Behavioral Corporate Finance

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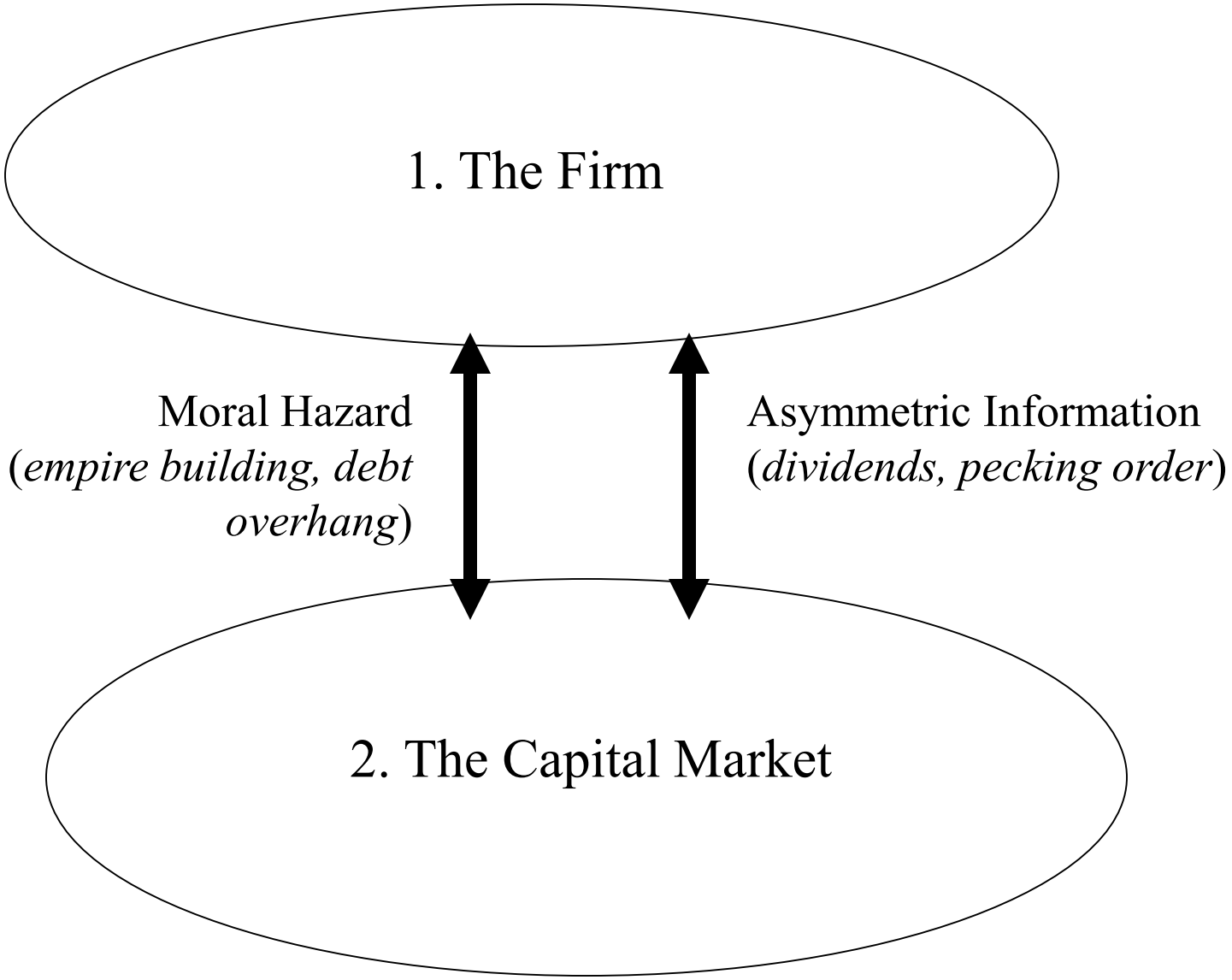
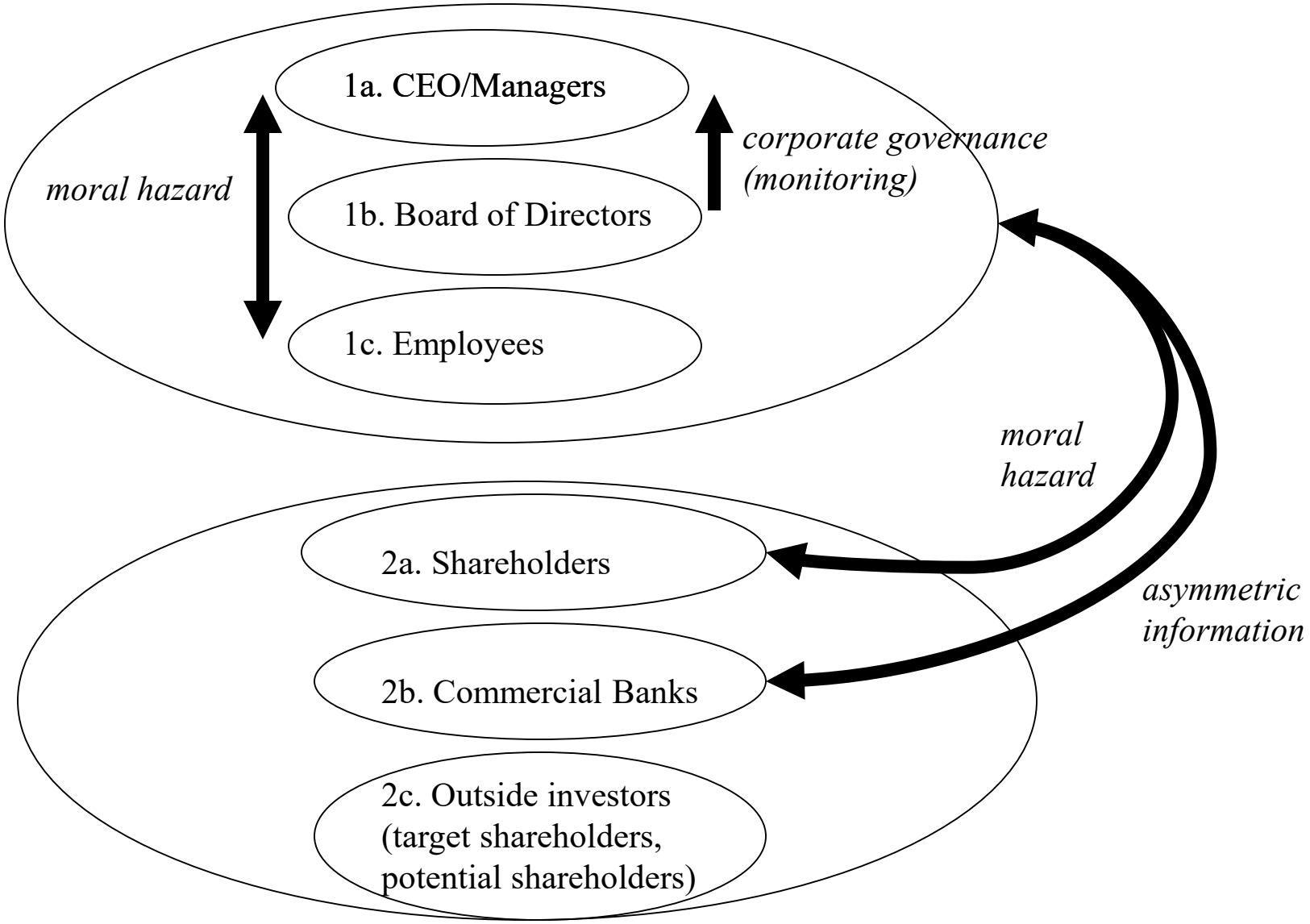
