THE EFFECT OF CEO PAY ON FIRM VALUATION IN CLOSELY HELD FIRMS

Ronen Barak, Shmuel Cohen and Beni Lauterbach

ABSTRACT

We collect data on CEO pay in 122 closely held firms traded on the Tel-Aviv Stock Exchange during 1995–2001. After estimating CEO pay performance sensitivity and CEO "excess pay," we examine how these two pay attributes affect end of period (year 2001) Tobin's Q. Our main findings and conclusions are that (1) when CEO is from the controlling family, the end of period Q is negatively correlated with "excess" pay – "excess" pay to family-CEOs appears like a form of private benefits; (2) when a professional nonowner CEO runs the firm, end of period Q is positively correlated with CEO pay performance sensitivity – incentives to professional CEOs help promote firm value.

Keywords: CEO compensation; excess compensation; ownership structure; owner CEO; family firms

JEL Codes: G30; G32; G34

International Corporate Governance
Advances in Financial Economics, Volume 14, 19–42

ISSN: 1569-3732/doi:10.1108/S1569-3732(2011)0000014004

1. INTRODUCTION

Existing research on CEO pay focuses on disperse ownership firms. In such firms, the main compensation-related problem is the design of a pay contract that would motivate the professional CEO to exert efforts and would align CEO interests with those of the shareholders. The widely adopted theoretical and practical solution is to offer the CEO a relatively high level of compensation (see Rosen, 1982) and make CEO pay performance sensitive, that is directly dependent on the company stock price performance (Jensen & Meckling, 1976).

In practice, however, these optimal pay solutions had dubious effects. The professional CEOs accumulated power and maneuvered the board of directors into awarding them extremely generous pay contracts (see Bebchuk & Fried, 2004) and "too large" option grants that occasionally perplexed the CEOs and led them to immoral behavior (see Jensen, 2004).

This study focuses on CEOs in closely held firms. In such firms, the problem of a misbehaving professional CEO is mitigated because the firm owners closely monitor the professional CEO actions. However, a new agency problem emerges. When an owner who controls the firm serves also as its CEO, this owner CEO can pay himself inflated unjustified pay. Any such excessive compensation to the owner CEO decreases the market value of the firm at the expense of small public investors.[1] The final outcome, in an economy where excessive pay to owner CEO is possible and common, is lack of investors trust in the publicly traded companies, difficulties in capital raising, shrinking investments, and less economic growth. Castro, Clementi, and MacDonald (2004) provide theory and evidence on the positive effect of investor protection on economic growth.

Studying the level and economic effects of CEO pay in closely held firms is practically important because most of the globe's firms are closely held. Surprisingly, there is only little previous research on CEO pay in closely held firms. Given the voluminous literature on CEO pay in disperse ownership firms, it is puzzling that the issues of pay and incentives in closely held firms have been largely overlooked. Research on owner-CEO pay in closely held firms may also contribute to ongoing theoretical debates, for example, to the debate on the extent to which CEO's relatively high pay is due to her outstanding talent or to her unique power and ability to exploit the firm. We believe that in closely held firms the impact of owner CEO talent and the impact of her power to exploit the firm are intensified. Hence, those factors may become more easily observable in our closely held firms sample.

There exists evidence that owner CEOs earn higher pay (Holderness & Sheehan, 1988) and that owners (termed "large shareholders" or "principals" in some of the previous literature) restrict nonowner CEO pay (Core, Holthausen, & Larcker, 1999) and decrease the "pay for luck" component (Bertrand & Mullainathan, 2001). However, some new updated evidence on owner-CEO pay is definitely needed, and we could not find any previous study on our focal point – the impact of CEO pay on firm valuation in closely held firms.

In a sample of 122 Israeli CEOs who served their closely held publicly traded firms continuously during 1995–2001, we find that (1) in family controlled firms, paying excessive compensation to an owner (i.e., family member) CEO significantly diminishes the market valuation of firm shares and (2) in closely held firms, incentives to nonowner professional CEOs are effective – the higher is the non-owner-CEO pay performance sensitivity, the higher is firm's market value.

The chapter is organized as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the data and methodology. Section 4 presents the empirical results, and Section 5 concludes.

2. CEO COMPENSATION AND FIRM VALUE

2.1. Existing Evidence

The main purpose of this research is to study the effect of CEO pay contract on firm valuation in closely held firms. Prior evidence exists only on disperse ownership firms. This evidence is important because it may be relevant for professional non-owner CEOs in closely held firms, and it could be instructive for methodological design.

Core et al. (1999) study a sample of 205 US companies during 1982–1984 and estimate "excess compensation" as the contribution of board of directors properties and ownership structure characteristics to CEO pay. This excess compensation estimate has a significantly negative impact on future accounting measures (ROA) as well as on market performance (stock's return). Their conclusion is that weak governance affords excess compensation to CEOs at the expense of firm public shareholders.

Brick, Palmon, & Wald (2006) estimate excess compensation in a different way, as the residual in the CEO pay equation. Yet, their conclusions are similar to that of Core et al. – excess CEO compensation is associated with firm stock price underperformance. Brick et al. also find a positive

correlation between CEO and directors excess pay, which suggests that directors and CEO cooperate in expropriating firm shareholders.[2]

An opposite view also exists. According to this view, excess compensation reflects CEO quality. Our models for CEO pay are incomplete, and the explanatory variables we use cannot capture the full compensation for CEO quality. Hence, the residual in the CEO pay equation (CEO excess pay) embeds a pay for quality component. Higher quality CEOs would tend to have positive residuals (= extra pay), and vice-versa for lower quality CEOs. Furthermore, if the CEO labor market is efficient, CEO pay for quality should be equal or less than CEO contribution to firm value. Thus, "excess" CEO compensation may just indicate a superior quality CEO who should improve (rather than hurt) firm performance and market valuation. Excess pay CEOs help promote firm value.

Ang, Lauterbach, and Vu (2003) study the impact of excess compensation to newly appointed CEOs. They define excess compensation as the unexplainable (residual) component in a predictive CEO equation and document a significant positive relation between this excess compensation measure and stock price response to the new CEO appointment. Firm future accounting performance measures, such as return on total assets (ROA) and return on equity (ROE) are also positively correlated with excess pay. Ang et al. (2003) conclude that the CEO labor market is efficient – it offers better qualified CEOs more generous pay contracts, which eventually improves firm's long-run performance.

Hayes and Schaefer (2000) develop a formal framework for examining the effects of "unobservable" CEO performance, where "unobservable" denotes performance that was not reflected in current year accounting numbers and went unnoticed by the market. In fact, "unobservable" CEO performance is synonym with CEO quality. If the board of directors recognizes and rewards the CEO for her "unobservable" performance (quality), then a positive correlation emerges between the current unexplained CEO pay ("excess" pay) and future firm performance. This is because "unobservable" CEO performance or quality should pay off in the future. Hayes and Schaefer (2000) document such a significant positive relation (between CEO "excess" pay and future firm ROE) in a sample of US firms collected from the Forbes Executive Compensation Surveys (1974–1995).

