, we have restricted our sample to firms where the primary owner also serves as the day-to-day manager of the firm. Even so, this limitation of the data should be kept in mind when interpreting the analysis, especially when comparing pay-size elasticities of the privately held SSBF firms with those of publicly traded ExecuComp and SEC proxy firms, where we use only the pay of the CEO. One way to at least partially address this issue is to analyze the subset of SSBF firms where the primary owner holds 100 % of the firm's shares, in addition to serving as the day-to-day manager of the firm. It is highly unlikely that such firms have multiple officers, so this analysis provides an important test of the robustness of our data.

6 Empirical results

6.1 Sample characteristics

6.1.1 Characteristics of the 1993 and 2003 SSBF samples

Table 1 presents executive pay by size distribution and organizational form (S-corporation or C-corporation).

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

[19] In the 1993 SSBF, question P10 asks "During (YEAR), what was the amount of officers' compensation?" In the 2003 SSBF, question P5.5 asks "For the fiscal year ending (DATE), what was the total amount of officers' compensation?"

Table 1 Executive pay at privately held corporations

Sales quartile ($000)	1993							2003						
	All		S-Corp		C-Corp		t-stat	All		S-Corp		C-Corp		t-stat
	Obs.	$000	Obs.	$000	Obs.	$000		Obs.	$000	Obs.	$000	Obs.	$000	
Quartile 1: smallest	400	33.5 (1.49)	195	33.3 (2.19)	205	33.8 (2.03)	−0.17	417	36.2 (1.57)	325	37.0 (1.86)	92	33.0 (2.73)	1.21
Quartile 2	403	78.5 (4.97)	132	62.5 (5.49)	271	86.0 (6.82)	−2.68	413	99.5 (4.64)	280	90.6 (5.25)	133	121.0 (9.17)	−2.88
Quartile 3	418	164.6 (10.01)	139	158.9 (14.36)	279	167.1 (13.12)	−0.42	421	183.8 (10.85)	226	160.2 (13.15)	195	210.7 (17.60)	−2.30
Quartile 4: (largest)	409	389 (23.04)	155	385.1 (45.48)	254	391 (25.58)	−0.11	417	439.4 (28.74)	236	419.0 (35.22)	181	473.5 (48.82)	−0.91
Total	1630	98.3	621	80.7	1009	109.7	−3.04	1668	108.3	1067	92.4	601	145.6	−4.50

Table 1 presents average executive compensation by size quartiles and organizational form, with standard errors in parentheses. In the last column of Table 1 is the t-statistic for a test of differences in the means of S-corporations and C-corporations. Data are taken from the 1993 and 2003 surveys of small business finances (SSBFs)

In 1993, approximately two-thirds of all corporations were organized using the C-form and one-third using the S-form. By 2003, those percentages had reversed with only one-third organizing as C-form and two-thirds organizing as S-form. This is likely attributable by changes in the tax law increasing the maximum number of shareholders in an S-corporation from 35 in 1993 to 75 in 1996 and 100 in 2004. In addition, the highest marginal tax rate on individuals dropped from 39.5 to 35 % in 2003, making the S-form more attractive. (Many of the 2003 SSBF interviews were conducted in 2004, although the reference year was 2003.) The distribution by size, as measured by sales quartiles, also changed from 1993 to 2003. In 1993, the distributions of both C-corporations and S-corporations were relatively uniform, but, by 2003, smaller firms were disproportionately organized as S-corporations, whereas larger firms were disproportionately organized as C-corporations.

The results for all 1993 (2003) SSBF firms shown in column 1 (column 4) clearly show a positive relation between firm size and executive compensation, with the average CEO pay rising from $33,500 ($36,200) in the smallest quartile, to $78,500 ($99,500) and $164,600 ($183,800) in the middle quartiles, and to $389,000 ($439,400) in the largest quartile. Table 1 also shows that CEO compensation is significantly higher at C-corporations than at S-corporations ($109,700 versus $80,700 in 1993 and $145,600 versus $92,400 in 2003) and that these differences ($29,000 in 1993 and $53,200 in 2003) are both statistically significant at better than the 0.001 level based upon a t test for difference in means.