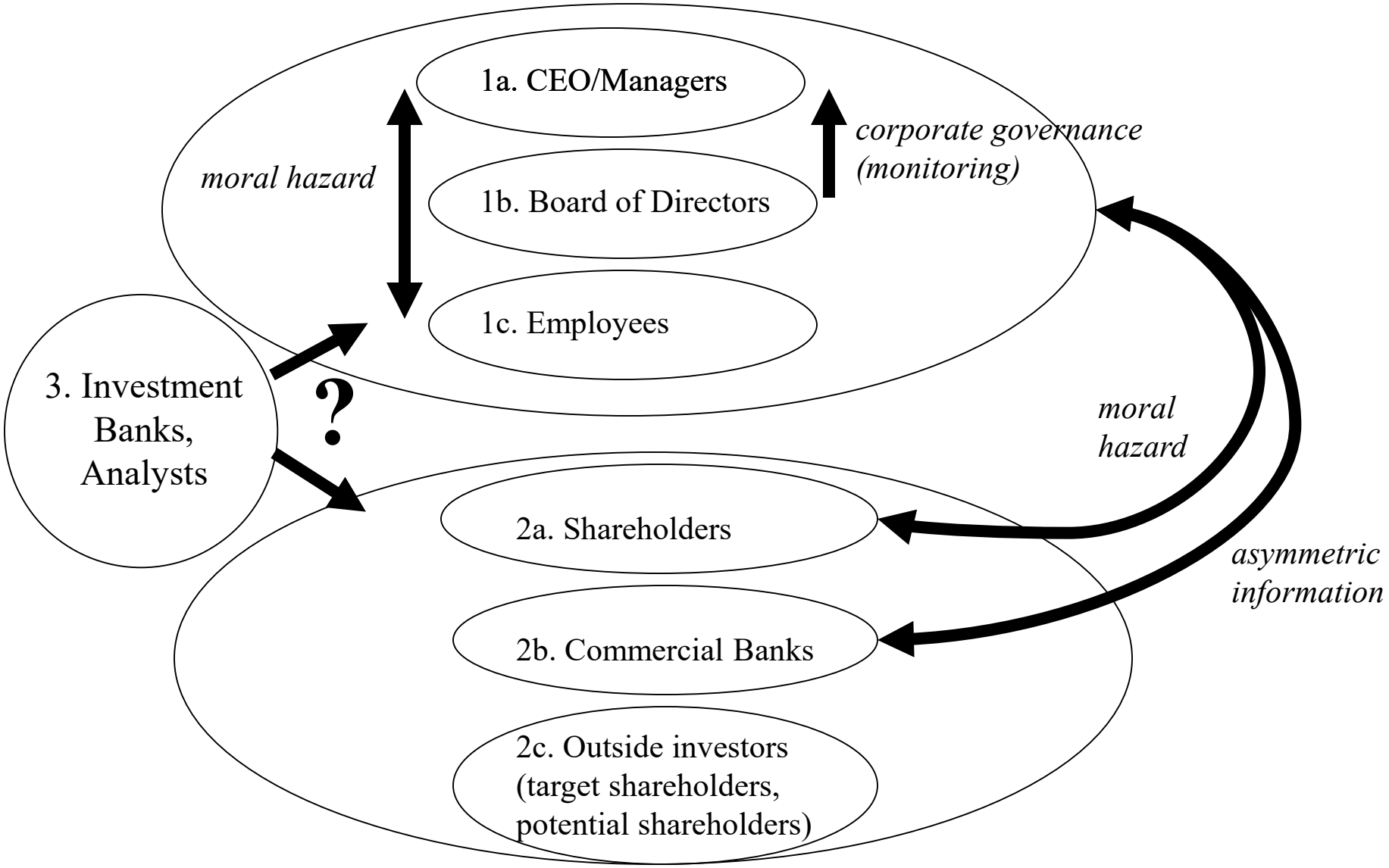
Corporate Finance … in a nutshell



