

Yesterday's Heroes: Compensation and Creative Risk Taking

Ing-Haw Cheng* Harrison Hong** Jose Scheinkman**

*University of Michigan

**Princeton University and NBER

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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."

Consistent with compensation reforms in the US (e.g., "say on pay"), strong 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

- ▶ Slopes proxied by insider ownership stake have little relation to risk despite negative relation predicted by IC, for many possible reasons (Prendergast 2002)
- ▶ Example: managerial actions may be more important in high risk firms

Idea. Participation constraint can yield additional empirical insight.

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

Results

Strategy. We use flow pay from firms to directly test this prediction.

Main findings. Our two main findings are as follows:

1. There is a positive link between compensation, measured as payouts to top 5 executives, and risk-taking measures
2. 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 Motivating Model

Suppose output is \tilde{x} , with CARA agent effort a :

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

Modification. Firms may be heterogeneous among both h (marginal productivity of agent) and σ .

Linear sharing rule $s(\tilde{x}) = \alpha + \beta\tilde{x}$ with risk-neutral principal.

Maximize payments net of effort cost $c(\cdot)$ and utility loss from risk:

$$\max_a \left\{ \alpha + \beta ha - c(a) - \frac{\gamma}{2} \beta^2 \sigma^2 \right\}$$

IC vs IR

IC. Familiar equilibrium piece rate (slope):

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

IR. Participation constraint (level):

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

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

Intuition. Suppose high marginal productivity firms are also high risk firms in the cross-section (high $h \Leftrightarrow$ high σ). Then:

- (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

Similar flavor of results in more elaborate models (Edmans and Gabaix, 2010; Axelson and Bond, 2009).

Empirical Strategy

To test 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

Look at total direct compensation to top 5 executives (ExecuComp financial firms), 1992-2008

- ▶ **Residual compensation:** compensation adjusted for firm size, industry-effects
- ▶ Best people work for biggest firms

Up and Down Years

Relate residual compensation to ex post measures of risk.

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

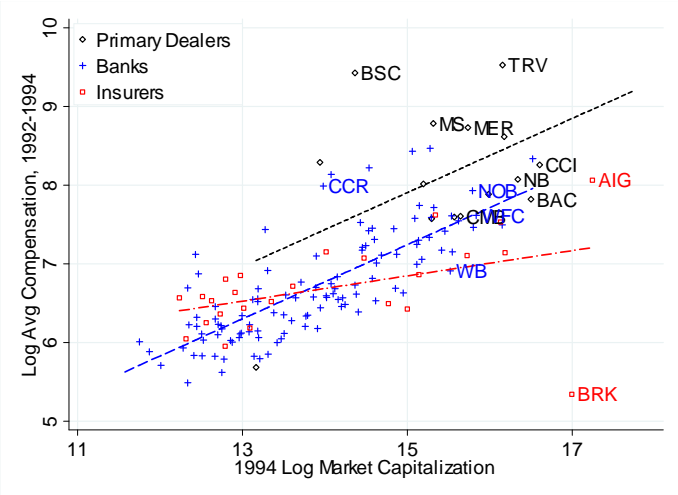
Early Sample

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

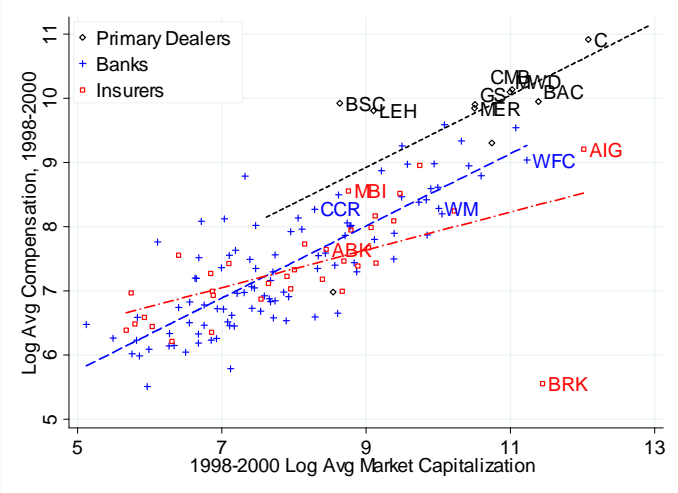
Late Sample

- ▶ 1998-2000 for residual compensation
- ▶ 2001-2008 for ex post 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

