

Executive Compensation: Facts

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Three Views of Executive Compensation

- Jensen and Murphy - 1990
 - CEO's Are Essentially Paid Like Bureaucrats
- AFL-CIO
 - Chief Executive Officers average 364 times the wage of the average U.S. worker
- Barney Frank
 - Compensation of Executives is a root cause of the financial crisis of 2007-2009

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We are interested in

- Documenting
 - Correlation between compensation and firm size
 - Behavior of compensation over time
 - Split of compensation between current and deferred compensation
 - Sensitivity of compensation with respect to innovations in shareholder wealth
- Documenting how sensitivity varies with
 - Firm size
 - Volatility of shareholders' dollar return

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Main Findings

1. Compensation is highly skewed to the left
2. Each year, a sizeable fraction of CEOs lose money
3. Security awards are used more extensively at large companies
4. The portion of CEO wealth tied to the firm has increased dramatically in recent times
5. Most of the increase in CEO wealth is due to growth in the value of stock claims
6. Compensation responds strongly to innovations in shareholder wealth – However, pay–performance sensitivity of professional CEOs is lower than previously thought

Notions of Compensation

- 1. Classical Definition** - Salary, Grant Date Value of Awards
- 2. Current Compensation** - That which can be converted into consumption in the current year
- 3. Net Compensation** - Assumes one can hedge by buying the market portfolio

What Theory Tells Us

- Risk-neutral shareholders make a take-it-or-leave-it offer to a CEO with outside value \underline{v} .
- Cash flows are given by a random variable z_t , with distribution $F(z_t|a_t)$. where $a_t \geq 0$ indicates the effort.
- CEO's utility function $u(w_t, a_t)$
- The contract is a sequence of wages $\{w_t(h^t)\}_{t=1}^T$, and an effort recommendations $\{a_t(h^{t-1})\}_{t=1}^T$.

What Theory Tells Us

- The contract offered by the shareholders will solve the following optimization problem:

$$\max_{\{w_t(h^t), a_t^*(h^{t-1})\}_{t=1}^T} \sum_{t=0}^T \beta^t \int [z_t - w_t(h^t)] d\mathcal{F}(h^t | \mathbf{a}_t^*(h^{t-1})),$$

subject to

$$\sum_{t=0}^T \beta^t \int u[w_t(h^t), a^*(h^{t-1})] d\mathcal{F}(h^t | \mathbf{a}_t^*(h^{t-1})) \geq$$

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What Theory Tells Us

- The shareholders' problem becomes that of choosing a level of effort, a contingent wage schedule $w_t(z_t)$, and continuation values $v_{t+1}(z_t)$. That solves the following problem:

$$V_t(v_t) = \max_{w_t(z_t), a_t^*, v_{t+1}(z_t)} \int [z_t - w_t(z_t) + \beta^t V_{t+1}(v_{t+1}(z_t))] dF(z_t | a_t^*)$$

subject to

$$\int \{u[w_t(z_t), a_t^*] + \beta^t v_{t+1}(z_t)\} dF(z_t | a_t^*) \geq$$

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and

$$v_t = \int \{u[w_t(z_t), a_t^*] + \beta^t v_{t+1}(z_t)\} dF(z_t | a_t^*).$$

Description of the Data

- All compensation data is from EXECUCOMP, by Standard& Poor's
- Unbalanced panel with information on up to 9 executives for a total of 2,873 corporations, from 1992 to date
- Restricting attention to CEOs 1992–2006 and cleaning leaves us with 4,892 executives, belonging to 2,678 firms, for a total of 25,171 CEO–year observations.

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CEO wealth

- Roughly speaking: Expected Lifetime Compensation
- Ideally measured as the sum of:
 - Present value of future salaries, bonuses, dividends
 - Market Value of Stock Holdings plus value of future contingent stock awards
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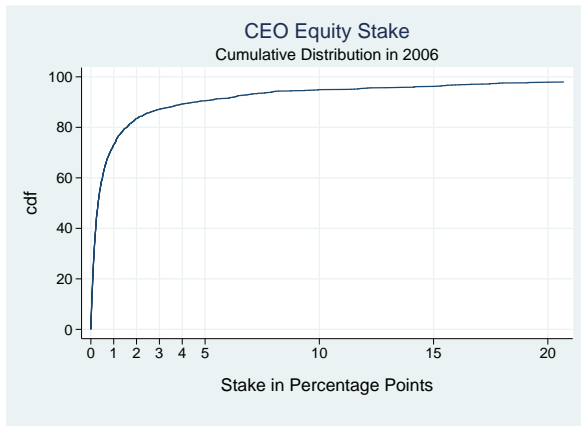
Total Yearly Compensation

