

Yesterday's Heroes: Compensation and Creative Risk Taking

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Was it the Bonuses?

Tim Geithner on executive compensation (June 6 2009
Congressional testimony on the Treasury budget):

"I think that although many things caused this crisis, what happened to compensation and the incentives in creative risk taking did contribute in some institutions to the vulnerability that we saw in this financial crisis. We need to help encourage substantial reforms in compensation structures particularly in the financial industry."

Prevailing View: Mis-Governance, Duped Investors

Implicit in this view: Managers are out of control; banks like Enron.

Compensation reforms in the US:

- ▶ Compensation czar to not "reward employees for short-term or temporary increases in value"
- ▶ Dodd-Frank legislation increases disclosure of pay packages and shareholder say on pay

Implicit assumption of misalignment with shareholder interests.

Alternative View: Shareholder Pressure

Alternatively, perhaps investors of some firms very much wanted and compensated their managers to take creative risks:

“When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you’ve got to get up and dance. We’re still dancing.”

- *Chuck Prince, Citigroup, July 2007*

Our Paper

We test the alternative hypothesis using a neglected insight from optimal contracting with hidden action and risk-averse agents

- ▶ Empirically, slopes proxied by insider ownership stake seem to have little relation to risk (Prendergast 2002, Fahlenbrach & Stulz 2010) despite the negative relation predicted by the I.C., for many possible reasons
- ▶ Managers' hidden actions may be more important in high risk or price volatility firms and hence insider ownership stakes may not decrease with risk, or may increase
- ▶ Insider ownership stakes subject to personal portfolio choices of overconfident managers (Malmendier and Tate, 2005)

Main Insight

Rather than studying slopes, we take an alternative strategy and study the oft-neglected participation constraint

Key prediction: if slopes have little relation to risk, total compensation must rise with risk to satisfy agent's participation constraint, determined by risk averse preferences

Advantage: Don't need to use insider ownership stakes and hence avoid managerial overconfidence. Use flow pay from firms directly. But can't decompose into levels and slopes.

Results

Our two main findings are as follows:

1. We find that there is a positive link between compensation, measured as payouts to top 5 executives, and risk-taking measures
2. We find that firms with higher payouts and more risk-taking have higher institutional ownership, with little correlation of compensation levels with governance variables

Suggests that compensation is about investors with heterogeneous risk preferences incentivizing firms to take different levels of risk, consistent with contracting theory.

A Simple Model

Suppose output is

$$\tilde{x} = ha + \tilde{\varepsilon}$$

where h reflects agents' marginal productivity, a reflects agents' effort choice, and $\tilde{\varepsilon} = N(0, \sigma^2)$.

Firms may be heterogeneous along h and σ^2 .

Risk-averse CARA agents have a linear sharing rule $s(\tilde{x}) = \alpha + \beta\tilde{x}$ with a risk-neutral principal and maximize payments net of effort cost $c(\cdot)$ and utility loss from risk:

$$\max_a \left\{ \underbrace{\alpha + \beta ha}_{E[s(\tilde{x})]} - c(a) - \frac{\gamma}{2} \beta^2 \sigma^2 \right\}$$

IC vs IR

Familiar equilibrium piece rate (IC, or slope):

$$\beta^* = \frac{1}{1 + \gamma\sigma^2 c''(a^*) / h^2}$$

Participation constraint (IR, or level):

$$T = E[s(\tilde{x})] = \bar{u} + c(a) + \frac{\gamma}{2}\beta^2\sigma^2$$

Intuition

Proposition. *If $\partial\beta^*/\partial\sigma^2 = 0$, then for a wide class of cost functions $c(\cdot)$, $\partial T^*/\partial\sigma^2 > 0$.*

Intuition. Suppose effort cost is quadratic, and $[\partial h/h] / [\partial\sigma^2/\sigma^2] = 1/2$: in the cross-section, high marginal productivity firms are also high risk firms.

