

CEO attributes, compensation, and firm value: Evidence from a structural estimation

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Education

Ph.D., Finance, University of Rochester, 2012.

M.A., Finance, University of Rochester, 2010.

University of Oklahoma, B.B.A., Finance, summa cum laude, 2003.

Academic Appointments

A. B. Freeman School of Business, Tulane University, Visiting Assistant Professor, 2017 -present.

C. T. Bauer College of Business, University of Houston, Assistant Professor, 2012 - 2017.



Publications

- CEO Attributes, Compensation, and Firm Value: Evidence from a Structural Estimation, *Journal of Financial Economics* 128 (2018), 378-401.
Formerly “CEO Ownership and Firm Value: Evidence from a Structural Estimation”
- Labor and Capital Dynamics under Financing Frictions, 2018, *Review of Finance*. (with Ryan Michaels and Toni M. Whited)

Working Papers

- Wealth Effects on CEO Compensation: Causal Evidence from the Real Estate Crash of 2006-2009, 2015
- Managerial Equity Incentives and the Investment-q Sensitivity, 2017
- Errors-in-Variables and Tests of Asset Pricing Models with Liquidity Risk, (with Anandi Banerjee) 2017
- Political Uncertainty and Firm Investment: Project-level Evidence from M&A Activity, (with Zhenhua Chen, Mehmet Cihan, and Candace E. Jens) 2018
- Corporate Cash and Political Uncertainty, (with Candace E. Jens) 2018



Abstract

- ◆ I present and estimate a dynamic model of chief executive officer (CEO) compensation and effort provision.
- ◆ I find that variation in **CEO attributes** explains the majority of variation in **compensation (equity and total)** but little of the variation in **firm value**.
- ◆ The primary drivers of **cross-sectional compensation** are **risk aversion** and **influence on the board**.
- ◆ Additionally, I estimate the magnitude of **CEO agency issues**. Removing CEO influence increases shareholder value in the typical firm by 1.74%, making CEOs risk neutral increases shareholder value by 16.12%, and removing all agency frictions increases shareholder value by 28.99%.



contents

结构方程模型（SEM）是一种建立、估计和检验因果关系模型的方法，模型中既包含有可观测的显在变量，也包含无法直接观测到的潜在变量，SEM能够对抽象的概念进行估计与检验，主要用于解决社会科学研究中的多变量问题，用于处理复杂的多变量研究数据的探究与分析。

步骤：1、模型建立 2、模型识别 3、模型估计 4、模型评价与修正

1.Introduction

2.Model

3.Data and estimation

4.The effect of CEO attributes

5.Quantifying agency costs

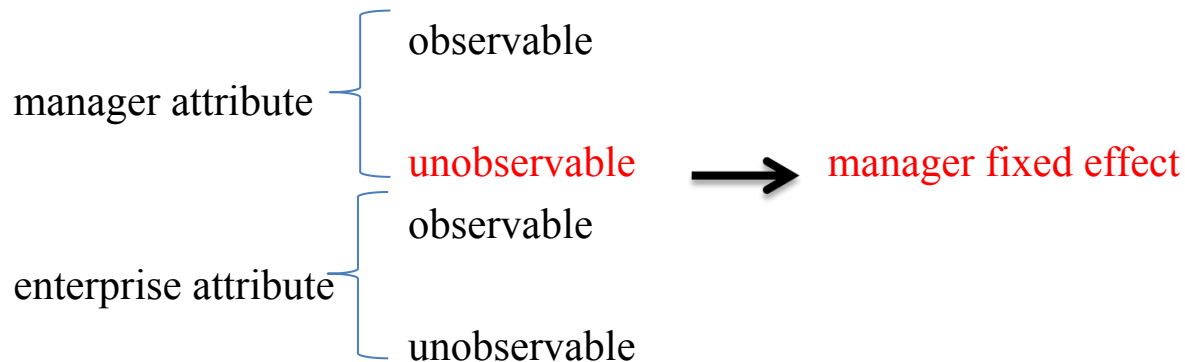
6.Conclusion



1.Introduction

Despite the considerable academic interest and research into executive compensation, there is still much I do not understand about its underlying determinants.

Graham et al. (2012)



CEO-specific attributes play a significant role in determining **the size and composition of pay**.

Estimating a fixed effect does not clarify which determinants are important for executive compensation.

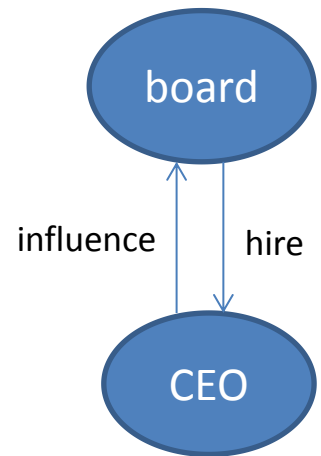


Coles and Li, (2017) call for new models that predict new determinants of executive pay.

The paper develops a model with multiple pay determinants, and then empirically estimating them as the structural parameters of a dynamic model of the compensation setting process.