- Roughly speaking: the year-on-year change in CEO wealth
- Current Compensation
 - salary
 - bonus
 - dividends
 - net revenues from trade in stock
- Deferred Compensation
 - change in the value of stock holdings
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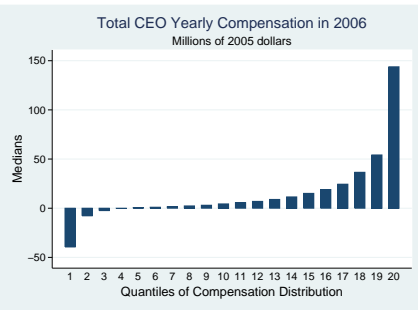
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Separation of Ownership and Control



The Size of Compensation

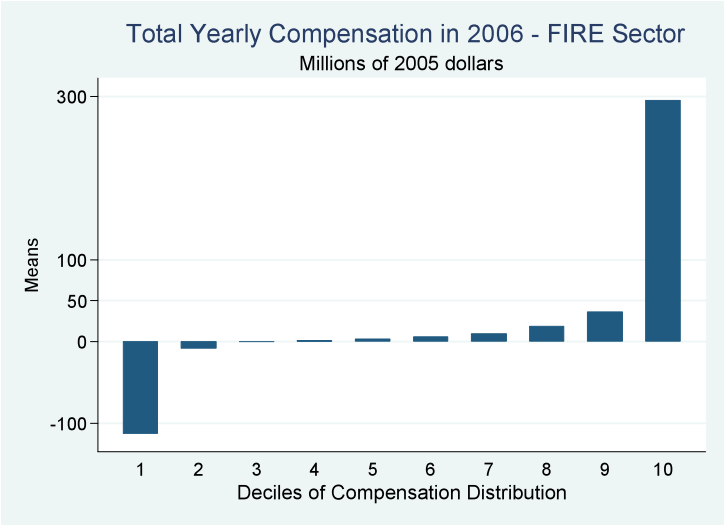
Skewness of Compensation



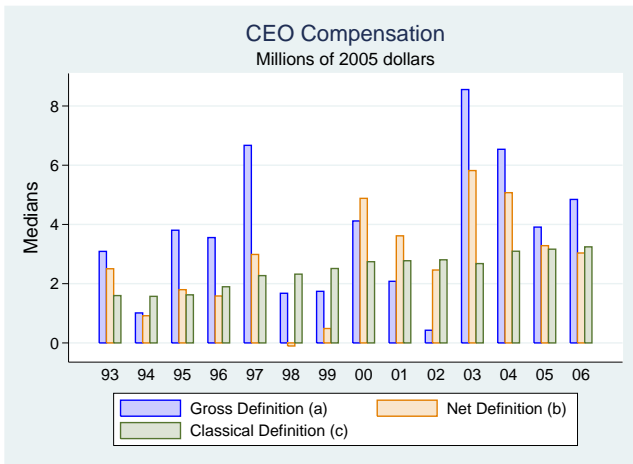
Skewness of Compensation

Year	Mean	Median	Means by Decile – Millions of 2005 dollars									
			1	2	3	4	5	6	7	8	9	10
1993	23.51	3.46	-44.62	0.18	1.01	1.70	2.74	4.30	6.92	11.80	25.19	224.99
1994	8.69	1.10	-42.51	-4.25	-0.47	0.40	0.85	1.51	2.54	4.56	10.02	113.32
1995	38.32	4.62	-13.29	0.11	1.03	2.03	3.58	5.72	9.29	15.39	26.93	330.92
1996	27.47	4.11	-23.20	-0.31	0.83	1.68	3.10	5.36	8.96	14.52	28.83	233.61
1997	62.79	7.34	-43.93	0.68	1.86	3.72	5.97	9.03	14.48	23.93	44.74	564.80
1998	65.07	1.99	-54.07	-6.69	-1.81	0.17	1.30	2.97	6.98	15.18	38.90	646.74
1999	113.09	2.17	-146.99	-7.09	-1.82	0.25	1.36	3.10	7.21	15.60	39.05	1,218.07
2000	-6.75	4.94	-577.65	-7.60	-0.24	1.49	3.45	6.76	12.75	24.45	57.99	411.07
2001	4.94	2.84	-321.69	-9.46	-1.30	0.88	2.06	4.08	7.48	12.89	24.56	327.09
2002	-20.54	0.72	-349.90	-15.30	-5.04	-1.21	0.28	1.38	2.95	5.41	11.09	143.61
2003	36.56	9.39	-31.50	1.56	3.29	5.25	7.82	11.39	17.13	26.43	47.69	275.47
2004	29.97	7.58	-46.80	-0.53	1.57	3.37	6.09	9.09	13.23	19.87	35.15	256.92
2005	22.165	4.54	-48.57	-2.77	0.38	1.57	3.49	5.88	9.84	16.85	30.41	203.71
2006	51.30	6.01	-563.68	-0.82	1.03	2.42	4.63	7.75	12.87	20.38	36.83	479.12