Another positive view on the effect of CEO compensation package on firm value is found in Morgan and Poulsen (2001). They report that in the 1990s proxy statements of S&P 500 firms proposing pay for performance compensation schemes were favorably received by the stock market, especially when the plan were directed towards the firm's top executives.

Providing incentives to top management appears to promote executives' efforts and increases shareholders' wealth. This conclusion is supported by Mehran (1995) who documents that firm's Q is positively correlated with the percentage of CEO pay that is equity-based. Apparently, nonowner CEOs in the United States with a more performance-sensitive pay (higher proportion of equity based compensation) have better incentives and are more successful in increasing firm value.

2.2. Hypotheses

In closely held firms, it is likely that the owner CEO extracts some excess compensation as part of her private benefits' consumption. This excess compensation most probably decreases firm market value and long-term valuation (Tobin's Q). Thus.

Hypothesis 1. In closely held firms, "excess" owner-CEO compensation decreases firm's long-run market value (end of period Tobin's Q).

Differences may exist between owner CEOs in family firms and owner CEOs in "partnership" firms (where a few partners together control the firm). This is because it appears easier to coordinate private benefits divisions within families – families appear more cohesive and more stable than "partnerships." In a "partnership," there might be more mutual "monitoring" and less leeway for generous excessive pay to the owner CEO – see Bennedsen and Wolfenzon (2000). In the empirical work, we examine differences between family and nonfamily owner CEOs.

Also interesting are the valuation effects of "excess" non owner CEOs' pay. In closely held firms the hired professional CEOs are closely monitored by firm control holders who most probably pursue some optimal contracting schemes for them. Efficient contracting of professional CEOs dictates some extra pay for CEOs with superior quality. In turn, these superior quality professional CEOs reward their firms by enhancing firms' long-term value.[3] In sum, it is likely that the surplus generated by a superior quality professional CEO is divided between CEO (receiving "excess" pay) and the firm (whose value increases). Hence.

Hypothesis 2. In closely held firms "excess" non-owner-CEO compensation increases firm's long-run market value (end of period Tobin's Q).

Economic logic also suggests that (all other things equal) competent professional CEOs would receive larger incentives – a relatively high pay

performance sensitivity commensurate with their higher marginal product. Thus,

Hypothesis 3. In closely held firms, non-owner-CEO pay sensitivity to performance is positively associated with firm's long-run market value (end of period Tobin's Q).

Hypothesis 3 can also be derived without the assumptions of economic efficiency and equilibrium. Suppose firm owners are reluctant (psychologically or for other reason) to large bonuses and generous pay for performance to their hired CEOs. In such inefficient environments, increasing pay for performance would stimulate non-owner CEOs to work harder which contributes to firm value. We should remember that large pay for performance for CEOs has become popular and prevalent only in the recent decade or two. Before the 1990s, pay performance sensitivity appeared low – see Jensen and Murphy (1990). Thus, we cannot be sure that we are or were at the optimal pay for performance level. If CEOs in our sample were not yet at the adequate pay for performance levels, then Hypothesis 3 holds, that is, firms that dared providing their professional CEOs higher pay performance sensitivity achieved higher market valuations (all other things equal).

Last, trying to make predictions about the effect of owner-CEO pay performance sensitivity is treacherous. The owner CEO has a substantial exposure to firm performance due to her large holdings in company stocks, which overwhelm her pay sensitivity as CEO. Pay (received from the firm) performance sensitivity may be inconsequential. In addition, firm success also most probably affords higher (nonmeasurable) private benefits extraction by the owner CEO, which reduces firm's market value. Thus, even if pay performance sensitivity induces owner CEO to work and increase firm value, the market value of the firm may decrease because of larger private benefits consumption. We refrain from putting forth any hypothesis regarding the impact of owner CEO pay sensitivity on firm's Tobin Q.

3. DATA AND METHODOLOGY

3.1. Sample Selection and Variables' Construction

The study employs data from Israel for three main reasons. First, previous evidence is based on the United States, an economy with relatively few

closely held firms (see, however, Holderness, 2009). We sought data from an economy where closely held firms are predominant, and Israel fits this criterion (over 90% of publicly traded firms in Israel are closely held). Arguably, a closely held firm economy such as Israel is a more natural and representative environment for studying the effects of owner CEO pay contract. Second, Israel may also be considered as a typical closely held firm economy. Laporta, Lopez-De-Silanes, Shleifer, and Vishny (1998) rank Israel at about median in investor protection and Dyck and Zingales (2004) suggests private benefits in Israel are above median. Hence, results from Israel could be "about representative." Last, in Israel we found relatively high-quality data on all needed variables, which made the study feasible.

The sample comprises all the Tel-Aviv Stock Exchange (TASE) companies that (1) continuously traded during 1994–2001,[4] (2) did not replace their CEO during that period, (3) published CEO pay in each year during the sample period, and (4) did not undergo any substantial ownership change during the period.[5] These exclusions should reduce measurement noise, assuring that firm's terminal value (Q) is caused by a particular CEO acting under a certain stable ownership structure.

Our clean final sample comprises 122 firms.[6] For those firms we collect data from several commercial databases. Financial data (total assets, market value, equity, net income, and leverage) are from "Super-Analyst"; ownership and board of directors' composition are from the company reports, electronically available on "IFAT"; and stock return data are from "PREDICTA." Last, CEO pay, age, and education are retrieved from annual tables published by Globes (a leading business newspaper in Israel).

To estimate the long-run impact of CEO pay on firm valuation, we need a measure of end of period valuation. Thus, we calculate for each firm its Tobin Q at the end of 2001 (the last year in our sample), where Q is defined as follows:

$$Q = \frac{\text{market value of equity} + \text{book value of debt}}{\text{book value of total assets}} \tag{1}$$

Also noteworthy are our ownership structure classifications. On the basis of the company ownership reports (Article 24 in its annual report), which are relatively detailed in Israel and reveal all relations and agreements between firm large shareholders, we classify a CEO as owner CEO (non-owner CEO) if she belongs (does not belong) to the family or coalition that controls the firm, where control means possession of more than 50% of the vote. Within the owner-CEO category, we further distinguish between an

owner CEO in a family-controlled firm and owner CEO in a firm controlled by several (usually two or three) business partners.

The standard deviation of the company daily stock returns during 1995–2001 is our proxy for firm risk. Financial leverage is defined as book debt over total assets. The CEO education dummy variable equals 1 when the CEO has an official academic degree and 0 otherwise. ROE is net profits divided by total assets. Last, firm's growth potential is approximated by annual average growth rate in firm's Total Assets (TA) during 1995–2001, calculated as $\mathrm{Ln}(\mathrm{TA}_{2001}/\mathrm{TA}_{1994})/7$.