CEO attributes { risk aversion γ Graham et al. (2013)
effort aversion ψ **determine his effort choice.**
outside option (reservation value) ω Becker (2006)
influence on the board λ Bebchuk and Fried (2004)

CEO's compensation { equity grant
cash } \rightarrow { shareholder wealth
forward- looking CEO utility }



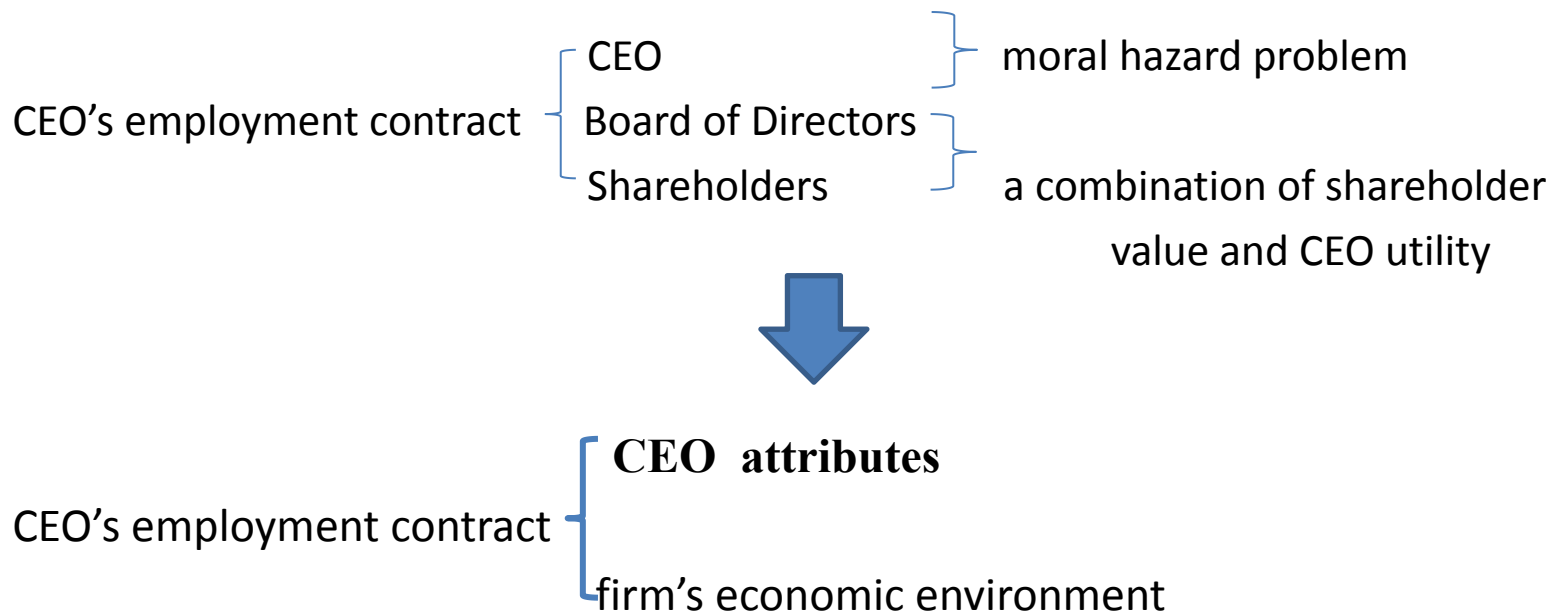
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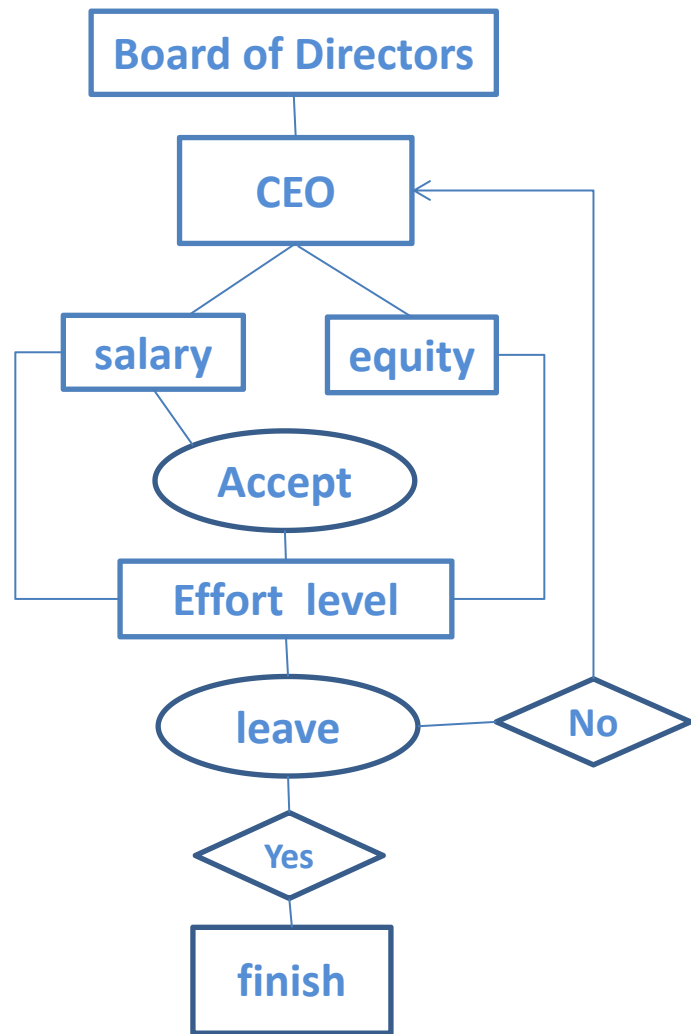
- ◆ While the estimation of risk and effort aversion, or managerial productivity, are standard in the CEO compensation structural estimation literature, **the inclusion of reservation value and influence** are novel.
- ◆ While suboptimal behavior by the board of directors has been studied, but it has not been directly studied within a contracting model.
- ◆ The paper also contributes to the broader literature using **structural estimation** to answer questions in financial economics