	Resid. Comp. (1998-2000)	Resid. Comp. (1998-2000)
Residual Comp. (1992-1994)	0.8283 [7.5952]***	0.8456 [7.3983]***
Returns (1995-1997)		-0.0541 [-0.7754]
CEO Turnover (1995-1997)		-0.0285 [-0.2459]
Constant	-0.0532 [-1.2138]	0.0054 [0.0643]
R-Squared	0.5697	0.582

Risk and Compensation

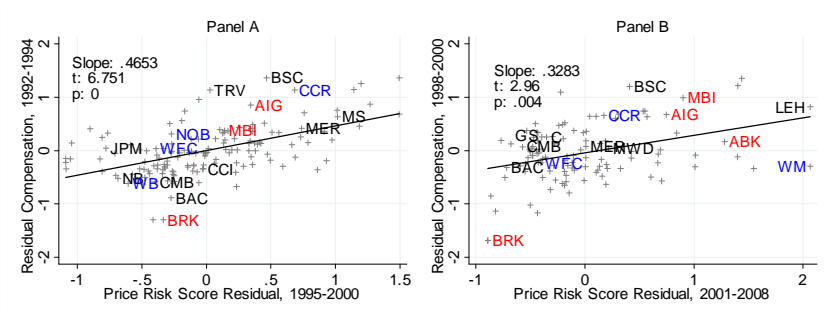
Positive relationship between risk and level of compensation

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

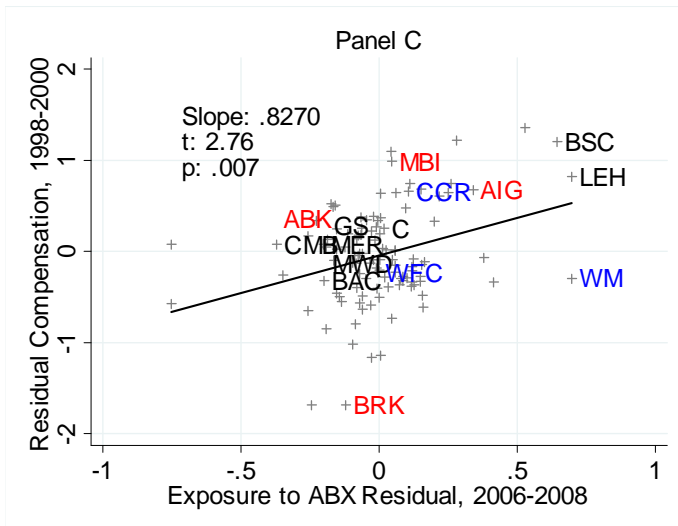
RHS:	LHS:	Resid. Comp.	Insider Ownership
Price Risk Score	Early Period	0.4654 [6.7511]***	0.0089 [1.0425]
	Late Period	0.3283 [2.9599]***	-0.0061 [-0.4582]
Excess Returns	Early Period	0.0746 [2.9088]***	0.003 [1.4767]
	Late Period	-0.1647 [-2.9093]***	0.018 [1.4594]

Price-Based Risk Score

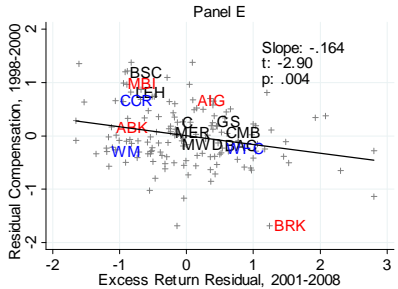
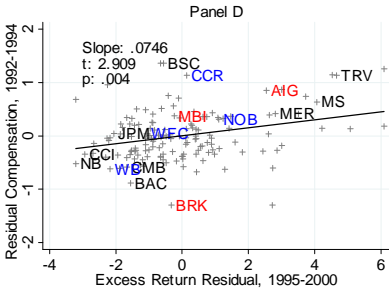
Average z-scores for Beta, Volatility, and ABX Exposure



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 0.37- 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)

Ownership results robust to alternative measures (\$ stake, etc.).

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 Ownshp
Resid. Comp.	0.0053 [0.2592]	-0.0073 [-0.1575]	0.1677 [0.3932]	1.1744 [4.2020]***
Price Risk	0.0215 [0.9766]	0.0281 [0.5650]	0.607 [1.2495]	1.0238 [3.2783]***

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.

Helps reconcile academic view that incentives did not correlate with risk with broader view that pay and risk are related.