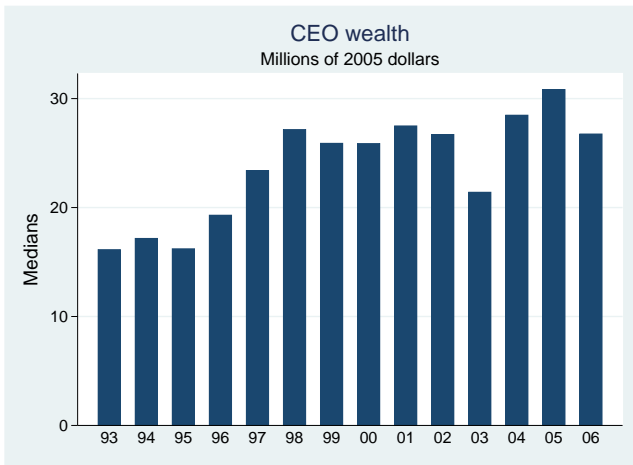
Skewness in the Finance Sector



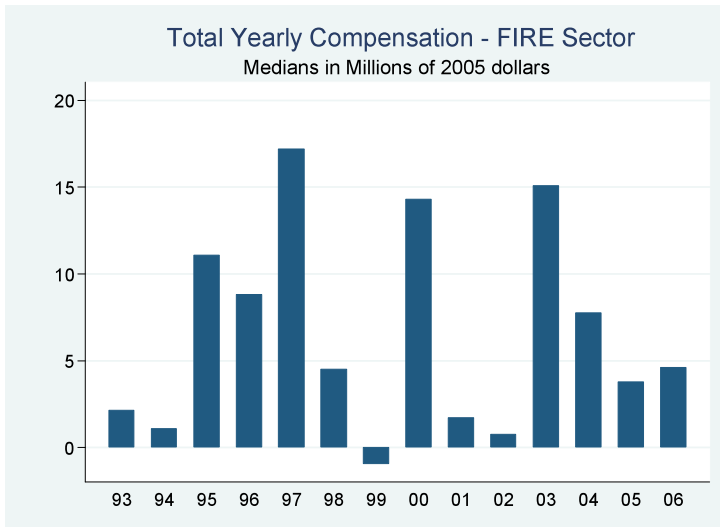
Compensation Over Time



Compensation Over Time



Compensation Over Time – Finance Sector

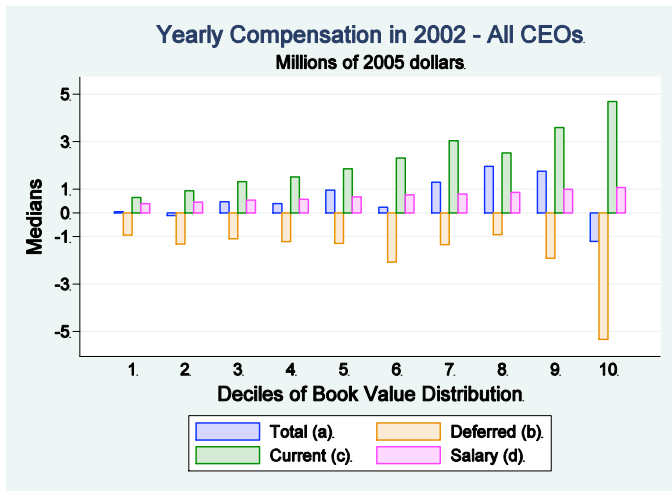


Compensation and Firm Size

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Compensation and Firm Size



Growth in Firm Size and Compensation

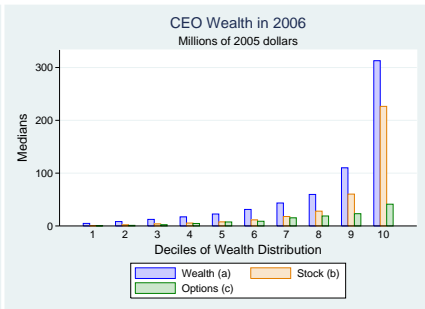
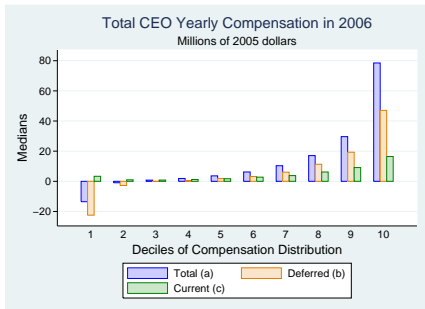
Firm Size and CEO Wealth, 1993–2006

Medians in Millions of 2005 US Dollars

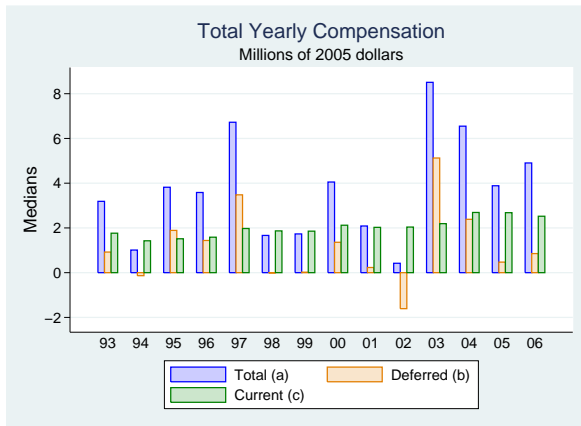


The Composition of Compensation

Composition of Compensation



Composition of Compensation Over Time

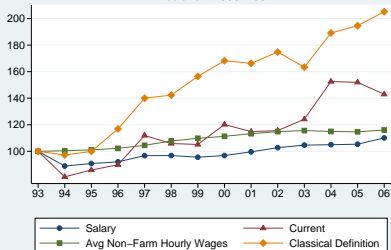


Composition Across Sectors

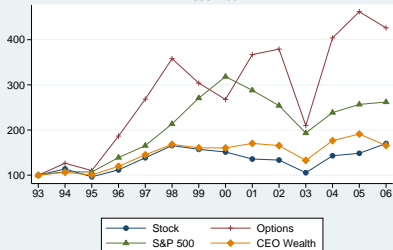


Growth in Compensation Over Time

Growth in Compensation – Selected Components
Medians – 1993=100



Growth in Median CEO Wealth – Selected Components
1993=100



Pay–Performance Sensitivity

Sensitivity of Compensation to Shareholder Wealth