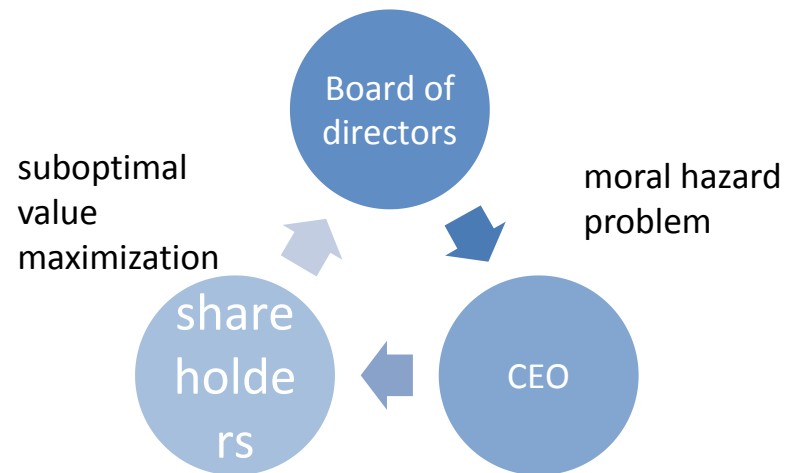
2.Model

a dynamic game with three participants: **the CEO, the firm's board of directors, and its shareholders.**





- The compensation contract
- CEO
- Firm value
- Board
- Solution



2.1 The compensation contract

Equity grant as **unvested restricted stock** , and assume the CEO does not receive dividends or trade his shares during his tenure. At retirement his equity stake fully vests .

——useful simplification

Does not include incentive-related cash bonuses

1. the bulk of a CEO's incentives comes from changes in the value of his stock ownership, not bonuses
2. many CEOs are paid bonuses for actions that are not necessarily value-maximizing.
3. a bonus or pay increase (being related to incentives) could reflect an increase in the CEO's outside option



2.2 CEO

Risk-averse :

The utility he receives in period t is:

$$u(f_t, a_t) = \frac{f_t^{1-\gamma} - 1}{1-\gamma} - k(a_t), \quad (1)$$

effort-averse :

effort cost approaches infinity as effort approaches one:

$$k(a_t) = \psi(1 - a_t)^{-1}, \quad (2)$$

CEO utility:

Before the firm hires the CEO:

$$\underline{U} = \frac{1 - \beta^{N_0}}{1 - \beta} \times \frac{\left(\frac{1}{N_0} \exp(\omega)\right)^{1-\gamma} - 1}{1 - \gamma}, \quad (3)$$

After the firm hires the CEO:

$$U^R(a_t, z_t, e_t, t) = \frac{1 - \beta^{N_t}}{1 - \beta} \times \frac{\left[\frac{1}{N_t} (\exp(\omega) + e_t V^R(a_t, z_t))\right]^{1-\gamma} - 1}{1 - \gamma}, \quad (4)$$

CEO chooses the effort level :

$$U(z_t, f_t, e_t, t) = \max_{a_t} u(f_t, a_t) + U^R(a_t, z_t, e_t, t). \quad (5)$$



2.3 Firm value

After the CEO's contract is agreed upon, the firm's current output is realized, and the firm **pays a dividend to its shareholders**, net of the CEO's salary:

$$d(z_t, f_t) = \eta z_t - f_t, \quad (6)$$

Productivity's realization each period is dependent on the CEO's effort from the previous period. Specifically:

$$\ln z_{t+1} = (1 - \rho) \left(\ln a_t - \frac{\sigma^2}{2(1 - \rho^2)} \right) + \rho \ln z_t + \ln \varepsilon_{t+1}, \quad (7)$$



Once the dividend is paid, the CEO separates from the firm with probability p_t .