- (IC) $\partial\beta^*/\partial\sigma^2 = 0$. Want to give agents more incentives at risky firms (high marginal productivity of effort), but this is costly (risk aversion)
- (IR) $\partial T^*/\partial\sigma^2 > 0$. Agents at high risk firms will be paid more for extra work and extra insurance

$$T = \bar{u} + c(a) + \frac{\gamma}{2}\beta^2\sigma^2$$

Measuring Compensation

The testing whether the level of pay T^* increases with risk, we look at what firms pay annually to their top managers (total flow pay)

Flow pay captures compensation practices of principals

- ▶ Less contaminated by cumulated decisions of managers in the past which influence current level of insider stakes

This implies we cannot use the flow pay to test any predictions about the IC constraint, but focus is on the IR constraint

Adjusting for Size and Industry

Look at total direct compensation (bonuses, salary, non-cash pay) to top 5 executives, 1992-2008

- ▶ Data for compensation comes from ExecuComp, risk and price measures from other sources

Control for firm size since best people work for biggest firms, different finance sub-industries

- ▶ These are already netted out in the theory

Three classifications of finance sub-industries: primary dealers, banks/bank-holding-companies, and insurers

Up and Down Years

Ad-hoc split for simplicity across two periods when markets rose and fell. Similar results when pooling data.

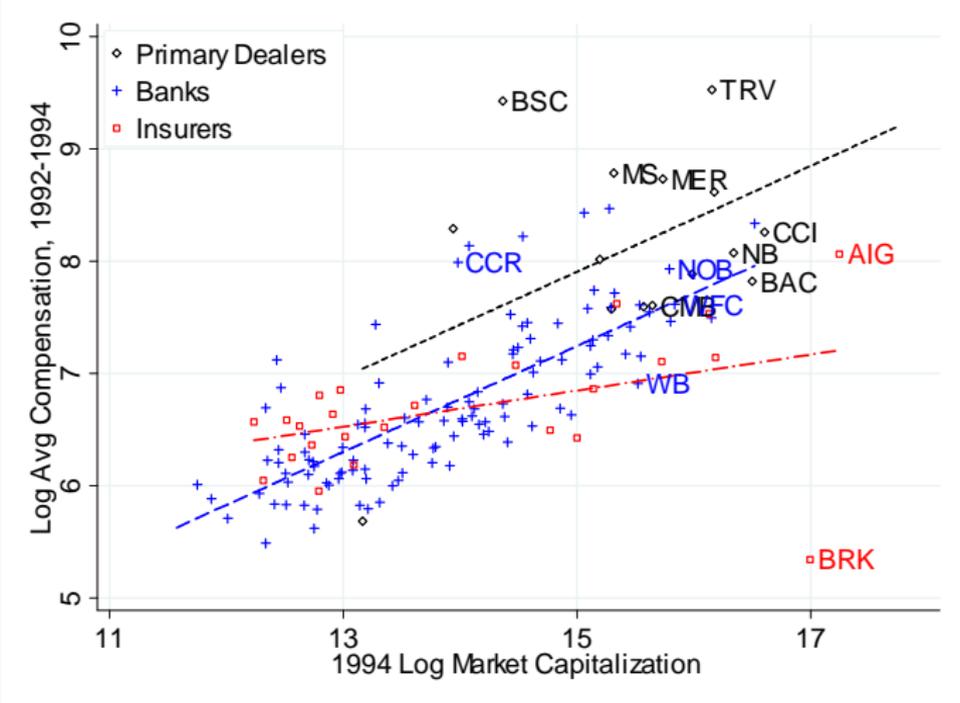
Early Sample

- ▶ 1992-1994, compute average total pay of top 5 executives, residual firm size by industry
- ▶ 1995-2000, compute risk measures