6.1.2 Characteristics of the ExecuComp samples

Table 2 presents the size distribution of our ExecuComp firms based upon data from 1992 to 1994 and from 2001 to 2003 and defining CEO pay as the sum of salary plus bonus, or total cash compensation. In the earlier subsample, the median CEO pay was $750,000, whereas the mean was $983,700; in the later subsample, the median CEO pay was $972,300, while the mean was $1,418,000. The differences in the means and medians speak to the positive skewness of the pay distribution.

As with the SSBF samples given in Table 1, we clearly see a positive relation between firm size as measured by annual sales and CEO pay, but on a far

Table 2 Executive pay at large public US corporations

1992–1994 sample	Obs.	Median ($000)	Mean ($000)	Std. error ($000)	2001–2003 sample	Obs.	Median ($000)	Mean ($000)	Std. error ($000)
All firms	3139	750.0	983.7	18.2	All firms	5008	972.3	1418	23.8
By sales quartile					By sales quartile				
Quartile 1: smallest	792	424.5	485.4	9.4	Quartile 1: smallest	1262	526.1	635.3	14.5
Quartile 2	782	617.8	772.9	41.6	Quartile 2	1249	784.3	944.2	17.7
Quartile 3	782	917.1	1065.7	31.3	Quartile 3	1248	1173.8	1459.5	36.7
Quartile 4: largest	783	1375.0	1616.3	40.3	Quartile 4: largest	1249	2073.1	2642.4	73.2

CEO salary plus cash bonus at ExecuComp sample of large public corporations

Table 2 presents descriptive statistics for executive compensation at large public corporations by year and by sales quartiles based upon data from ExecuComp for 3139 firm-year observations from 1992 to 1994 and 5008 firm-year observations for 2001–2003. Executive pay is defined as the sum of the CEO's salary and cash bonus

larger scale. For the 1992–1994 subsample, average CEO pay rises from $485,400 in the smallest sales quartile, to $772,900 and $1,065,700 in the middle quartiles, and to $1,616,300 in the largest quartile. For the 2001–2003 subsample, average CEO pay rises from $635,300 in the smallest sales quartile, to $944,200 and $1,459,500 in the middle quartiles, and to $2,642,400 in the largest quartile. The variance in CEO pay also clearly rises with firm size.

The statistics in Table 2 understate total compensation because they are based upon total cash compensation, which excludes option grants. In Table 3, we present the same information as in Panel C, but based upon total compensation, which is cash compensation plus option grants.

The correlation between the two compensation measures is about 0.3, but total compensation is much larger—roughly double in amount. In the early subsample, median CEO pay was $1,298,300, whereas the mean was $2,132.5; in the later subsample, the median CEO pay was $2,544,500, while the mean was $5,258,600. These results would appear to support the contention of Murphy (2002, 2012) that the rise in CEO pay at public firms during the 1990s was driven by an explosion in the issuance of options based upon their perceived cost instead of their true economic cost.

As with the total cash compensation, we clearly see a positive relation between firm size as measured by annual sales and CEO pay. For the 1992–1994

Table 3 CEO salary plus cash bonus plus option grants at ExecuComp sample of large public corporations

1992–1994 sample	Obs.	Median ($000)	Mean ($000)	Std. error ($000)	2001–2003 sample	Obs.	Median ($000)	Mean ($000)	Std. error ($000)
All firms	3139	1298.3	2132.5	50.2	All firms	5008	2544.5	5258.6	154.8
By sales quartile					By sales quartile				
Quartile 1: smallest	792	703.3	1172.7	61.5	Quartile 1: smallest	1262	1253.1	2207.7	98.4
Quartile 2	782	1006.6	1613.3	89.9	Quartile 2	1249	1783.3	3449.4	382.6
Quartile 3	782	1499.0	2198.8	88.5	Quartile 3	1248	3006.4	5009.7	286.8
Quartile 4: largest	783	2625.8	3557.6	128.5	Quartile 4: largest	1249	7150.2	10,370.3	338.7

Table 3 presents descriptive statistics for executive compensation at large public corporations by year and by sales quartiles based upon data from ExecuComp for 3139 firm-year observations from 1992 to 1994 and 5008 firm-year observations for 2001–2003. Executive pay is defined as the sum of the CEO's salary, cash bonus and value of any option grants

subsample, average CEO pay rises from $1,172,700 in the smallest sales quartile, to $1,613,300 and $2,198,800 in the middle quartiles, and to $3,557,600 in the largest quartile. For the 2001–2003 subsample, average CEO pay rises from $2,207,700 in the smallest sales quartile, to $3,449,400 and $5,009,700 in the middle quartiles, and to $10,370,300 in the largest quartile.