3.2. *Methodology*

Our main goal is to investigate the impact of CEO compensation on firm long-run valuation. We focus on two central aspects of compensation contracts: the CEO pay level and its sensitivity to performance.

3.2.1. *"Excess Pay" and Pay Sensitivity Estimation*

To study the impact of CEO pay level, we adopt Ang et al. (2003) and Brick et al. (2006) approach and define "excess compensation" as the residual in a predictive CEO pay equation. There are two possible interpretations of such a residual. First, the residual may stem from CEO extra quality. It is difficult to parametrically define and measure CEO quality. Some important qualitative factors, observed only by firm insiders and firm board of directors, considerably affect CEO appointment and pay level. These soft qualitative factors cannot be described in a regression equation; hence, they are captured by the regression residuals. The second possible interpretation of the regression residual is that it represents a governance failure-the residual is the overpayment to the CEO, and it should have a long-run value-diminishing effect.[7]

The predictive CEO pay equation we use is:

$$\begin{aligned}\mathrm{Ln}(W_{it}) = {} & \beta_0 + \beta_1 \mathrm{RET}_{it} + \beta_2 \mathrm{RET}_{it-1} + \beta_3 \mathrm{Lnsize}_{it} + \beta_4 \mathrm{Ln}(W_{it-1}) \\ & + \beta_5 \mathrm{nonowner}_i + \beta_6(\mathrm{nonowner}_i \mathrm{RET}_{it-1}) + \beta_7(\mathrm{nonowner}_i \mathrm{RET}_{it}) \\ & + \beta_8 \mathrm{Lev}_{it} + \beta_9 \mathrm{director}_i + \beta_{10} \mathrm{risk}_i + \beta_{11} \mathrm{institution}_i + \beta_{12} \mathrm{age}_i \\ & + \beta_{13} \mathrm{education}_i + \Psi_{\mathrm{ind}} \mathrm{Dumindustry}_i + \tau_{\mathrm{year}} \mathrm{Dumyear}_t + \varepsilon_{it} \end{aligned} \quad (2)$$

where W_{it} is the annual pay of firm i CEO in year t; RET_{it} and RET_{it-1} are the annual stock returns in years t and $t-1$, respectively; $\mathrm{Nonowner}_i$ is a dummy variable equal to 1 for nonowner CEOs, and 0 otherwise; Lev_{it} and

Lnsize_{it} are firm leverage and natural logarithm of firm total assets at the end of year t respectively; director_i is the proportion of the external directors on the firm's board; risk_i is the standard deviation of the daily stock return over 1995–2001; institution_i is the institutional investor holdings; age_i is the average CEO age, and education_i is a dummy variable equal to 1 when the CEO has an academic degree and 0 otherwise; $\Psi_{\text{ind}}*\text{Dumindustry}_i$ represents the industry fixed effect of firm i, and $\tau_{\text{year}}*\text{Dumyear}_t$ controls for each calendar year fixed effect.

Regression (2) is a "pooled" time-series cross-section ("panel data") regression with fixed effects for industry and calendar year. It controls for the host of variables that affect CEO pay (Section 2.1) including current and previous year stock return, CEO type (owner vs. non-owner CEO), governance factors (external directors and institutional holdings), firm size and risk, and CEO age and education. It also includes the previous-year CEO pay as a "catch-all" explanatory variable, designed to proxy for the impact of the omitted (unknown to us) pertinent explanatory variables.

After controlling for all above-specified variables, we estimate the "excess" CEO pay in firm i as the average residual of firm i in regression (2), that is, as the average ε_{it} across the sample years (average across t).

An alternative to the above estimation method is to estimate "excess pay" in firm i as the residual (η_i) in the following regression of average CEO pay:

$$\begin{aligned}\text{Ln}(\overline{W_i}) = {} & \beta_0 + \beta_1\overline{\text{RET}_i} + \beta_2\overline{\text{Lnsize}_i} + \beta_3\text{non-owner}_i + \beta_4\text{director}_i \\ & + \beta_5\text{risk}_i + \beta_6\text{institution}_i + \beta_7\text{age}_i + \beta_8\text{education}_i \\ & + \beta_9\overline{\text{Lev}_i} + \Psi_{\text{ind}}\text{Dumindustry}_i + \eta_i \qquad (3)\end{aligned}$$

Regression (3) is a standard cross-sectional regression, with one observation for each firm – each firm is represented by its average values over 1995–2001. that is, W_i is the mean CEO pay in firm i over 1995–2001, and so forth. The estimation of excess pay through regression (3) serves for robustness purposes. (It does not include lagged pay as an explanatory variable.)

Our next goal is to estimate each CEO's pay performance sensitivity. We adopt Murphy's (1999) methodology and fit, for each firm i, the following time-series regression:

$$(W_t/W_{t-1}) = a_i + b_i\text{RET}_{t-1} + c_i\text{RET}_t + e_i \qquad (4)$$

where W_t is firm's i CEO pay in year t and RET_t is firm's i stock return[8] in year t. The sum of coefficient $b_i + c_i$ measure the elasticity of CEO pay with respect to share price, which is the percentage increase in CEO pay in year t in response to a 1% increase in firm's share price in year t and $t+1$.

3.2.2. Tobin's Q analysis

Before examining the effect of pay characteristics on Q, we identify some control variables, that is, variables that are customary in explaining firm's Tobin's Q. On the basis of prior literature, we use the following control variables: firm ownership structure, size, growth rate, financial leverage, risk, and the percentage of external directors on the board. The list of controls used is not exhaustive – see Himmelberg, Hubbard, and Palia (1999), for example, for some additional variables based on firm's R&D activity, advertising expenses and capital intensity, which are not available to us. Nevertheless, the controls employed should help in achieving a more credible inference on the effect of pay characteristics on firm's end of period Q.

The Q regression we run is:

$$\begin{aligned}\mathrm{Ln}(Q_i) = {} & \alpha_1 * \mathrm{family}_i + \alpha_2 * \mathrm{partner}_i + \alpha_3 * \mathrm{non\text{-}owner}_i \\ & + \alpha_4 * \mathrm{family}_i * \mathrm{excess\_comp}_i + \alpha_5 * \mathrm{partner}_i * \mathrm{excess\_comp}_i \\ & + \alpha_6 * \mathrm{non\text{-}owner}_i * \mathrm{excess\_comp}_i \\ & + \alpha_7 * \mathrm{family}_i * \mathrm{pay\_sensitivity}_i \\ & + \alpha_8 * \mathrm{partner}_i * \mathrm{pay\_sensitivity}_i \\ & + \alpha_9 * \mathrm{non\text{-}owner}_i * \mathrm{pay\_sensitivity}_i \\ & + \alpha_{10} * \overline{\mathrm{Lnsize}_i} + \alpha_{11} * \overline{\mathrm{Lev}_i} + \alpha_{12} * \mathrm{growth}_i + \alpha_{13} * \mathrm{director}_i \\ & + \alpha_{14} * \mathrm{risk}_i + \Psi_{\mathrm{ind}} * \mathrm{Dumindustry}_i + e_i \end{aligned} \quad (5)$$