- Follow Aggarwal & Samwick (JPE '99) running **median regressions** of different measures of compensation on
 - year-to-year changes in market capitalization
 - same measure interacted with a measure of volatility of dollar shareholder returns
 - year dummies

$$w_{ijt} = \gamma_0 + \gamma_1 \Delta MKT_CAP_{jt} + \gamma_2 \Delta MKT_CAP_{jt} \times F(\sigma_{jt}^2) + \gamma_3 F(\sigma_{jt}^2) + \lambda_t + \varepsilon_{it}$$

- Aggarwal & Samwick (JPE '99)'s measure of sensitivity:
 $\gamma_1 + \gamma_2 \times F(\sigma_{jt})$

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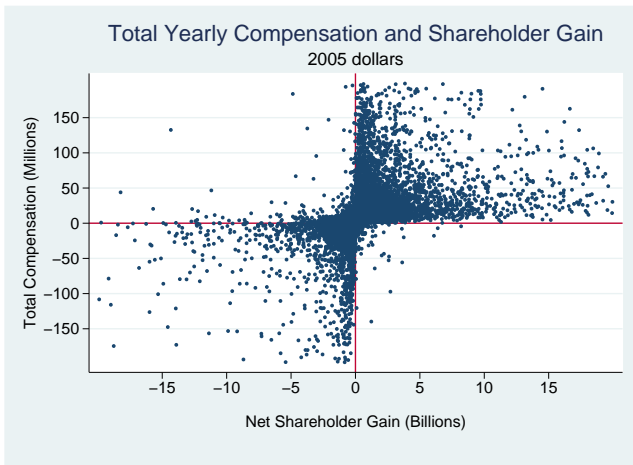
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Pay-Performance Sensitivity – All CEOs

Dependent Variables:	Total	Current	Deferred
Shareholder_Gain	27.079 (0.097)	1.415 (0.041)	21.605 (0.061)
Sh_Gain \times Variance_distrib	-24.748 (0.1)	-1.28 (0.042)	-19.529 (0.062)
Variance_distrib	4261.109 (182.0)	3693.64 (77.382)	246.624 (114.7)
Number of observations	15,749	16,064	15,749
Pseudo R^2	0.081	0.021	0.063

Note: Standard errors in parenthesis.