6.1.3 Characteristics of the SEC proxy sample

Table 4 presents the size distribution of our SEC proxy firms based upon data from 1992 to 1994 and from 2001 to 2003. In the earlier subsample, the median CEO pay was $225,000, whereas the mean was $441,200; in the later subsample, the median CEO pay was $312,400, while the mean was $480,500. The differences in the means and medians speak to the positive skewness of the pay distribution.

As with the SSBF and ExecuComp samples, we again see a positive relation between firm size as measured by annual sales and CEO pay. For the 1992–1994 subsample, average CEO pay falls from $331,700 in the smallest sales quartile, to $299,100 in the second quartile, but this difference is not statistically significant; pay then rises to $538,900 in the third quartile and to $594,800 in the largest quartile. For the 2001–2003 subsample, average CEO pay falls from $515,300 in the smallest sales quartile, to $452,600 and $404,000 in the middle quartiles, but then rises to

$549,200 in the largest quartile. Pay in the largest quartile is not significantly different from that in the smallest quartile, but is significantly larger than in the middle two quartiles. For these smaller public firms, the variance in CEO pay rises with firm size in the early subsample, but declines with firm size in the later subsample.

6.2 Comparisons of executive pay across samples

As expected, the average CEO pay as measured by salary plus bonus increases across our three samples. In the earlier period, pay increases from $98,300 for private firms to $441,200 for small public firms and to $983,700 for large public firms. In the later period, pay increases from $108,300 for private firms to $480,500 for the small public firms and to $1,418,000 for the large public firms.

Also, as expected, the $485,400 average pay at the smallest quartile of large public firms ($485,400 in the early period and $635,300 in the later period) is significantly larger than the $389,000 average pay at the largest quartile of private firms ($389,000 in the early period and $439,400 in the later period).

However, the average cash compensation at the smallest quartile of large public companies is comparable to the average cash compensation at the largest quartile of small public companies ($594,800 in the early period and $549,200 in the later period); and the average pay at the smallest quartile of small public

Table 4 CEO salary plus cash bonus at SEC proxy sample of small public corporations

1992–1994 sample					2001–2003 sample				
	Obs.	Median ($000)	Mean ($000)	Std. error ($000)		Obs.	Median ($000)	Mean ($000)	Std. error ($000)
All firms	4357	225.0	441.2	21.6	All firms	1584	312.4	480.5	26.6
By sales quartile					By sales quartile				
Quartile 1: smallest	1089	147.0	331.7	37.4	Quartile 1: smallest	403	237.0	515.3	75.5
Quartile 2	1089	189.9	299.1	26.6	Quartile 2	394	258.4	452.6	65.2
Quartile 3	1089	254.4	538.9	53.7	Quartile 3	393	328.1	404.0	18.8
Quartile 4: largest	1090	357.9	594.8	49.3	Quartile 4: largest	394	440.5	549.2	29.8

Table 4 presents descriptive statistics for executive compensation at small public corporations by year and by sales quartiles based upon data for 4357 firm-year observations obtained from 1992 to 1994 SEC proxy statements for firms no larger than the largest firm in the 1993 SSBF sample ($250 million in total assets) and for 1584 firm-year observations obtained from 2001 to 2003 SEC proxy statements for firms no larger than the largest firm in the 2003 SSBF sample ($250 million in total assets). Executive pay is defined as the sum of the CEO's salary and cash bonus

companies ($331,700 in the early period and $515,300 in the later period) is comparable to the average pay at the largest quartile of private companies.

6.3 Trends in executive pay over time

According to Murphy (1999, 1), one of the stylized facts about executive compensation is an "undisputed escalation in chief executive officer (CEO) compensation." Murphy (2012) reports that CEO pay at the S&P 500 firms more than tripled from 1992 to 2001 and that this increase has motivated a large number of papers seeking to explain it.