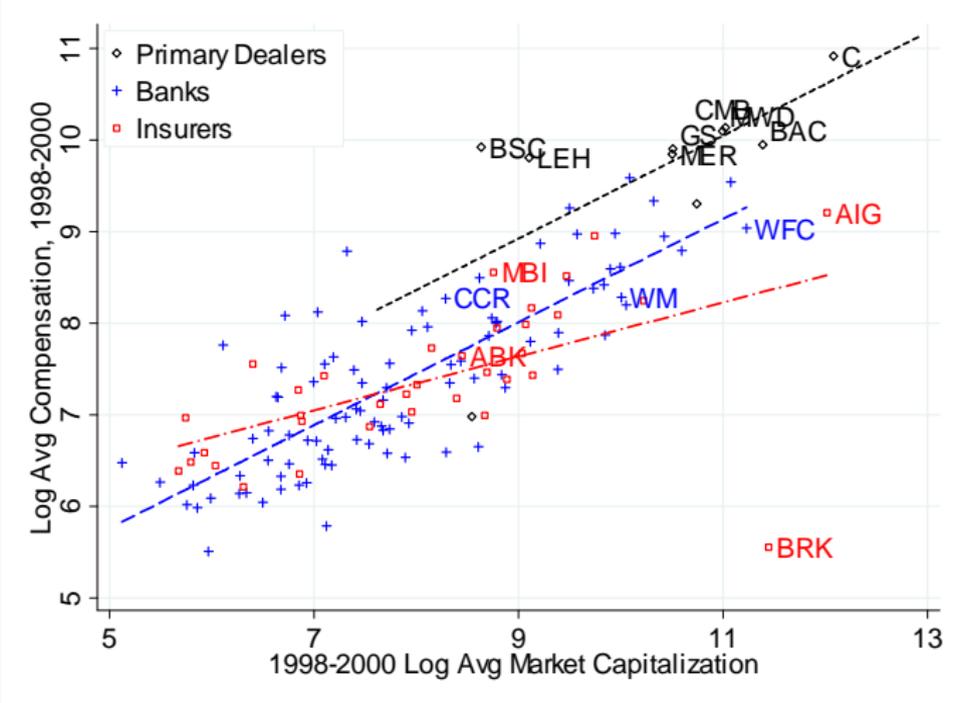
Late Sample

- ▶ 1998-2000 for residual compensation
- ▶ 2001-2008 for risk

Residual Compensation 1994



Residual Compensation 2000



Persistence

Strong persistence in residual compensation levels

- ▶ Correlation of residuals across two periods is 0.76. Weak economic significance for Returns and CEO Turnover

	Residual Comp. (1998-2000)	Residual Comp. (1998-2000)
Residual Comp. (1992-1994)	0.8258 [7.6847]***	0.8411 [7.4853]***
Returns (1995-1997)		-0.0504 [-0.7256]
CEO Turnover (1995-1997)		-0.0245 [-0.2132]
Constant	-0.0507 [-1.1615]	0.0033 [0.0400]
R^2	0.5723	0.5833