Pay-Performance Sensitivity – All CEOs



Pay-Performance Sensitivity – Professional CEOs only

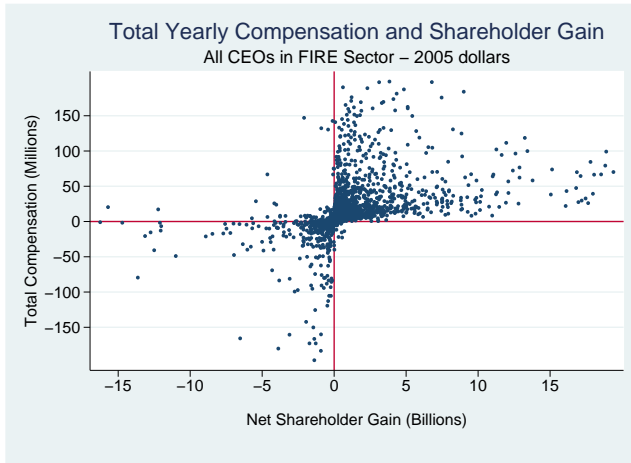
- Effect on compensation of a \$1,000 change in shareholder wealth:

	Total	Current	Deferred
Lowest Variance	17.733	1.149	14.470
Median Variance	9.836	0.636	8.036
Largest Variance	1.939	0.124	1.603

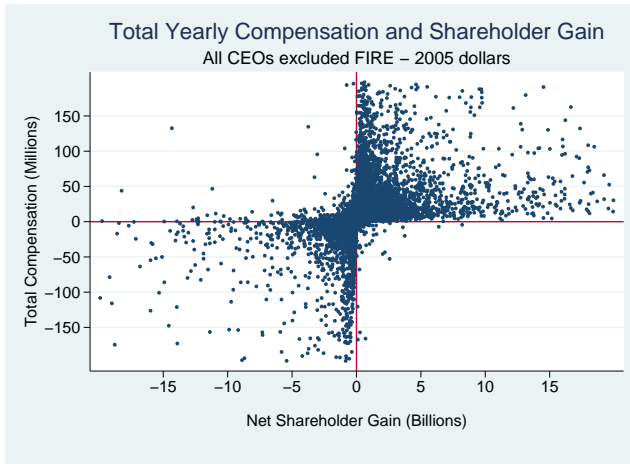
Pay-Performance Sensitivity – All CEOs

Dependent Variable :	Total	
Shareholder_Gain	27.079 (0.097)	26.761 (0.095)
Sh_Gain \times Variance_distrib	-24.748 (0.1)	-24.232 (0.097)
Variance_distrib	4261.109 (182.0)	4292.338 (187.388)
Sh_Gain \times Asset(t-1)	-	-0.0015 (0.00003)
Asset(t-1)	-	0.012 (0.01)
Number of observations	15,749	14,914
Pseudo R^2	0.081	0.082

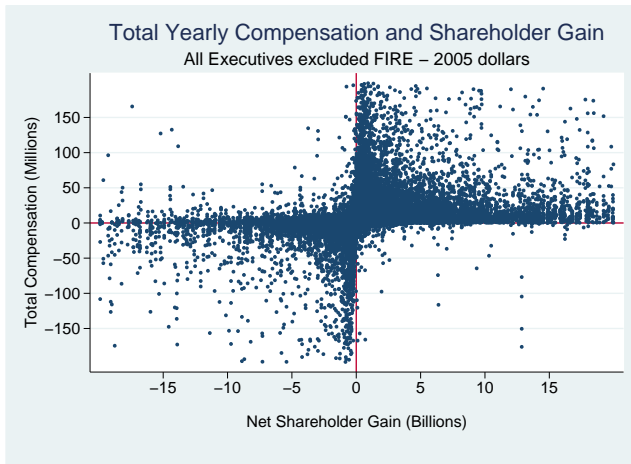
Pay-Performance Sensitivity – All CEOs FIRE



Pay-Performance Sensitivity – All CEOs Non FIRE



Pay-Performance Sensitivity – All Execs Non FIRE



Pay-Performance Sensitivity – All Execs FIRE