- If the CEO **retires**, the firm is worth its termination value $V^R(z_t, a_t)$, which I define below.
- If he **remains** with the firm, the next period begins. Total firm value can be written

recursively as:

$$V(a_t, z_t, f_t) = d(z_t, f_t) + (1 - p_t)\beta E_t[V(a_{t+1}, z_{t+1}, f_{t+1})] + p_t\beta V^R(a_t, z_t), \quad (9)$$

- I now define shareholder value, using the recursive equation:

$$S(a_t, z_t, f_t) = d(z_t, f_t) + (1 - p_t)\beta E_t[S(a_{t+1}, z_{t+1}, f_{t+1})] + p_t(1 - e_t)\beta V^R(a_t, z_t). \quad (11)$$



The CEO quits with probability:

$$p_t = p(z_t, t) = \begin{cases} \Lambda \left(\pi_0 + \pi_z \frac{z_t - z_{t-1}}{z_{t-1}} + \pi_t t \right) & t < T \\ 1 & t = T \end{cases} \quad (10)$$

For $s \geq t R$, where $t R$ is the period in which separation occurs:

$$\ln z_{s+1} = (1 - \rho) \left(\ln a_{tR} - \frac{\sigma^2}{2(1 - \rho^2)} \right) + \rho \ln z_s + \ln \varepsilon_{s+1}, \quad (12)$$

With this definition of future firm productivity, **termination value** is:

$$V^R(a_t, z_t) = \eta \times \sum_{s=tR+1}^{\infty} \beta^{s-tR} E_{tR}[z_s]. \quad (13)$$



2.4 Board

Board maximize a weighted average of **shareholder value and future CEO utility** (ignoring the CEO's utility from current cash compensation). At the beginning of the **final period of the CEO's tenure**, the board solves:

$$\begin{aligned} & W(a_{T-1}, z_{T-1}, e_{T-1}, T) \\ &= \max_{f_T, e_T} (1 - \lambda) E_{T-1} [d(a_T, z_T, f_T) + \beta(1 - e_T) V^R(a_T, z_T)] \\ & \quad + \lambda E_{T-1} [U^R(a_T, z_T, e_T, T) - k(a_T)], \end{aligned} \quad (14)$$

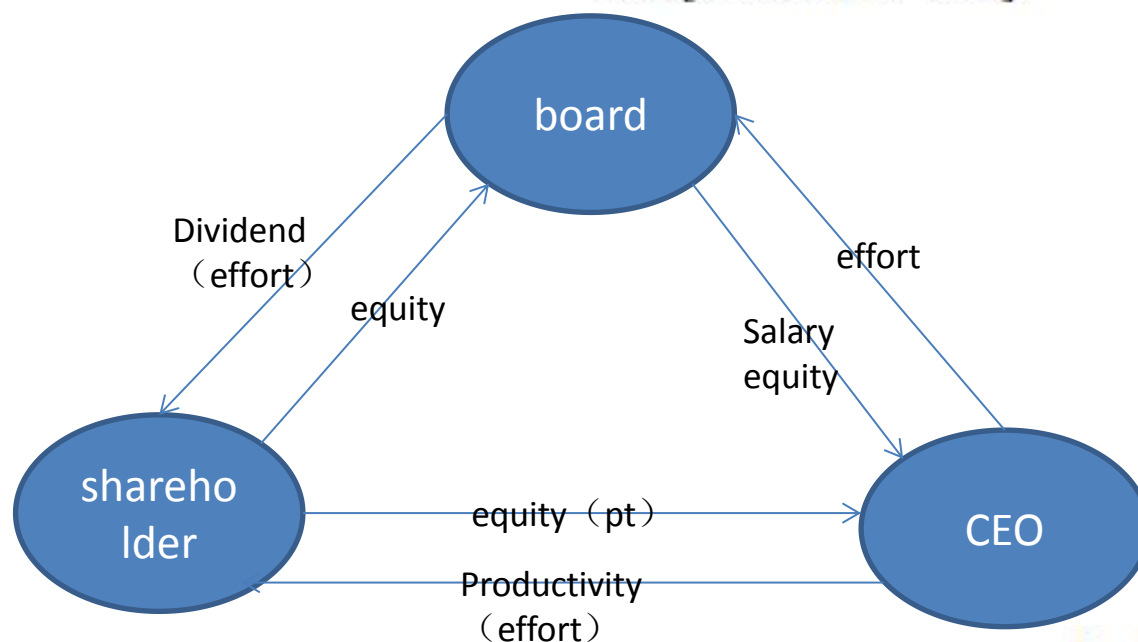
in period t , the board solves the recursive problem :

$$\begin{aligned} & W(a_{t-1}, z_{t-1}, e_{t-1}, t) \\ &= \max_{f_t, e_t} (1 - \lambda) E_{t-1} [d(z_t, f_t) + \beta((1 - p_t) W(a_t, z_t, e_t, t) \\ & \quad + p_t (1 - e_t) V^R(a_t, z_t))] \\ & \quad + \lambda E_{t-1} [U^R(a_t, z_t, e_t, t) - k(a_t)], \end{aligned} \quad (15)$$