Corporate Finance … zooming in



Corporate Finance … zooming in (II)



"What is CF?" in practice …

- Much broader than "corporate" (small firms, entrepreneurs, analysts, microfinance) and "finance" (any decision-making).
- Strong links to other empirical fields (PF, labor/organizational economics, devo), theory (contract theory/org econ)
  - Examples devo: microfinance
  - Example political economy: stock price reaction to bribes
  - Examples PF: dividends, taxes (agency, asymmetric info)
  - http://conference.nber.org/confer/ → Check out Spring / Fall / SI "CF" and "BF" programs over the last couple of years
- So what is the separation from Applied Micro?
  - partly methodology (e.g. SE.s: Fama-McBeth vs. clustering); Petersen: kellogg.northwestern.edu/faculty/petersen/htm/papers/standarderror.html
  - partly data demands + advantages
  - partly job market requirements (AP, lingo, …) + advantages

Behavioral Corporate Finance

Systematic deviations from our standard model of rational decision-making.

Two perspectives:

Perspective 1: ***Investor biases***

→Non-standard investor behavior ("investor sentiment")

→Managerial response = Non-standard corporate finance policies (cf. "Behavioral IO")

Perspective 2: ***Managerial biases***

→Non-standard corporate finance policies

→Market response

Perspective 1: Biased Investors

- **Non-standard investor behavior:** Systematic deviations from rational/traditional-model individual investment decisions (investor sentiment), e.g. loss aversion, overconfidence, "experience effects" (on risk attitudes)
- **Managerial response**: Implications for corporate decisions which involve the market (equity issues, equity-financed mergers, equity-financed mergers).
    - Cf. "Behavioral IO"

Examples

- Investors sentiment → Timing of security issuances (*Baker and Wurgler, 2000; 2002*)
- Timing of mergers (*Shleifer and Vishny, 2003*)
- Employee sentiment → Stock-based compensation to lower-level employees (*Oyer, 2004; Bergman and Jenter, 2005*)

Perspective 2: Biased Managers

- **Managerial biase**s: Systematic deviations from rational/traditional-model corporate decisions, e.g. overconfidence, experiences, "traits"
- Inducing non-standard corporate policies, i.e., implications for
  - for investment decisions, financing decisions, resulting capital structure, mergers & acquisitions.
  - for role of the board / corporate governance (e.g. options vs debt overhang)
  - for internal labor market (role of tournaments, design of compensation contracts)
    - "Organizational Fixes" (Camerer and Malmendier (2007), Behavioral Economics of Organizations)
- **Market response**

Perspective 2: Biased Managers

Examples

- Overconfidence of CEOs →
  "Urge to merge" / to overinvest
  Malmendier and Tate, 2005, 2008, 2016 (JEP!)
- Experience bias of CEOs (economic depressions, military service, …) →
  Conservatism in investment, debt aversion
  Malmendier, Tate, and Yan, 2011; Schoar 2012; Benmelech and Frydman 2012

"Perspective 3": Other Players

E.g., analyst biases

- Systematic deviations from rational evaluation of companies, e.g. representativeness (stereotypes such as "losers" and "winners").
- Implications for corporate decisions such as earnings manipulation, budgeting to exceed thresholds.

E.g., rating agencies

E.g., regulators / law makers

E.g., central bankers (making of hawks and doves through their lifetime experiences) → funding

"Why work in Behavioral CF?"

= Instead helping the poor, remedying inequality, saving the world etc., why obsess about the rich businessmen and financial markets?

Three Pitches:

- "Saving the world:" biases in managers, manager exploiting biases in investors (It can be helpful to study the rich and powerful because of their influence.)
- Market interaction ("Psychology & Economics"), data: Behavioral CF at the forefront (Behavioral IO)
- Laboratory ("convenience sample"): detailed data, pictures

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Will start from "market interaction", with some "saving the world."

Application: M&A

Some stylized facts:

1. Huge economic significance (whether measured in dollar value of deals, dollar value of firms involved, shareholder value destroyed at announcement, job lost/created/changed, ..)
2. Mergers occur in waves.
3. Within a wave, mergers occur in industry clusters.
4. Merger financing
   * 1970s, 1980s: 45% (at least some) stock financing
   * 1990s: 70% (at least some) stock-financing
   * 2000s+ somewhat of a reversal
5. Negative effect on value for shareholders of acquiring company at announcement (on average or for a large portion), esp. in stock-financed mergers