where $\mathrm{Ln}(Q_i)$ is the natural logarithm of firm's Tobin's Q at the end of the sample period (2001); family is a dummy variable equal to 1 if the CEO family has full control (hold more than 50% of voting power) in the firm (otherwise family = 0); partner is a dummy variable equal to 1 if the CEO and her/his business partners together control the firm (otherwise partner = 0); non-owner is a dummy variable equal to 1 if the CEO is an employee, owns less than 5% of firm equity and does not belong to the control group (otherwise non-owner = 0); excess_comp is an estimate of CEO excess compensation using Eq. (2) or (3); pay_sensitivity is CEO pay sensitivity estimated using Eq. (4); Lev is total debt to total assets ratio; Lnsize is the natural logarithm of total assets; growth is the average yearly growth in firm size (total assets) over 1995–2001, computed as $(\mathrm{LnSize}_{i2001} - \mathrm{LnSize}_{i1994})/7$; director is the percentage of external directors on the board; risk is the daily stock return standard deviation over 1995–2001; and Dumindustry is a dummy variable for the industry sector of the firm.

4. EMPIRICAL RESULTS

4.1. Sample Description and CEO Pay

Table 1 describes the sample. The mean (median) annual CEO pay is 1.25 (1.03) millions New Israeli Shekels (NIS) – about $314,000 ($259,000) given the average NIS/US$ exchange rate of 3.978 over the sample period. The sample comprises 54 owner CEOs in family controlled firms, 35 owner CEOs in partnership firms and 33 non-owner CEOs. Hence, about 73% of the sample firms are run by owner CEOs.

The mean total assets is 428 million NIS, with observations ranging from 4.34 millions NIS (lowest) to about 34.5 billion NIS. Our sample firms are also heterogeneous in their industry affiliation, and in a formal test (not shown), we find that their cross-industry distribution represents well the corresponding distribution of all companies traded on the TASE.

The average (median) ROE and annual stock return are 4% (5%) and 9% (6%), respectively. These relatively modest profitability indicators stem from the fact that most of the sample years were poor performance years in Israel. The mean company risk (approximated by the daily standard deviation of company stock) is 3.1%.

External directors comprise, on average, close to 30% of firms' boards. The average (median) institutional investors' holdings is only 2.4% (0%), hence in more than half of the sample firms there are no institutional investors at all. Firms' debt is, on average, more than 50% of total assets. The mean CEO age is 54, and about two-thirds of CEOs have an academic degree.

Table 2 presents the results of predictive CEO pay regressions, which we use for estimating CEO excess compensation. For a few variables, most notably the CEO compensation, we use the natural logarithm transformation, to mitigate deviations from the Normal distribution. In addition, since firm risk, leverage and external directors' proportion are highly correlated with firm size (Pearson correlations higher than 0.5), we regress these 3 variables (separately) on Ln(size), and use the residuals of these 3 regressions as explanatory variables in the predictive CEO pay regressions (Eq. (2)).

Panel A documents the pooled cross sectional time series panel data regression results with industry and calendar year fixed effect. We start with a full model controlling for various economic and governance determinants of CEO compensation. As expected, CEO pay is positively correlated with firm size (CEOs in larger firms receive higher pay) and stock return performance (CEO pay is performance sensitive). The positive correlation

Table 1. Sample Descriptive Statistics.

	Average	Standard Deviation	Median	Minimum	Maximum	Number of Observations
Annual CEO pay (in million NIS)[a]	1.25	0.85	1.03	0.32	5.97	122
Owner CEO (= 1 for owner CEO, and 0 otherwise)[b,d]	0.73	0.45	1	0	1	122
Partner CEO (= 1 for partner CEO, and 0 otherwise)[b,d]	0.28	0.45	0	0	1	122
Firm book value of equity (in million NIS)[a]	198	835	55	−6.23	8,888	122
Firm market value of equity (in million NIS)[a]	227	857	59.3	5.64	9,009	122
Q ratio[e]	1.097	0.322	1.009	0.389	2.248	122
Annual growth rate of firm's total assets[a]	0.107	0.13	0.09	−0.217	0.553	122
Net profit (in million NIS)[a]	18.25	91.01	3.11	−8.44	979	122
Return on equity[a,f]	0.04	0.17	0.05	−1.14	0.69	122
Annual stock return[a]	0.09	0.26	0.06	−0.25	1.97	122
Total assets (in million NIS)[a]	428	3184	22.6	4.34	34,444	122
Daily stock return standard deviation (%)[c]	3.14	0.65	3.11	1.77	5.89	122
External directors proportion on firm's board of directors[b]	0.29	0.03	0.3	0.12	0.33	122
Leverage (book debt over total assets ratio)[a]	0.56	0.11	0.54	0.41	1.09	122
Institutional investor holdings[b]	0.024	0.037	0	0	0.19	122
CEO age (in years)[a]	54	8	54	34	78	122
CEO education (= 1 for an academic degree, and 0 otherwise)[b]	0.67	0.47	1	0	1	122

Note: The sample comprises 122 publicly traded Israeli firms that did not replace their CEO over 1995–2001.
[a]Calculated over 7 years (1995–2001).
[b]Calculated over two years (1995 and 2001).
[c]The standard deviation of a daily stock return during 1995–2001.
[d]The sample comprises 54 family owner CEOs, 35 partnership owner CEOs, and 33 non-owner CEOs.
[e]Calculated at the end of 2001, as market value of equity + book value of debt over book value of assets.
[f]Calculated as net profits divided by book value of equity.

Table 2. Predictive CEO Pay Equations – Estimating CEO Excess Compensation.