2.5 Solution

$$\begin{aligned}
 W(a_{t-1}, z_{t-1}, e_{t-1}, t) &= \max_{f_t, e_t} (1 - \lambda) E_{t-1} [d(z_t, f_t) + \beta((1 - p_t)W(a_t, z_t, e_t) \\
 &\quad + p_t(1 - e_t)V^R(a_t, z_t))] \\
 &\quad + \lambda E_{t-1} [U^R(a_t, z_t, e_t, t) - k(a_t)], \quad (15)
 \end{aligned}$$



$$\begin{aligned}
 S(a_t, z_t, f_t) &= d(z_t, f_t) + (1 - p_t)\beta E_t [S(a_{t+1}, z_{t+1}, f_{t+1})] \\
 &\quad + p_t(1 - e_t)\beta V^R(a_t, z_t). \quad (11)
 \end{aligned}$$

$$\begin{aligned}
 U^R(a_t, z_t, e_t, t) &= \frac{1 - \beta^{N_t}}{1 - \beta} \\
 &\quad \times \frac{[\frac{1}{N_t}(\exp(\omega) + e_t V^R(a_t, z_t))]^{1-\gamma} - 1}{1 - \gamma}, \\
 k(a_t) &= \psi(1 - a_t)^{-1},
 \end{aligned}$$



3.Data and estimation

3.1Data

Sample : Publicly traded U.S. firms over the 1992 to 2014 period

Data : CEO ownership, compensation, tenure, and insider board representation

financial statement data 、 operating income、 book assets and market value. ——Execucomp
——Compustat

return 、 stock volatility ——CRSP

large blockholders—IRRC

institutional ownership—Thomson Financial

Remove data :

missing values, negative or zero assets or market values, and negative equity ownership .

Observations from a CEO's first year in office .

founder CEOs

the top 0.5% of the CEO percentage delta distribution

21,225 firm-CEO-year observations for 2288 firms



Table1--Descriptive statistics

<i>Panel A: firm</i>	Mean	25%	50%	75%	S. D.	N
Operating income (\$B)	1.035	0.071	0.221	0.730	3.344	21,225
Assets (\$B)	10.268	0.720	2.084	6.883	53.127	21,225
Market value (\$B)	9.664	0.712	1.962	6.260	30.763	21,225
Market-to-book	1.348	0.563	0.974	1.658	1.287	21,225
Volatility	0.326	0.194	0.275	0.403	0.185	21,225
<i>Panel B: CEO</i>	Mean	25%	50%	75%	S. D.	N
Total compensation (\$M)	5.988	1.721	3.524	6.988	11.382	21,225
Total compensation (%)	0.309	0.075	0.166	0.349	0.446	21,225
Cash compensation (\$M)	2.136	0.803	1.397	2.536	2.883	21,225
Cash compensation (%)	0.142	0.029	0.068	0.150	0.231	21,225
Delta (\$M)	3.358	0.334	0.729	1.640	34.685	21,225
Delta (%)	2.688	0.437	1.066	2.382	5.308	21,225
<i>Panel C: governance</i>	Mean	25%	50%	75%	S. D.	N
Insider board representation (%)	26.019	12.500	22.222	33.333	15.525	12,904
Institutional ownership (%)	66.086	55.355	68.086	79.129	17.724	4256
Blockholder ownership (%)	16.122	5.600	14.100	24.730	13.825	1558



3.2 Solve the model

model's parameters:

β is set to 0.928, which corresponds to the average yearly return in the sample.

δ is set to 0.02, which is the mean yearly equity decrease, from sales and option expiration, in the data.

The probability a CEO separates from his firm in a given year is:

$$p_t = \begin{cases} \Lambda \left(1.664 + 0.496 \times \frac{z_t - z_{t-1}}{z_{t-1}} - 3.810 \times 10^{-3} \times t \right) & t < T \\ 1 & t = T \end{cases} \quad (23)$$

With these secondary parameters set, there are seven parameters to estimate:

$\rho, \sigma, \eta, \gamma, \psi, \omega,$ and λ .



3.3 Identification

Parameter moments:

Split the parameter vector into two groups:

- ✓ **Economic environment parameters** $\{\rho, \sigma, \eta\}$ — obvious empirical proxy
- ✓ CEO attributes $\{\gamma, \psi, \omega, \lambda\}$

cash flow growth for firm i in year t

$$g_{it} = \frac{CF_{it} - CF_{i,t-1}}{0.5 \times (CF_{it} + CF_{i,t-1})}$$

estimate the cash flow autocorrelation

$$2g_{it} + g_{i,t-1} = \phi g_{i,t-1} + \zeta_{i,t+1}$$

ϕ — serial correlation of within-firm cash flows — ρ

g — the within-firm variance — σ

firm scale — mean log market value — η



✓ **CEO attributes $\{\gamma, \psi, \omega, \lambda\}$.**——no obvious empirical proxies

λ ——CEO equity exposure (equity shares + the delta of his stock options) ——**the mean of the logarithm of one plus CEO delta**

ω ——**the mean of the logarithm of one plus total cash compensation** (salary plus bonuses)

A more difficult identification problem is separately identifying risk aversion (γ) from effort aversion (ψ).