In our sample of ExecuComp firms, the median cash compensation (shown in Table 2) rose from $738,500 in 1993 to $1,054,000 in 2003. However, after adjusting for the 27 % increase in the CPI during this same period, the 43 % nominal increase in CEO pay translates into only a 13 % real increase in CEO pay. The mean cash compensation at these same firms increased by 62 % on a nominal basis and by 28 % on a real basis. Median total compensation (shown in Panel D of Table 1) rose by 98 % from $1,258,800 in 1993 to $2,498,600 in 2003. After adjusting for inflation, this is a 56 % real increase. The mean total compensation rose 122 % and in the largest sales quartile rose by 191 %. Clearly, the escalation in CEO compensation favored the largest of the large public companies and was not as egregious at smaller ExecuComp companies.

In our SEC proxy sample (shown in Table 4), the median compensation rose from $225 thousand in 1993 to $297 thousand in 2003. After adjusting for inflation, this 32 % nominal increase in CEO pay translates into a real increase of only 4 %. The mean compensation rose from $417 thousand to $478 thousand—a nominal increase of only 15 %, implying that the average real CEO pay actually declined by almost 10 % at these small public companies.

By comparison, the median compensation at privately held firms (not shown the tables) rose from $45 thousand in 1993 to $52 thousand in 2003, and this 16 % nominal increase translates into a 9 % real decrease in executive pay. Using the mean instead of the median, we find that a 10 % nominal increase in pay translates into a 13 % real decrease in executive pay at privately held firms. By either measure, executive pay at privately held firms has been falling on a real basis, whereas it has been rising on a real

basis at large public firms. Hence, this "stylized" fact about executive compensation based upon ExecuComp data from public firms does not appear to hold at privately held firms or even at small public companies.

6.4 Descriptive statistics for privately held firms

Table 5 presents the descriptive statistics for the SSBF 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 1993 (2003) sample paid its CEO $98,300 ($108,300), generated $1.921 million ($1.914 million) in annual sales revenues and had a loan-to-asset ratio of 41.5 % (63.9 %). C-corporations account for 60.4 % (29.8 %) of the sample. The average firm had been in business for 14.9 years in both 1993 and 2003. Average ROA was 39.8 % in 1993 and 61.5 % in 2003. In 1993 (2003), 53.1 % (52.4 %) of the firms reported that they only did business locally, and 21.0 % (19.1 %) reported that they had operations at multiple sites.

The average firm's CEO owned 68.9 % (76.3 %) of the firm's stock, was 49.1 (51.3) years old and was female in gender 15.2 % (20.4 %) of the time. The CEO held a graduate degree at 19.0 % (22.1 %) of the firms and held a 4-year college degree at 34.2 % (32.9 %) of the firms.

Table 5 also shows descriptive statistics separately for the subsamples of S- and C-corporations. These statistics show that S-corporations are significantly smaller than C-corporations in terms of annual sales and significantly younger.

6.5 Determinants of executive compensation at privately held firms

In Table 6, we use multivariate regression to analyze the determinants of executive pay at privately held firms. We begin with a simple model (not shown in Table 3 for brevity) that includes only firm size. The pay-sales elasticity for the full 1993 (2003) SSBF sample is 0.569 (0.457) and is estimated with great precision as evidenced by its associated t-statistic of 34.6 (33.5). By itself, size explains more than 40 % of the variability in executive pay for each sample.

Next, we add a set of indicator variables for industry. Our results (omitted for brevity) show that,