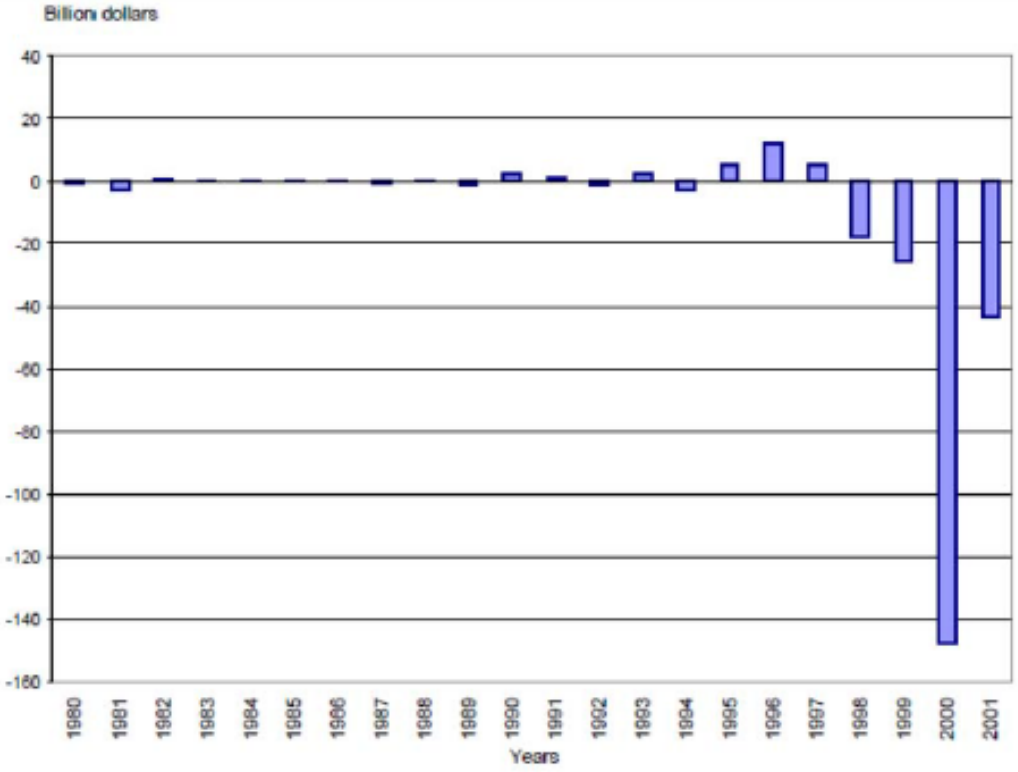

Figure 1. Yearly aggregate dollar return of acquiring-firm shareholders (1980 to 2001). Data are from the SDC Mergers and Acquisitions Database. The graph shows the aggregate dollar return associated with acquisition announcements for each sample year. The aggregate dollar return is defined as the sum of the product of the abnormal return of each announcement multiplied by the equity capitalization of the acquirer.

Moeller, Schlingemann, Stulz (2005): From 1991 to 2001 acquiring firms' shareholders lost $216bn in aggregate!
(more than 50x the $4bn lost 1980-1990)

Behavioral Perspectives

Perspective 1: Misvaluation of Investors

→"Investor sentiment"

→Managerial response: timing of mergers, in particular of stock-financed mergers

Perspective 2: Misvaluation of managers

→"CEO overconfidence"

→Market response: limited willingness to finance overestimated mergers (hence sensitivity to available internal funds); negative stock-price reaction to overestimated mergers

M&A – Perspective 1: Misvaluation of Investors

(Baker-Wurgler Agenda; Shleifer-Visnhy (2003))

Model. Two firms A and T with

- Capital Stock: K_A and K_T
- "Short-Run" (Current) Value:

$$\widetilde{V}_A = S_A K_A$$
$$\widetilde{V}_T = S_T K_T$$
$$\widetilde{V} = S(K_T + K_A)$$

w.l.o.g. $S_A > S_T$. (S, S_A, S_T are valuations per unit of capital.)
(Typical case: $S_A > S > S_T$.)

$\Longrightarrow$ Short-run gains (perceived synergies) from mergers: $\widetilde{V} - \widetilde{V}_A - \widetilde{V}_T$

$\Longrightarrow$ For example, zero perceived synergies if S such that

$$S(K_A + K_T) - S_A K_A - S_T K_T = 0$$

- "Long-Run" Values:

$$V_A = qK_A$$
$$V_T = qK_T$$
$$V = q(K_A + K_T)$$

  $\Longrightarrow$ Long-run gains (synergies) from mergers: 0.