- **the mean ratio of cash to total annual compensation(salary + new equity grants)**
- **within-firm sensitivity of CEO delta and firm value.**

extra moments:

within-firm sensitivity of cash compensation to firm value

within-firm serial correlation of CEO delta

within-firm serial correlation of cash compensation.



3.4. Estimation results: full sample

Table 2

Panel A: moments

	Actual moments	Simulated moments	T-statistics
λ Mean log delta	3.228	3.235	0.366
ω Mean log salary	1.086	1.132	6.565
γ & ψ Mean salary to total compensation ratio	47.301	47.597	2.715
η Mean log firm value	7.690	7.792	3.674
γ & ψ Sensitivity of delta to firm value	0.759	0.681	-8.193
Sensitivity of salary to firm value	0.190	0.216	18.801
Serial correlation of log delta	0.859	0.867	1.204
Serial correlation of log salary	0.424	0.595	15.540
ρ Serial correlation of cash flow	0.853	0.789	-4.930
σ Variance of cash flow growth	0.211	0.202	-2.908

Panel B: parameters

γ	ψ	ω	λ	ρ	σ	η
2.046	0.303	2.854	0.376	0.843	0.499	5.689
(0.012)	(0.005)	(0.007)	(0.014)	(0.004)	(0.008)	(0.027)



该表给出了参数对表2中报告的估计时刻的标准化灵敏度，标准化灵敏度范围从-1到+1，幅度越大表示灵敏度越高，空白条目表示敏感度的绝对值大小小于0.250。

Table 3

Local sensitivity of parameters to moments.

This table presents the (Gentzkow and Shapiro, 2015) standardized sensitivity of parameters to moments for the estimation reported in Table 2. Standardized sensitivity ranges from -1 to +1, with larger magnitudes indicating higher sensitivity. Blank entries indicate the magnitude of the sensitivity is less than 0.250. The parameters are CEO risk aversion γ , CEO effort aversion ψ , CEO reservation value ω , CEO influence with the board λ , the autocorrelation of the cash flow law of motion ρ , the standard deviation of cash flow shocks σ , and cash flow scale η .

	γ	ψ	ω	λ	ρ	σ	η
λ Mean log delta	-0.654		0.658	0.255			
ω Mean log salary		0.383	0.741		-0.273		0.431
γ & ψ Mean salary to total compensation ratio	0.334	-0.354		-0.321			0.752
η Mean log firm value							0.968
γ & ψ Sensitivity of delta to firm value	-0.556	-0.525			0.421		
Sensitivity of salary to firm value	-0.451	-0.385			0.550		0.273
Serial correlation of log delta	0.510	0.580	-0.358				
Serial correlation of log salary			-0.470				-0.544
ρ Serial correlation of cash flow					0.992		
σ Variance of cash flow growth						0.986	



3.5. Estimation results: cross section

Table 4 Distribution of structural parameters in the cross section.

Panel A: parameter statistics

	Mean	Min	25%	50%	75%	Max	S. D.
γ	1.948	1.148	1.581	1.967	2.205	3.222	0.459
ψ	0.417	0.011	0.263	0.362	0.510	1.260	0.265
ω	2.771	-0.134	2.549	2.790	3.160	4.219	0.730
λ	0.280	-0.050	0.109	0.218	0.369	0.773	0.218
ρ	0.868	0.566	0.821	0.884	0.927	0.987	0.082
σ	0.414	0.064	0.316	0.410	0.511	0.735	0.138
η	5.655	3.399	5.214	5.495	6.355	9.352	1.226

Panel B: parameter correlations

	γ	ψ	ω	λ	ρ	σ	η
γ		0.059	0.325**	0.512***	0.522***	0.504***	-0.557***
ψ	-0.483***		-0.753***	-0.449**	0.377***	0.157	0.592***
ω	0.474***	-0.747***		-0.293**	0.125	-0.100	0.455***
λ	0.133	-0.181	0.274**		-0.210	-0.255*	0.794***
ρ	0.041	0.411***	-0.046	0.095		-0.682***	0.181
σ	0.233*	-0.107	-0.115	-0.283**	-0.597***		0.108
η	-0.442***	0.497***	-0.145	0.545***	0.382***	-0.393***	

$\gamma \& \psi \times$
 $\omega \& \lambda -$
 $\psi \& \omega, \lambda -$
 $\gamma \& \omega, \lambda +$



Table 5

Systematic distribution of CEO attributes.

This table reports the results of regressing estimates for the four CEO attributes for the cross section of 54 subsamples, described in Table 4 on the median log market value, volatility, and market-to-book of those subsamples. The CEO attributes are: risk aversion γ , effort aversion ψ , reservation value ω and influence with the board λ . Standard errors are in parentheses. Stars by an estimate signal statistical significance: (***) for significance at the 1% level, (**) for 5% level, and (*) for 10% level.