Table 5 Descriptive statistics for privately held US corporations

Variable	(1) 1993 All corps	(2) 1993 S-corp	(3) 1993 C-corp	(4) 2003 All corps	(5) 2003 S-corp	(6) 2003 C-corp
Observations	1630	621	1009	1668	1067	601
Firm characteristics						
Executive compensation ($000)	98.3	80.7	109.7	108.3	92.4	145.6
	(4.7)	(7.3)	(6.1)	(5.0)	(5.4)	(10.5)
Annual sales ($000)	1921	1710	2059	1914	1745	2312
	(123.6)	(198.9)	(157.7)	(162.5)	(202.1)	(273.5)
D&B credit score	n/a	n/a	n/a	3.9	3.8	4.1
				(0.04)	(0.05)	(0.06)
Loan-to-asset ratio	0.415	0.427	0.408	0.639	0.678	0.546
	(0.01)	(0.02)	(0.02)	(0.036)	(0.050)	(0.043)
C-corporations	0.604	0.000	1.000	0.298	0.000	1.000
	(0.01)	(0.00)	(0.00)	(0.011)	0.000	0.000
Firm age	14.899	12.774	16.293	14.885	13.296	18.626
	(0.31)	(0.42)	(0.02)	(0.253)	(0.304)	(0.419)
Return on assets	0.398	0.495	0.555	0.615	0.738	0.324
	(0.02)	(0.02)	(0.02)	(0.025)	(0.033)	(0.035)
Firm does business locally	0.531	0.195	0.220	0.524	0.536	0.495
	(0.01)	(0.02)	(0.01)	(0.012)	(0.015)	(0.020)
Firm operates at multiple sites	0.210	0.694	0.686	0.191	0.187	0.202
	(0.01)	(0.01)	(0.01)	(0.010)	(0.012)	(0.016)
Owner characteristics						
CEO ownership	68.90	69.40	68.57	76.33	76.22	76.58
	(0.01)	(1.59)	(0.86)	(0.629)	(0.788)	(1.045)
CEO age	49.10	47.68	50.03	51.26	49.90	54.47
	(0.27)	(0.42)	(0.34)	(0.257)	(0.307)	(0.446)
CEO is female	0.152	0.168	0.142	0.204	0.201	0.210
	(0.01)	(0.01)	(0.01)	(0.010)	(0.012)	(0.017)
CEO has graduate degree	0.190	0.165	0.207	0.221	0.212	0.242
	(0.01)	(0.01)	(0.01)	(0.010)	(0.013)	(0.017)
CEO has college degree	0.342	0.370	0.326	0.329	0.330	0.328
	(0.01)	(0.02)	(0.01)	(0.012)	(0.014)	(0.019)

Data for 1630 (1668) corporations are taken from the 1993 (2003) survey of small business finances (SSBFs). For each variable, we present the mean and, in parentheses below, the standard error. Column 1 (4) presents results for all firms while columns 2 (5) and 3 (6) present results for S-corporations and C-corporations, respectively. *Executive compensation* is total officers' compensation. *Annual sales* is the firm's annual sales revenues. *D&B credit score* is a categorical version of the firm's Dun & Bradstreet credit score (higher means better credit). *Loan-to-asset ratio* is total loans divided by total assets. *C-corporation* is a dummy variable, indicating that the firm is organized as a C-corporation. *Firm age* is the number of years that the firm has been doing business under current ownership. *Return on assets* is profit divided by total assets. *Firm does business locally* is a dummy variable indicating that the firm primarily does business in the metropolitan area where it is located (as opposed to regionally, nationally or internationally). *Firm operates at multiple sites* is a dummy variable indicating that the firm does business at two or more sites. *CEO ownership* is the percentage of the firm owned by the principal owner. *CEO age* is the age of the principal owner. *CEO age squared* is the square of CEO age. *CEO has graduate degree* and *CEO has college degree* are dummy variables, indicating the highest educational attainment of the principal owner. *CEO is female* is a dummy variable, indicating that the principal owner is female