	Full model	Parsimonious version
Panel A: Regression (1) estimates		
Intercept	0.749***	0.752***
	(6.49)	(9.28)
RET_{t-1}	0.057***	0.059***
	(4.08)	(4.27)
RET_t	0.058***	0.059***
	(4.18)	(4.31)
$Lnsize_t$	0.071***	0.070***
	(6.51)	(6.45)
$Ln(W_{it-1})$	0.725***	0.739***
	(31.9)	(33.67)
Nonowner	−0.098***	−0.086***
	(−3.30)	(−3.16)
Director	0.182	
	(1.22)	
Risk	−0.037	
	(−1.61)	
Lev_t	−0.060	
	(−0.81)	
Institution	0.269	
	(0.86)	
Age	−0.00055	
	(−0.37)	
Education	0.0092	
	(0.37)	
Nonowner*RET_{t-1}	0.063	
	(1.34)	
Nonowner*RET_t	0.032	
	(0.66)	
Adjusted R^2	0.782	0.782
Panel B: Regression (2) estimates		
Intercept	−2.555***	−2.399***
	(−7.58)	(−11.42)
RET	0.515***	0.491***
	(2.76)	(2.72)
Lnsize	0.269***	0.274***
	(7.02)	(7.55)
Nonowner	−0.437**	−0.389***
	(−4.09)	(−3.99)
Director	1.069**	1.028**
	(2.12)	(2.00)
Risk	−0.168**	−0.200***
	(−2.06)	(−2.74)

Table 2. *(Continued)*

	Full model	Parsimonious version
Age	0.0018	
	(0.33)	
Education	0.126	
	(1.36)	
Lev_t	−0.277	
	(−1.04)	
Institution	0.065	
	−0.06	
Adjusted R^2	0.465	0.467

Notes: We estimate two regression models:

$$\begin{aligned}\text{Ln}(W_{it}) = {} & \beta_0 + \beta_1 * \text{RET}_{it} + \beta_2 * \text{RET}_{it-1} + \beta_3 * \text{Lnsize}_{it} + \beta_4 * \text{Ln}(W_{it-1}) + \beta_5 * \text{Nonowner}_i \\ & + \beta_6 * (\text{Nonowner}_i * \text{RET}_{it-1}) + \beta_7 * (\text{Nonowner}_i * \text{RET}_{it}) + \beta_8 * \text{Lev}_{it} \\ & + \beta_9 * \text{Director}_i + \beta_{10} * \text{Risk}_i + \beta_{11} * \text{Institution}_i + \beta_{12} * \text{Age}_i + \beta_{13} * \text{Education}_i \\ & + \Psi_{ind} * \text{Dumindustry}_i + \tau_{year} * \text{Dumyear}_t + \varepsilon_{it} \end{aligned} \quad (1)$$

where W_{it} is the annual pay of firm i CEO in year t. RET_{it} and RET_{it-1} are the annual stock returns in years t and $t-1$, respectively; nonowner_i is a dummy variable equal to 1 for nonowner CEOs, and 0 otherwise; Lev_{it} and Lnsize_{it} are firm leverage and natural logarithm of firm total assets at the end of year t respectively; director_i is the proportion of the external directors on the firm's board; Risk_i is the standard deviation of the daily stock return over 1995–2001; institution_i is the institutional investor holdings; Age_i is the average CEO age, and education_i is a dummy variable equal to 1 when the CEO has an academic degree and 0 otherwise; Ψ_{ind}*Dumindustry$_i$ represents the industry fixed effect of firm i, and τ_{year}*Dumyear$_t$ controls for each calendar year fixed effect. Regression (1) is a "pooled" time-series cross-section ("panel data") regression.

$$\begin{aligned}\text{Ln}(\overline{W_i}) = {} & \beta_0 + \beta_1 * \overline{\text{RET}_i} + \beta_2 * \overline{\text{Lnsize}_i} + \beta_3 * \text{nonowner}_i + \beta_4 * \text{director}_i \\ & + \beta_5 * \text{risk}_i + \beta_6 * \text{institution}_i + \beta_7 * \text{age}_i + \beta_8 * \text{education}_i \\ & + \beta_9 * \overline{\text{Lev}_i} + \Psi_{\text{ind}} * \text{dumindustry}_i + \eta_i \end{aligned} \quad (2)$$

Regression (2) is a standard cross sectional regression, with one observation for each firm – each firm is represented by its average values over 1995–2001, that is, $\overline{W_i}$ is the mean CEO pay in firm i over 1995–2001, etc.

The sample includes annual data on 122 publicly traded Israeli firms in the 1995–2001 period. The number of observations is 854 (=122*7) and 122 in regression (1) and (2), respectively. To reduce multicolinearity, risk_i, Lev_i, and director_i were regressed first on Lnsize_i and the residuals of these regressions serve as explanatory variables in this table regressions. t-Statistics are shown in parentheses.**Significance at the 5% level; ***Significance at the 1% level.

with previous year CEO pay emanate, in our opinion, from some determinants of CEO pay (such as firm and CEO characteristics), which we miss or do not measure optimally in our predictive equation. These omitted or mis-specified factors may not change much from year to year, hence may be represented by prior year CEO pay. Previous year pay may also represent some stickiness of CEO pay, namely phenomena like partial or "slow" adjustments of CEO pay.

Another important finding in Table 2 is the significant negative coefficient of the nonowner dummy variable. Ceteris-paribus, owner CEOs receive higher compensation than nonowner professional CEOs. This result is hardly surprising, given the larger responsibility and discretion of owner CEOs over their firms, and given the stronger ability of owner CEOs to extract inflated pay.

The other explanatory variables in our predictive pay equation do not contribute to the explanatory power. As Table 2 documents, a parsimonious model including only the above-specified significant variables scores the same "respectable" adjusted R^2 of 0.782 as the full model.

Panel B presents results of cross sectional regressions of average CEO pay. The average CEO pay regression serves for robustness tests, that is, to check whether results obtained through the more elaborate panel data regression methodology persist. As in the panel regression, CEO pay increases with company size and stock performance and is significantly lower for non-owner CEOs. However, due to the omission of lagged CEO compensation, that cannot serve as an explanatory variable in the average CEO pay regressions the explanatory power of the regression falls (adjusted R^2 is 0.465).

Before moving on, our pay sensitivity estimates should be reviewed. The average CEO pay elasticity in our sample, estimated using Eq. (4), is 0.17% – on average, each 1% rise in stock price increases CEO compensation by 0.17%. This pay elasticity is positive and statistically significant, yet, it is lower than in the United States. Murphy (1999) estimates an average pay elasticity of 0.38% for US CEOs.

4.2. Hypotheses Testing

The central task of our research is to assess the impact of CEO excess compensation and pay sensitivity on firm's long-run valuation. We run a cross-sectional regression of end of period (year 2001) Q on CEO excess pay and pay sensitivity using various controls including also industry and calendar year fixed effects – see Eq. (5). The results are shown in Table 3.

Table 3. The Effect of CEO Excess Compensation and Pay Performance Sensitivity on Closely Held Firms' Valuation.

	Regression 1 Version A	Regression 1 Version B	Regression 1 Version C
Family	0.215***	0.184***	0.216***
	(2.69)	(2.78)	(3.24)
Partner	0.254***	0.206***	0.237***
	(2.95)	(2.83)	(3.17)
Nonowner	0.204**	0.12	0.140**
	(2.50)	(1.72)	(1.97)
Family*excess_comp	-0.469**	−0.520**	−0.178**
	(−2.03)	(−2.10)	(−2.21)
Partner*excess_comp	0.328	0.284	0.186
	(0.77)	(0.69)	(1.23)
Nonowner*excess_comp	−0.024	0.12	0.019
	(−0.03)	(0.24)	(0.14)
Family*pay_sensitivity	0.023	0.037	0.048
	(0.53)	(0.96)	(1.25)
Partner*pay_sensitivity	−0.077	−0.084	−0.088
	(−1.03)	(−1.06)	(−1.25)
Nonowner*pay_sensitivity	0.169	0.186	0.187**
	(1.81)	(1.92)	(2.12)
Lnsize	−0.018		
	(−0.93)		
Lev	0.294		
	(1.46)		
Growth	0.026		
	(0.14)		
Director	0.296		
	(0.87)		
Risk	−0.053		
	(−1.66)		
Adjusted R^2	0.082	0.085	0.097

Notes: The sample includes yearly data on 122 publicly traded closely held Israeli firms in the 1995–2001 period.