	γ	ψ	ω	λ
Median log market value	-0.545*** (0.122)	0.401*** (0.118)	-0.188 (0.127)	0.588*** (0.107)
Median volatility	-0.044 (0.122)	0.038 (0.118)	-0.010 (0.127)	-0.005 (0.107)
Median market-to-book	0.050 (0.121)	-0.478*** (0.117)	0.461*** (0.127)	0.263** (0.107)
R^2	0.286	0.337	0.226	0.451



4. The effect of CEO attributes

4.1 Comparative statics

Table 6

S. D.		Delta	Salary	Pay	Firm value	Shareholder value
0.459	γ	-32.50	-2.15	-15.97	-2.03	-1.79
0.265	ψ	34.87	65.26	124.98	-13.84	-14.81
0.730	ω	56.42	41.73	47.59	-7.69	-8.09
0.218	λ	39.16	-1.33	24.08	-1.41	-1.80
0.082	ρ	2.46	-9.75	-4.12	-12.44	-12.57
0.138	σ	-0.90	0.89	1.39	-0.12	-0.15
1.226	η	-18.56	35.40	-10.44	247.16	253.35

γ	ψ	ω	λ	ρ	σ	η
2.046 (0.012)	0.303 (0.005)	2.854 (0.007)	0.376 (0.014)	0.843 (0.004)	0.499 (0.008)	5.689 (0.027)

$$2.046 \pm 0.456/2$$

Compensation---CEO attributes

Firm/shareholder value---economic environment



4.2 Removing heterogeneity

Table 7

	<i>LogDelta</i>	<i>LogSalary</i>	<i>LogPay</i>	<i>LogFirmValue</i>	<i>LogShareholderValue</i>
<i>Panel A: CEO versus economic heterogeneity</i>					
No CEO heterogeneity	0.282	0.587	0.389	1.056	1.086
No economic heterogeneity	1.030	0.768	1.248	0.113	0.121
<i>Panel B: heterogeneity in all CEO attributes excepting</i>					
γ	1.191	1.129	1.039	0.992	0.994
ψ	1.021	0.758	0.821	1.076	1.082
ω	1.161	1.390	1.411	1.037	1.038
λ	0.664	0.947	0.986	1.018	1.035
<i>Panel C: heterogeneity in no CEO attributes excepting</i>					
γ	0.783	0.512	0.570	1.073	1.100
ψ	0.458	1.209	1.038	0.978	0.998
ω	0.644	0.696	0.653	1.080	1.110
λ	0.640	0.643	0.582	1.043	1.049

$\times \lambda \rightarrow \lambda \& \eta +$ $\times \gamma \rightarrow \lambda \& \omega +$ $\times \gamma \rightarrow \gamma \& \eta -$

Compensation --- CEO attributes --- γ 、 λ

Firm/shareholder value --- economic environment



4.3 Cross-sectional regressions

Table 8

	<i>LogDelta</i>	<i>LogSalary</i>	<i>LogPay</i>	<i>LogFirmValue</i>	<i>LogShareholderValue</i>
γ	-0.356** (0.062)	-0.176 (0.155)	-0.238** (0.108)	-0.186** (0.073)	-0.113** (0.029)
ψ	-0.239** (0.069)	0.408** (0.242)	0.223 (0.134)	-0.032 (0.151)	-0.097** (0.055)
ω	0.294** (0.065)	0.136 (0.163)	0.140 (0.113)	-0.103 (0.085)	-0.093** (0.032)
λ	0.295** (0.064)	0.403*** (0.146)	0.361*** (0.097)	0.270** (0.069)	0.118** (0.029)
ρ	-0.076 (0.053)	-0.224 (0.197)	-0.119 (0.120)	-0.230** (0.102)	-0.126** (0.035)
σ	0.007 (0.042)	-0.059 (0.138)	0.052 (0.085)	-0.132** (0.075)	-0.034 (0.027)
η	0.671*** (0.082)	0.362* (0.242)	0.561*** (0.142)	0.712*** (0.146)	0.928*** (0.055)
R^2	0.962	0.705	0.864	0.938	0.990



- **CEO attributes** are the drivers of most of the heterogeneity in pay and equity incentives in the cross section of CEOs. The primary drivers of cross-sectional compensation are **risk aversion** and **influence on the board**.
- CEO attributes also contribute to the heterogeneity in firm value, parameters for the **economic environment** explain a much larger portion of the variation.



5. Quantifying agency costs

The model includes **three agency frictions: risk aversion, effort aversion, and CEO influence on pay.**

This section quantifies the impact these frictions have on shareholder value and executive pay by removing each friction for the full sample, the cross section, and samples formed using governance proxies.

5.1 *Full sample and cross section*

- remove CEO influence
- remove risk aversion and CEO influence
- remove all agency frictions

5.2 *Governance*



5.1. Full sample and cross section

Table 9---Removing agency frictions.