Table 6 Determinants of executive compensation at privately held US corporations

Regression model	Expected sign	(1) 1993	(2) 2003	(3) 1993	(4) 2003	(5) 1993	(6) 2003	(7) 1993	(8) 2003
Intercept		7.03**	−2.340**	6.662	−2.765**	6.78**	−1.78**	5.15**	−2.67**
		(56.79)	(11.56)	(−17.41)	(−6.97)	(17.91)	(4.50)	(6.67)	(4.06)
Firm characteristics									
ln(Sales)	+	0.584**	0.432**	0.599**	0.464	0.570**	0.407**	0.601**	0.353**
		(33.35)	(30.62)	(36.67)	(34.81)	(32.52)	(29.02)	(17.91)	(18.13)
Firm's D&B credit score	?	n/a	0.065**			n/a	0.067**	n/a	0.059**
		n/a	(4.72)			n/a	(4.94)	n/a	(2.81)
Loan-to-asset ratio	−	−0.225**	0.006			−0.237**	−0.010	−0.314**	−0.018
		(5.72)	(0.42)			(6.11)	(0.74)	(4.01)	(0.90)
C-corporation	+	0.143**	0.127**			0.137**	0.161**	0.195*	0.147*
		(3.15)	(2.82)			(3.07)	(3.64)	(2.34)	(2.12)
Firm age	?	−0.0016	0.002			0.0005	0.0048**	−0.0012	0.0032
		(0.87)	(0.83)			(0.27)	(2.10)	(0.22)	(0.89)
Return on assets	?	−0.003	−0.047*			−0.0087	−0.049**	−0.0207	−0.043
		(0.13)	(2.42)			(0.37)	(2.58)	(0.53)	(1.46)
Firm does business locally	−	−0.030	−0.037			−0.0155	−0.028	−0.0405	−0.091
		(0.64)	(0.90)			(0.33)	(0.68)	(0.49)	(1.37)
Firm operates at multiple sites	+	−0.033	0.067			−0.0516	0.064	−0.173	0.165*
		(0.59)	(1.30)			(0.94)	(1.28)	(1.69)	(2.01)
Firm uses pension or brokerage services	+	0.290**	0.412**			0.247**	0.385**	0.192	0.344**
		(4.98)	(8.73)			(4.27)	(8.29)	(1.81)	(4.84)
Owner characteristics									
CEO ownership	−			−0.412**	−0.555**	−0.403**	−0.548**	n/a	n/a
				(4.97)	(6.98)	(4.93)	(7.16)	n/a	n/a
CEO age	?			0.028	0.0337*	0.0308*	0.0132	0.078*	0.055*
				(1.89)	(2.47)	(2.10)	(0.99)	(2.46)	(2.26)
CEO age squared	?			−0.0032*	−0.0003*	−0.0004*	−0.0002	−0.0009**	−0.0006*
				(2.23)	(2.46)	(2.55)	(1.52)	(2.75)	(2.56)
CEO has graduate degree	+			0.280**	0.126*	0.246**	0.081	0.222	0.153
				(4.26)	(2.05)	(3.79)	(1.40)	(1.88)	(1.67)
CEO has college degree	+			0.054	0.093*	0.0441	0.064	0.0201	0.150*
				(1.07)	(1.97)	(0.89)	(1.40)	(0.21)	(1.99)

Table 6 continued

Regression model	Expected sign	(1) 1993	(2) 2003	(3) 1993	(4) 2003	(5) 1993	(6) 2003	(7) 1993	(8) 2003
CEO is female	?			−0.133*	−0.236**	−0.129*	−0.260**	−0.114	−0.227**
				(2.18)	(4.66)	(2.15)	(5.27)	(0.99)	(2.98)
Industry controls		Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**	Yes**
Adjusted R^2		0.519**	0.518**	0.516**	0.496**	0.534**	0.542**	0.537**	0.461**

Results are obtained from a regression of the natural logarithm of executive compensation against a set of explanatory variables. Results in columns 1, 3 and 5 (2, 4 and 6) are based upon data from a sample of 1640 (1660) corporations taken from the 1993 (2003) survey of small business finances. Results in column 7 (8) are based upon a sample of 456 (640) corporations with 100 % CEO ownership from the 1993 (2003) SSBF. *ln(Sales)* is the natural logarithm of one plus the firm's annual sales revenues. *D&B credit score* is a categorical version of the firm's Dun & Bradstreet credit score (higher means better credit). *Loan-to-asset ratio* is total loans divided by total assets. *C-corporation* is a dummy variable indicating that the firm is organized as a C-corporation. *Firm age* is the number of years that the firm has been doing business under current ownership. Return on assets is profit divided by total assets. *Firm does business locally* is a dummy variable indicating that the firm primarily does business in the metropolitan area where it is located (as opposed to regionally, nationally or internationally). *Firm operates at multiple sites* is a dummy variable, indicating that the firm does business at two or more sites. *Firm uses pension or brokerage services* is a dummy variable, indicating that the firm obtains either pension services or brokerage services from a financial institution. *CEO ownership* is the percentage of the firm owned by the principal owner. *CEO age* is the age of the principal owner. *CEO age squared* is the square of CEO age. *CEO has graduate degree* and *CEO has college degree* are dummy variables, indicating the highest educational attainment of the principal owner. *CEO is female* is a dummy variable, indicating that the principal owner is female. *Industry controls* indicates that the model specification includes a set of nine dummy variables, indicating the firm's one-digit standard industrial classification. Absolute values of *t*-statistics based upon robust standard errors appear in parentheses

? indicates that the expected sign is neither positive or negative

**, * Statistical significance at the 0.01 and 0.05 levels, respectively

for both the 1993 and 2003 samples, executive pay at privately held firms varies by industry, even after controlling for firm size. For 1993, six of the eight included industry indicator variables are statistically significant at the 0.05 level or better, with two being positive and four being negative. Pay is highest for Professional Services firms and lowest for Retail Trade firms. For 2003, six of the eight included industry indicator variables are statistically significant at the 0.05 level or better, with five being positive and one being negative. As in 1993, pay is highest for Professional Services firms and lowest for Retail Trade firms.