We present results of the following regression:

$$\begin{aligned}\mathrm{Ln}(Q_i) = {} & \alpha_1 * \mathrm{family}_i + \alpha_2 * \mathrm{partner}_i + \alpha_3 * \mathrm{nonowner}_i \\ & + \alpha_4 * \mathrm{family}_i * \mathrm{excess\_comp}_i + \alpha_5 * \mathrm{partner}_i * \mathrm{excess\_comp}_i \\ & + \alpha_6 * \text{non-owner}_i * \mathrm{excess\_comp}_i + \alpha_7 * \mathrm{family}_i * \mathrm{pay\_sensitivity}_i \\ & + \alpha_8 * \mathrm{partner}_i * \mathrm{pay\_sensitivity}_i + \alpha_9 * \mathrm{nonowner}_i * \mathrm{pay\_sensitivity}_i \\ & + \alpha_{10} * \overline{\mathrm{Lnsize}_i} + \alpha_{11} * \overline{\mathrm{Lev}_i} + \alpha_{12} * \mathrm{growth}_i + \alpha_{13} * \mathrm{director}_i \\ & + \alpha_{14} * \mathrm{risk}_i + \Psi_{\mathrm{ind}} * \mathrm{dumindustry}_i + e_i \end{aligned} \tag{1}$$

where $\mathrm{excess\_comp}_i$ is the average (across 1995–2001) of each company $_{it}$ in the following CEO compensation panel data regression (see Table 2):

$$\begin{aligned}\mathrm{Ln}(W_{it}) = {} & \beta_0 + \beta_1 * \mathrm{RET}_{it} + \beta_2 * \mathrm{RET}_{it-1} + \beta_3 * \mathrm{Lnsize}_{it} + \beta_4 * \mathrm{Ln}(W_{it-1}) \\ & + \beta_5 * \mathrm{nonowner}_{it} + \Psi_{\mathrm{ind}} * \mathrm{Dumindustry}_i + \tau_{\mathrm{year}} * \mathrm{Dumyear}_t + e_{it} \end{aligned} \tag{2}$$

$\mathrm{Ln}(Q_i)$ is the natural logarithm of firm's Tobin's Q at the end of the sample period (2001), and $\mathrm{Ln}(W_{it})$ is the natural logarithm of firm i CEO pay in year t. Family is a dummy variable equal to 1 if the CEO family has full control (hold more than 50% of voting power) in the firm (otherwise family = 0); partner is a dummy variable equal to 1 if the CEO and her/his business partners together control the firm (otherwise partner = 0); nonowner is a dummy variable equal to 1 if the CEO is an employee, owns less than 5% of firm equity and does not belong to the control group (otherwise nonowner = 0); excess_comp (in versions A–B below) is each company's (average) residual in panel regression (2); pay_sensitivity is the sum of coefficients of current and preceding year stock return (RET_{it} and RET_{it-1} respectively) in firm i (time series) regression: $(W_{it} - W_{it-1})/W_{it-1} = a_i + b_i * \mathrm{RET}_{it} + c_i * \mathrm{RET}_{it-1} + e_{it}$; Lev is debt to total assets ratio; Lnsize is the natural logarithm of total assets; growth is the average yearly growth in firm size (total assets) over 1995–2001, computed as $(\mathrm{LnSize}_{i2001} - \mathrm{LnSize}_{i1994})/7$; director is the percentage of external directors on the board; risk is the daily stock return standard deviation over 1995–2001; Dumindustry is a dummy variable for the industry sector of the firm; and Dumyear is a dummy variable for the calendar year. To avoid multicollinearity problems, Lev, risk, and director are "cleaned" from Lnsize effects, that is, in the regressions of this table we use the residuals of regressions of Lev, risk, and director on Lnsize, instead of the raw variables themselves.

Three versions of regression (1) are presented in the table. Version A uses the full Q model – regression (1) above, and excess_comp based on the parsimonious CEO compensation model – regression (2); Version B is the same as A except that it uses a parsimonious Q model. Version C resembles B, except that in it, excess_comp is the residual $_i$ in the following cross-sectional average CEO pay regression, where both dependent and independent variables are averages of yearly observations in the 1995–2001 period (see Table 2):

$$\begin{aligned}\mathrm{Ln}(\overline{W_i}) = {} & \beta_0 + \beta_1 * \overline{\mathrm{RET}_i} + \beta_2 * \overline{\mathrm{Lnsize}_i} + \beta_3 * \mathrm{nonowner}_i \\ & + \beta_4 * \mathrm{director}_i + \beta_5 * \mathrm{risk}_i + \Psi_{\mathrm{ind}} * \mathrm{Dumindustry}_i + \eta_i \end{aligned}$$

t-statistics, corrected for heteroscedasticity using the White method, are presented in parentheses below the coefficients.
**Significance at the 5% level; ***Significance at the 1% level.

4.2.1. Hypothesis 1

The first column of Table 3 (labeled version A) documents regression results for the full Q model, controlling for a host of potential determinants of Q found in previous research. In this regression, the excess pay proxy is the residual of the parsimonious panel data regression reported in Panel A of Table 2. We find that excess compensation to owner CEOs in family firms, hurts end of period Q. This finding supports our Hypothesis 1.

Hypothesis 1 is also upheld by the parsimonious version of the regression – version B in Table 3 and by the robustness test – version C. The essence of the robustness test is to estimate excess compensation in an alternative way. In version C we use the residuals of a cross-sectional regression of average (1995–2001) CEO pay, as our estimates of excess CEO pay. The coefficient of excess pay to family CEO remains negative and statistically significant.[9]

The support of Hypothesis 1 suggests that excess compensation to owner CEOs in family firms is a form of private benefits extracted from the firm by its owner at the expense of small public investors. Apparently, some family CEOs are "rapacious" – they exploit the firm and hurt its market valuation by withdrawing excessive pay.

In an attempt to further investigate this "rapacious CEOs" conjecture, we collect data on family-CEO self-dealing with the company. Self-dealing or "tunneling" are a known way for extracting private benefits from the firm (see, e.g., Djankov, LaPorta, Lopez-De-Silanes, and Shleifer, 2006). The more self-dealing the family CEO engages in the more rapacious we consider her. Data on self-dealing is retrieved from Shareholders General Meetings summary reports. (In Israel, all deals with the controlling shareholders must be approved in such general meetings.)