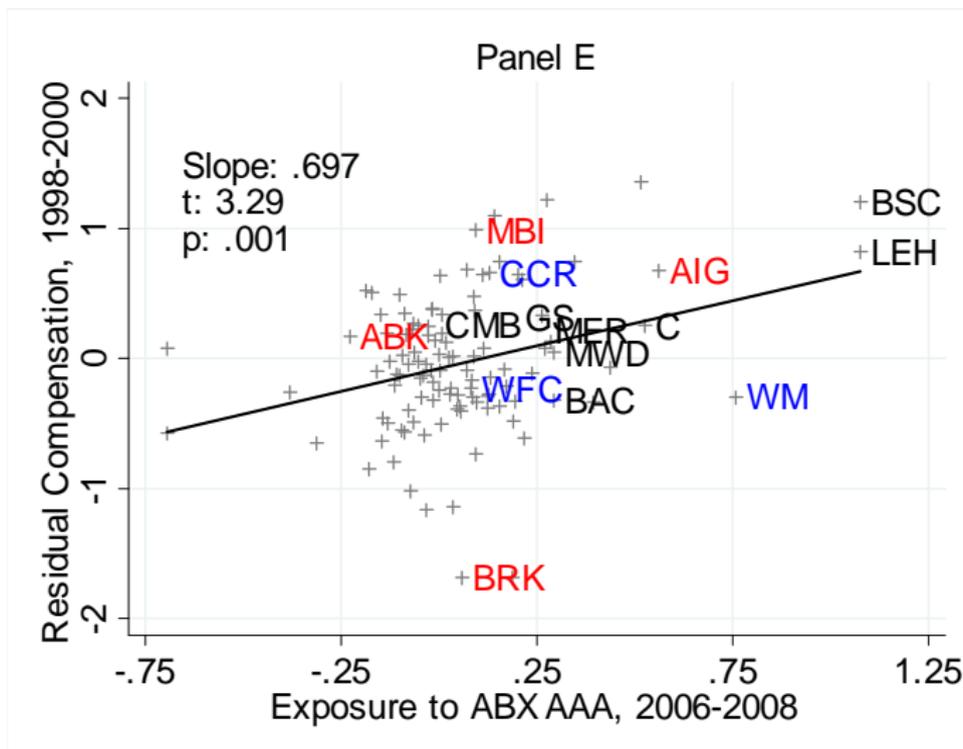
Risk and Compensation

Positive relationship between risk and level of compensation

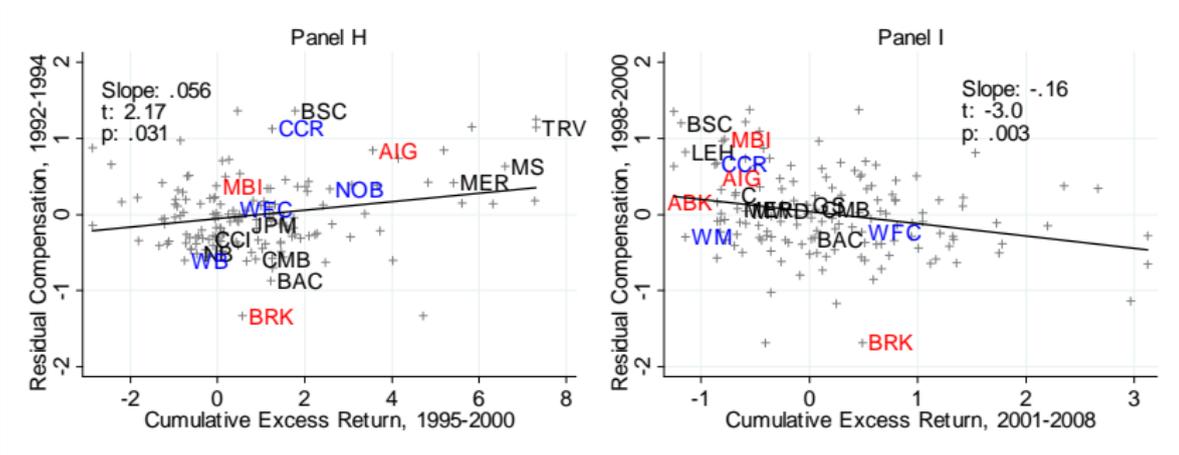
- ▶ Near-zero relationship between incentive slope and risk (similar to Fahlenbrach and Stulz, 2010)

	LHS:	Resid. Comp.	Insider Ownership
RHS: Price Risk Score	Early Period	0.2319	-0.0027
		[3.7198]***	[-0.4211]
	Late Period	0.3008	-0.0146
		[3.1127]***	[-1.0216]
Excess Returns	Early Period	0.0556	0.0002
		[2.1758]**	[0.1184]
	Late Period	-0.1597	0.0184
		[-3.0175]***	[1.5473]

Stock Price Exposure to ABX AAA



Residual Compensation and Performance



Economic Significance

Typically a one-standard deviation of risk is associated with residual compensation that is 0.15-0.30- σ higher

- ▶ Example: one-sigma increase in ABX exposure is associated with a 0.32- σ increase in compensation

High residual comp list includes a variety of firms, big and small, in various industries

- ▶ Fremont, Riggs, Hartford Financial, BSC, MBIA

Other Findings and Robustness

Robust to the following checks:

1. Calculating residual compensation controlling for asset value instead of market cap
2. Controlling for book leverage on the right hand side (heterogeneity not just book leverage)
3. Excluding CEO when computing residual pay
4. Works in non-financial industries (but heterogeneity is a larger concern)

Mis-Governance or Shareholder Demand?

Governance measures not correlated with compensation or risk-taking measures

High residual compensation, high risk-taking firms, also have high institutional ownership and high stock turnover

RHS (columns):					
LHS (rows):	G Index	E Index	% Indep. Directors	Institution Own.	Stock Turnover
Residual	0.0044	-0.009	0.1217	0.936	3.9324
Comp.	[0.2312]	[-0.2106]	[0.2885]	[3.9281]***	[3.0439]***
Price Risk	0.0217	0.0369	0.5069	0.5345	6.2789
Score	[0.9320]	[0.7458]	[1.0928]	[1.8050]*	[3.2620]***

Suggests investor heterogeneity related to contract heterogeneity, particularly for institutions (Hartzell and Starks, 2003)

Conclusions

Evidence that high compensation is persistent and related to high risk and tail performance

- ▶ Consistent with implications of participation constraint from classical agency theory
- ▶ But not an Enron-style story of naïve investors and out-of-control managers per se

Institutional ownership suggests less of an issue with governance vis a vis investors with heterogeneous risk preferences incentivizing firms to take different levels of risk.