We then augment the specification, first with a set of firm characteristics and then with a set of owner characteristics. This enables us to provide evidence regarding the relative importance of these variables in explaining executive pay at privately held firms.

In column (1) of Table 6, we include not only firm size and industry, but also additional firm characteristics—leverage as measured by the ratio of debt to assets, a dummy variable identifying C-corporations, firm age, firm profitability as measured by return on assets, and three dummy variables indicating whether the firm does business locally as opposed to regionally, nationally or internationally, whether the firm operates at multiple sites and whether the firm uses pension or brokerage services.

As shown in column (1), which is based upon the 1993 SSBF, only firm sales, leverage and the dummies for C-corporations and for firms using pension or brokerage services are significant at better than the 0.05 level. More highly levered firms pay significantly lower compensation, supporting our hypothesis that CEOs enhance their job security by extracting less pay as leverage increases. C-corporations pay significantly higher compensation, which supports our hypothesis that double taxation of income at C-corporations leads their managers to prefer salary compensation over dividend income. Executive pay is significantly higher at firms using pension or brokerage services, supportive of our hypothesis that executive pay is higher at more complex firms, even after controlling for firm size.

In column (2) of Table 6, which is based upon the 2003 SSBF firms, firm sales and the dummies both for C-corporations and for firms using pension and brokerage services remain positive and significant, but the leverage ratio loses significance. In its place,

the D&B credit score is positive and significant, indicating that firms with better credit scores pay significantly higher executive compensation.[20] This also is consistent with our hypothesis that CEOs look after their job security by extracting less compensation as the probability of financial distress increases. Return on assets is negative and significant, which is consistent with the substitution of salary for dividends. Finally, the dummy variable for firms that only do business locally is negative and the dummy for multiple sites is positive, as expected, but neither is statistically significant.

Also included in these specifications is 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. In general, executive pay in the Professional Services industry is significantly higher than those in other industries.

In columns (3) and (4) of Table 6, we add to firm size and industry a set of six variables related to the characteristics of the CEO—percentage ownership, age and the square of age, dummy variables indicating whether the CEO had a college or graduate degree and a dummy variable indicating the gender of the CEO. Each of these six variables is statistically significant at better than the 0.10 level for both samples, with the sole exception of the 1993 College dummy.

Executive pay declines with CEO ownership, falling by 4.2–5.6 % for each 10 % point increase in CEO ownership. This is consistent with our hypothesis that distributing income to a CEO through a dividend becomes less costly to the company 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.

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 term and a significant positive age term. We run an additional regression (not shown) that includes only the age and age-square terms in order to

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[20] The D&B credit score is not available from the 1993 SSBF. When the credit score is omitted from this specification using the 2003 sample, the leverage ratio becomes negative and statistically significant at the 0.01 level, consistent with our finding for the 1993 sample.

find the age of maximum CEO pay. This regression reveals that executive pay for small privately held corporations reaches a maximum value at an age of 55 years.[21]

We also find that executive 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. The magnitude on the coefficient for gender is −0.13 for 1993 and −0.26 for 2003, which indicates that female CEOs earn approximately 13–26 % 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) were unable to perform a meaningful analysis of gender differences, as less than one percent of their ExecuComp sample of CEOs and Chairpersons were female. For executives at all levels, they found that females constitute 2.5 % 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 and VP).[22] In our 1993 (2003) sample, more than 15 (20) percent of the firms are headed by a female CEO. CEOs with college degrees earn 4–6 % more, while CEOs with graduate degrees earn 8–25 % more than CEOs with less than a college degree.

In columns (5) and (6) of Table 6, we include both the firm characteristics and CEO characteristics. In general, the results are qualitatively unchanged from those presented in columns (1)–(4), with the same variables retaining statistical significance in each sample, so we do not discuss them further.