On average, in our sample, a family firm has 0.40 self-deals per year (median is 0.33). We distinguish between below- and above-median self-dealing firms by generating two dummy variables: High_D equals 1 for firms with above median deals (and equals 0 otherwise), and Low_D equals 1 for firms with below median deals (and equals 0 otherwise). Then, we multiply the CEO excess compensation by High_D and Low_D, and fit the following regression in our subsample of 54 family firms:

$$\begin{aligned} \mathrm{Ln}(Q_i) = \alpha + \beta(\text{excess\_comp} * \text{high\_D})i + \gamma(\text{excess\_comp} * \text{low\_D})_i \\ + \delta\text{pay\_sensitivity}_i + \Psi\text{ind} * \text{Dumindustry}_i + \varepsilon_i \end{aligned} \tag{6}$$

where Q_i is firm's Tobin's Q, (excess_comp*high_D)$_i$ and (excess_comp*low_D)$_i$ are firm's CEO excess return times the high_D and low_D

dummy variables, respectively, Pay_sensitivity$_i$ is an estimate of CEO pay sensitivity, and Dumindustry$_i$ adjusts for industry fixed effects.

When Eq. (6) is fitted with excess compensation estimates based on our panel pay regressions methodology, $\hat{\beta} = -0.81$ (p-value of 0.005), $\hat{\gamma} = -0.17$ (p-value of 0.63), and $\hat{\delta} = 0.04$ (p-value of 0.29). In comparison, when Eq. (6) is fitted with excess compensation estimates based on average pay cross-sectional regressions, $\hat{\beta} = -0.25$ (p-value of 0.007), $\hat{\gamma} = -0.13$ (p-value of 0.27), and $\hat{\delta} = 0.06$ (p-value of 0.11). The negative and significant β coefficient strongly suggests that when the family CEO is more rapacious any excess compensation paid to her is more likely to be due to private benefits; hence it diminishes firm's market value.

Another interesting result in the regressions reported in Table 3 is that in partnership-controlled firms the coefficient of owner-CEO excess pay is statistically insignificant (and even positive). This suggests that in partnership controlled firms there might be some mutual monitoring, and some internal objections to one partner (the CEO) withdrawing inflated pay (see also Bennedsen & Wolfenzon, 2000). Partners in a voting coalition appear to cooperate less successfully than families in extracting private benefits. The conclusion that partnership controlled owners extract less private benefits is consistent with prior evidence such as Volpin (2002) that document a higher Q for partnership controlled firms (relative to family controlled firms).

4.2.2. Hypothesis 2

Hypothesis 2 of our chapter is rejected by the data. Excess compensation to non-owner professional CEOs does not impact firm valuation. Its coefficient in the Q regressions is minute and statistically insignificant. Excess pay to non-owner CEOs appears random and inconsequential. Non-owner professional CEOs who receive positive (negative) excess pay do not appear to be of higher (lower) quality, as they do not, on average, increase (decrease) firm valuation. This evidence contrasts with previous findings in the United States (e.g., Ang et al., 2003; Hayes & Schaefer, 2000) where excess pay is positively correlated with firm future performance. Possible reasons for the difference are (a) the performance variable we investigate, Tobin's Q, is not related to excess pay – previous "excess pay" studies in the United States do not report results for Q, and (b) the market for professional CEOs in a closely held firms' economy with many owner CEOs such as Israel is less developed and less efficient than in the United States.

4.2.3. Hypothesis 3

Hypothesis 3 of the study is weakly supported by version A of our regressions. Non-owner-CEO pay elasticity has a positive effect on firm Q, and its coefficient is almost significant at the 5% level (p-value of 0.07). Hired CEOs in Israeli firms appear more successful in promoting firm value when their compensation schemes are better aligned with firm stock performance.

Further empirical tests reinforce the support for Hypothesis 3. For example, version B in Table 3 presents results of a parsimonious Q regression, after omission of all control variables that lack statistical significance in version A. In version B, the coefficient of non-owner-CEO pay sensitivity is positive and even closer to statistical significance (p-value of 0.055). Interestingly, when we omit the industry dummy variables from the parsimonious (version B) regression, the coefficient of non-owner-CEO pay elasticity becomes significant at the 1% level. Finally, in our robustness test, that is based on alternative estimates of excess CEO pay, the coefficient of non-owner-CEO pay elasticity is positive and statistically significant (p-value of 0.03) – see version C in Table 3.

The economic interpretation of the support for Hypothesis 3 is not simple. Originally we suggested that higher skill professional CEOs receive higher pay (excess pay) and more performance sensitive employment contracts, and deliver, in return, higher firm valuations. However, given our rejection of Hypothesis 2, that is, given our finding of no relation between professional CEO "excess pay" and future firm valuations, we have to withdraw from the view that in Israel, during the sample period, professional CEO pay contracts were efficient. It appears that the proper interpretation of the support for Hypothesis 3 must rely on the alternative reasoning for it offered before in Section 2.2 – during the sample period closely held firm owners were reluctant to provide adequate "performance pay" to their hired professional CEOs. (Perhaps these owners relied too much on their ability to monitor the hired CEO.) The less than optimal incentives generate the cross-sectional relation between professional CEO pay performance sensitivity and firm valuation. Firms and owners that dared providing their hired CEO more generous incentives benefited from it, as presumably their CEOs exerted more efforts and increased firm valuations.

5. SUMMARY AND CONCLUSIONS

We examine the effects of CEO pay performance sensitivity and CEO "excess pay" on end of period firm valuation. Using a sample of 122 closely

held Israeli firms that did not replace their CEO during the entire 1994–2001 sample period, we find that (a) in family firms, excess pay to an owner CEO (a CEO from the controlling family) decreases firm's end of period (year 2001) Tobin's Q; and (b) in closely held firms that hire a professional non-owner CEO, the higher the pay performance sensitivity of the professional non-owner CEO, the higher is firm's end of period Q. Both these findings are novel in the literature.

The first finding above supports the view that excessive pay to a family-member CEO hurts public shareholders by reducing the market value of public holdings. There is some evidence (Holderness and Sheehan, 1988) that owner CEOs receive higher pay than professional CEOs. However, we are the first to demonstrate a direct relation between excess owner-CEO pay and firm valuation. A cautious interpretation of our findings is that some family CEOs exploit their publicly traded firm and extract private benefits in the form of excessive pay. Indeed we show that excess pay to family CEOs who are more likely to be rapacious (family CEOs with an above-median frequency of self dealing with the company) influences more negatively firm's market value. Apparently, excess pay to rapacious family CEOs is part of the private benefits they extract from their firms. This is perhaps our most important evidence.