	Full sample	Mean	Min	25%	50%	75%	Max	S.D.
<i>Panel A: removing influence</i>								
Firm value	1.28	1.11	-0.77	0.05	0.52	1.43	7.44	1.63
Shareholder value	1.74	1.59	-0.83	0.21	0.87	1.97	8.79	1.98
Delta	-37.90	-30.71	-71.44	-36.50	-30.26	-16.50	29.43	32.98
Salary	12.56	7.44	-22.23	0.71	6.13	10.51	46.24	12.17
Pay	-16.85	-14.94	-53.02	-16.59	-13.40	-7.37	9.74	16.61
<i>Panel B: removing influence and risk aversion</i>								
Firm value	19.37	21.86	4.33	14.83	20.42	25.34	100.76	12.47
Shareholder value	16.12	18.51	-4.55	11.51	16.80	22.09	97.67	13.41
Delta	426.70	361.89	0.99	236.42	353.82	525.50	2364.29	80.90
Salary	-54.86	-51.53	-71.61	-60.46	-52.52	-42.01	14.37	38.32
Pay	35.08	34.71	-36.38	15.88	34.57	53.01	276.78	36.31
<i>Panel C: removing all agency costs</i>								
Firm value	27.71	33.64	9.57	4.32	29.09	37.40	138.81	14.52
Shareholder value	28.99	35.78	12.32	26.42	30.41	39.30	145.87	14.88

Removing agency frictions increase shareholder value



5.2. Governance

Table 10---Parameter estimation

	γ	ψ	ω	λ	ρ	σ	η
<i>Panel A: insider representation on board of directors</i>							
Low insider representation	1.553 (0.003)	0.489 (0.010)	2.392 (0.019)	0.305 (0.042)	0.859 (0.010)	0.376 (0.018)	6.294 (0.009)
High insider representation	2.247 (0.030)	0.213 (0.008)	3.266 (0.012)	0.551 (0.035)	0.810 (0.014)	0.507 (0.017)	5.472 (0.060)
<i>Panel B: institutional ownership</i>							
Low institutional ownership	2.007 (0.007)	4.413 (0.013)	2.190 (0.003)	0.403 (0.015)	0.939 (0.005)	0.456 (0.012)	7.168 (0.006)
High institutional ownership	1.415 (0.038)	0.335 (0.003)	2.682 (0.014)	0.210 (0.029)	0.819 (0.015)	0.446 (0.017)	5.694 (0.059)
<i>Panel C: large blockholder ownership</i>							
Low large blockholder ownership	2.669 (0.010)	1.595 (0.015)	3.003 (0.007)	0.447 (0.009)	0.863 (0.012)	0.393 (0.003)	7.120 (0.007)
High large blockholder ownership	1.449 (0.013)	0.464 (0.020)	2.211 (0.061)	0.123 (0.054)	0.850 (0.006)	0.377 (0.031)	5.360 (0.097)

these costs are lower in firms thought to have better corporate governance



Table 11---Removing agency frictions: governance

	Remove influence	Remove influence & risk aversion	Remove all
<i>Panel A: insider representation on board of directors</i>			
Low	1.13	16.43	28.57
High	1.59	18.90	31.10
<i>Panel B: institutional ownership</i>			
Low	32.62	216.37	289.96
High	0.43	11.89	24.40
<i>Panel C: large blockholder ownership</i>			
Low	-9.09	96.06	119.80
High	0.71	10.68	26.88

Removing agency frictions increase shareholder value.



5.3. Discussion

➤ 5.3.1. *The persistence of influence*

The paper identifies and quantifies this influence, it **does not explain its source or why it continues to exist.**

- λ is negatively correlated with both risk and effort aversion, suggesting more able CEOs also wield greater influence over their compensation .
- Firms with lower **insider board representation** have CEOs with less influence. In their model, corporate governance is endogenously persistent, so a new CEO faces a similar governance environment to the previous CEO.
- Firms with **more institutional ownership** have CEOs with less influence, the costs associated with removing CEO influence are un-known, it could even be optimal to allow some influence to persist.



➤ 5.3.2. Risk aversion and stock options

- High levels of risk aversion decrease shareholder value. One tool firms have available to **counteract risk aversion is the use of options** to make managerial contracts more convex.
- **option effectiveness increases as risk aversion decreases**, the relation is weak. This result suggests firms do not use stock options to counteract CEO risk aversion.



6. Conclusion

- In this paper, I seek to better understand CEO compensation by identifying its underlying determinants and examining their effects on executive pay, equity incentives, and shareholder value.
- My primary interest lies in **CEO- specific attributes**: risk aversion, effort aversion, bargaining power, and influence on the board. I find that all four of these attributes significantly affect pay, incentives, and value.
- I **quantify the costs of agency frictions** (risk aversion, effort aversion, and influence) to shareholders, and provide evidence that **these costs are lower in firms thought to have better corporate governance**, although better governance does not appear to remove the costs completely.
- Additionally, I show that **CEO attributes** are the drivers of most of the heterogeneity in pay and equity incentives in the cross section of CEOs. While CEO attributes also contribute to the heterogeneity in firm value, parameters for the **economic environment** explain a much larger portion of the variation.



谢谢聆听！



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