One potential criticism of our results is that officer compensation may cover pay to not only the firm's CEO but also to other corporate officers, if there are any. For most small private firms, this is highly unlikely, but is less so for the larger private firms. One way to mitigate this concern is to examine firms where the CEO owns 100 % of the firm's shares, making it unlikely that there are multiple corporate officers

across which to aggregate officers' pay—our measure of executive compensation. There are 456 of these firms in the 1993 sample and 640 in the 2003 sample. We re-estimate the specification shown in columns (5) and (6) of Table 6 based upon these subsamples of firms. As shown in columns (7) and (8) of Table 6, the results are, for the most part, qualitatively unaffected by this rather severe restriction on our sample. Only the variables for firm age and return on assets lose statistical significance in the 2003 sample. This robustness test strongly suggests that our results are not driven by aggregation of executive pay at firms with multiple officers.

7 Summary and conclusions

In this study, we extend the literature on executive compensation by using data from the nationally representative 1993 and 2003 Surveys of Small Businesses to analyze executive compensation at small privately held corporations; for comparison purposes, we also provide new evidence on executive pay at a hand-collected sample of the smallest publicly traded corporations and at large publicly traded corporations followed by ExecuComp. Our new evidence is important because private firms are such an important part of the economy and because differences in the ownership and governance structures of private and public corporations suggest that determinants of CEO compensation also should differ. In particular, the typical majority ownership stake of CEOs at private firms provides far different incentives and agency considerations than does the typical CEO ownership stake of less than one percent at public companies. Moreover, the vast majority of existing empirical evidence on executive pay comes from analysis of the large public companies covered by the ExecuComp database.

By comparing pay across the two surveys, we find that median-inflation-adjusted CEO pay declined from 1993 to 2003. This stands in stark contrast to the more than tripling of pay at CEOs of the S&P 500 during the 1992–2001 reported by Murphy (2012).

Our analysis also reveals that some of the stylized facts about executive pay established by studies of publicly traded firms also hold true for privately held firms, but others do not. For example, the level of executive pay is higher at larger private firms and varies widely by industry, but the well-documented

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[21] The coefficients from this regression correspond to a quadratic equation. Taking the first derivative and setting it equal to zero, we solve for the implied maximum value of age.

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

increase in executive pay observed at large public firms during the past two decades has not occurred at private firms, or even at the smallest public firms. We also find that the 0.30 benchmark pay-size elasticity that has been widely documented at publicly traded firms does not hold for privately held firms; instead we find that the pay-size elasticities for private firms is much higher, in the range of 0.50.

Third, our analysis of the determinants of executive pay at private companies explains almost half of the variability in executive compensation at private firms and reveals that, by far, the most important determinant of executive pay at private firms is firm size as measured by annual sales. 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 reduce double taxation of income that normally would be distributed as dividends.

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.

We find that executive pay is inversely related to either leverage as measured by the ratio of total loans to total assets or credit quality as measured by the D&B credit score. This finding supports our hypotheses that CEO pay at privately held firms is, in large part, a conduit for distribution residual cash flows and that CEOs of such firms adjust their compensation in order to meet debt service obligations and reduce the costs of borrowing and/or financial distress.

Finally, we find that executive pay is related to a number of CEO characteristics, including age, education and gender. We find a quadratic relation 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 an 11–27 % premium and college degrees providing a 3–18 % 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. This is consistent with the growing literature establishing that women are more risk averse in their investment behavior; by leaving money in the firm, these executives are avoiding an increase in firm leverage and therefore the probability of financial distress.

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 private corporations go about setting compensation (e.g., do they seek out market comparables in setting pay, as at larger firms?) and how pay practices differ at the larger privately held firms that may go public in their future. We leave these questions for future researchers who, hopefully, will have access to more detailed data on the governance structures of private companies.

Our study should be of value to numerous different constituencies. Our benchmarks of CEO pay by firm size should assist managers of private firms in setting their own levels of pay and assist investors in assessing whether CEOs of private firms are too high or too low. Our findings on the change in pay over time for large public, small public and private firms should assist regulators as they attempt to formulate policies to address (potentially) excessive executive compensation at the large public firms. Finally, our findings should assist all of these (and other) clienteles in assessing the validity of the numerous non-representative surveys of compensation at private firms that have proliferated in recent years.

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