This finding also relates to two theoretical debates. First, it supports the view that in some cases CEO's power within the firm is exploited to extract inflated pay at the expense of public shareholders. A CEO who receives excess pay is not necessarily extremely talented. She might just be boldly rapacious. The second related debate is: Does family ownership enhance or diminish firm value? Our evidence is consistent with Bennedsen, Nielsen, Perez-Gonzalez and Wolfenzon (2007) view that ceteris paribus family ownership decreases both firm performance and market value.

Our other empirical results are also instructive. For example, we document a positive relation between the pay performance sensitivity of a non-owner CEO and firm's end of period valuation. This finding may indicate that in closely held firms the owners do not provide enough incentives to their hired professional CEOs. Consequently, a natural cross-sectional distribution emerges professional CEOs who receive more performance-based pay exert more efforts and further increase firm valuation. Future studies should examine more closely the pay contract of hired professional CEOs in closely held firms and its effect on firm value.

Finally, it is interesting that we cannot find any relation between owner CEO excess pay in partnership-controlled firms (firms controlled by a coalition of two or more business partners) and end of period Q. It is

possible that the partners in a partnership-controlled firm monitor each other and monitor the partner appointed as CEO. Hence, less "excess pay" can be withdrawn by the CEO, and CEO's excess pay is less indicative of exploitation. This "lower private benefits" interpretation is consistent with previous findings and contentions (see Volpin, 2002, for example) that Q is higher in partnership firms because under the partnership coalition structure less private benefits are consumed. Alternatively, the insignificant valuation effect of excess pay to owner CEOs in partnership controlled firms may be a sample specific aberration. The ritual call for further research is reiterated.

NOTES

1. Other members of the family or coalition that controls the company together with the owner-CEO can also receive some pay from the company or be compensated in other forms. Thus, they will not object the excessive owner-CEO pay.

2. Faulkender and Yang (2007) document that in firms with weak internal governance, CEOs are most able to establish self-serving compensation benchmarks for their own pay. In weak governance firms the CEOs, together with the Board's compensation committee, construct a "compensation peer group" that is biased toward highly paid CEOs. As a result, CEO's pay is raised and becomes inflated.

3. We assume that the superior quality professional CEO does not extract the full value of her contribution to the firm through excessive pay. That is, we assume both firm and CEO share the surplus.

4. Although we focus on the 1995–2001 period, two lagged variables are used in our analysis: previous year stock return and previous year CEO pay. Thus, we have to collect data for 1994 as well.

5. We define substantial change as a change of 5% or more in control group's equity holdings.

6. After the exclusions detailed above, we had 124 firms. However, we decided to omit two more firms with outlying Q ratios of 0.17 and 19.2.

7. We employ both these interpretations. Our Hypothesis 1 relies on the second interpretation (CEO overpayment), while Hypothesis 2 relies on the first interpretation (CEO quality).

8. As a robustness test, we attempted accounting performance measures such as ROE and found their coefficients to be positive yet statistically insignificant. This result is consistent with prior empirical evidence (see Core et al., 1999) indicating that CEO pay depends primarily on stock performance.

9. Comparing versions B and C results, we observe that the coefficients of the variables involving excess pay in version C are closer to zero than their counterparts in version B. This emanates from an error in the variable problem. In general, cross-sectional regressions of average pay generate a more volatile excess pay estimate because of the omission of last year pay from the predictive regression. The more noisy (less accurate) estimate of excess pay used in version C translates directly into closer to zero coefficients.

ACKNOWLEDGMENTS

We have benefited from presentations at the 2008 European Financial Management Association Meetings at Athens. The authors thank Ono Research Institute in Finance (ORIF) and the Raymond Ackerman Family Chair in Israeli Corporate Governance for supporting this study.

REFERENCES

Ang, J. S., Lauterbach, B., & Vu, J. (2003). Efficient labor and capital markets: Evidence from CEO appointments. *Financial Management, 32*, 27–52.

Bebchuk, L. A., & Fried, J. M. (2004). *Pay without performance: The unfulfilled promise of executive compensation*. Cambridge, MA: Harvard University Press.

Bennedsen, M., Nielsen, K. M., Perez-Gonzalez, F., & Wolfenzon, D. (2007). Inside the family firm: The role of families in succession decisions and performance. *Quarterly Journal of Economics*, 647–691.

Bennedsen, M., & Wolfenzon, D. (2000). The balance of power in closely held corporations. *Journal of Financial Economics, 58*, 113–139.

Bertrand, M., & Mullainathan, S. (2001). Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics, 116*, 901–932.

Brick, I. E., Palmon, O., & Wald, K. (2006). CEO compensation, director compensation, and firm performance: Evidence of cronyism? *Journal of Corporate Finance, 12*, 403–423.

Castro, R., Clementi, G. L., & MacDonald, G. (2004). Investor protection, optimal incentives and economic growth. *Quarterly Journal of Economics, 119*, 1131–1175.

Core, J. E., Holthausen, R. W., & Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics, 51*, 371–406.

Djankov, S., LaPorta, R., Lopez-De-Silanes, F., & Shleifer, A. (2006). *The law and economics of self-dealing*. Harvard University Working Paper.

Dyck, A., & Zingales, L. (2004). Private benefits of control: An international comparison. *Journal of Finance, 59*, 537–600.

Faulkender, M. & Kang, J. (2007). *Inside the black box: The role and composition of compensation peer groups*. AFA 2008 Working Paper.

Hayes, R., & Schaefer, S. (2000). Implicit contracts and the explanatory power of top executive compensation for future performance. *RAND Journal of Economics, 31*, 273–293.

Himmelberg, P. C., Hubbard, G. R., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics, 53*, 353–384.

Holderness, C. (2009). The myth of diffuse ownership in the United States. *Review of Financial Studies, 22*, 1377–1408.

Holderness, C., & Sheehan, D. (1988). The role of majority shareholders in publicly-held corporations. *Journal of Financial Economics, 20*, 317–346.

Jensen, M. (2004). The agency costs of overvalued equity and the current state of corporate finance. *European Financial Management, 10*, 549–565.

Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics, 3*, 305–360.

Jensen, M., & Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of Political Economy*, *98*, 225–264.

LaPorta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. (1998). Law and finance. *Journal of Political Economy*, *106*, 1113–1155.

Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics*, *38*, 163–184.

Morgan, A. G., & Poulsen, A. B. (2001). Linking pay to performance-compensation proposals in the S&P 500. *Journal of Financial Economics*, *62*, 489–523.

Murphy, K. J. (1999). Executive compensation. In O. Ashenfelter & D. Card (Eds), *Handbook of Economics* (Vol. 3B, pp. 2485–2563). Amsterdam: North-Holland.

Rosen, S. (1982). Authority, control, and distribution of earnings. *Bell Journal of Economics*, *13*, 311–323.

Volpin, P. F. (2002). Governance with poor investor protection: Evidence from top executive turnover in Italy. *Journal of Financial Economics*, *64*, 61–90.