- Managers act in own (= existing shareholders') interest and exploit market irrationalities.
- Investors draws no inferences about the **LR** from merger announcements!

Typical Case: A acquiring T

- A pays cash PK_T ($\geq S_T K_T$)
  - E.g. $P = S_T \Longrightarrow$ No takeover premium.
  - E.g. $P = S \Longrightarrow$ Payment proportional to **SR** combined value.
- Announcement effects
  - Acquirer:

$$\begin{aligned} & S(K_A + K_T) - PK_T - S_A K_A \\ = \; & (S - S_A)K_A + (S - P)K_T \end{aligned}$$

  - Target:

$$(P - S_T)K_T$$

$\Longrightarrow$ A-shareholders lose from perceived dilution ($S - S_A < 0$) or gain from "money machine" ($S - S_A > 0$)

$\Longrightarrow$ A-shareholders gain from high SR assessment of synergy relative to price ($S - P > 0$).

- Long-run abnormal returns if cash payment
  - Combined: $0 = q(K_A + K_T) - qK_A - qK_T$.
  - For A-Shareholders: $(q - P)K_T \longrightarrow$ Why?
    Answer: $q(K_A + K_T) - PK_T - qK_A$.
  - For T-Shareholders: $(P - q)K_T \longrightarrow$ Why?

Stock payment

Assume $T-$shareholders get fraction $x = \frac{PK_T}{\tilde{V}} = \frac{PK_T}{S(K_A+K_T)}$.

- Short-run abnormal returns identical (by construction: $(1-x)\cdot ... = ... - PK_T$)
- Long-run abnormal returns if stock payment
  - Combined Value: 0
  - For A-Shareholders: $q(1-\frac{P}{S})K_T \longrightarrow$ Why? *Answer:*

$$\begin{aligned} q(1-x)(K_A+K_T) - qK_A &= q(K_T - x(K_A+K_T)) \\ &= q\left(1 - \frac{PK_T}{S(K_A+K_T)}\frac{K_A+K_T}{K_T}\right)K_T \\ &= q\left(1-\frac{P}{S}\right)K_T \end{aligned}$$

  - For T-Shareholders: $q(\frac{P}{S}-1)K_T \longrightarrow$ Why? *Answer:* Has to be 1- ....

A-**Shareholders:** $q(1-\frac{P}{S})K_T$

$\Longrightarrow$ In the LR, *A*-shareholders gain from high valuation $(S-P>0)$.

$\Longrightarrow$ Compare to gains/losses with cash financing $(q-P)K_T$.

$\Longrightarrow$ Compare to gains/losses in the SR $(S-S_A)K_A+(S-P)K_T$.

Result: Difference between LR value creation and LR (mean-reversion) returns.

- LR return of *A* without acquisition: $(q-S_A)K_A$. (Negative if *A* initially overpriced.)
- *Incremental* LR return of *A* from acquisition: $(1-\frac{P}{S})qK_T$. (Positive if $P<S$.)

$\Longrightarrow$ In the LR, *A*-shareholders gain from high valuation $(S-P>0)$ even if overall LR return is negative. ("Not as negative as they would have been without the acquisition.")

Conclusions: Predictions of Market Timing Theory

1. Characteristics of stock mergers
   - Acquirer has high prior returns. $\Longrightarrow q \leq P < S$.
   - Acquirer overvalued (signs: earnings manipulation, insider selling)
   - Stock mergers disporportionately high when aggregate or industry valuations are high.
   - Stock mergers disporportionately high when valuations are highly disperse.
2. Characteristics of cash mergers
   - Target has low prior returns (is undervalued) $\Longrightarrow q > P \geq S_T$.
   - Cash mergers disporportionately high when aggregate or industry valuations are low.

Supportive evidence by Rhodes-Kropf and Vishnawathan (2004)

Perspective 2: Misvaluation of Managers (Overconfidence)

(Roll 1986; Malmendier and Tate 2003, 2007, 2011, 2015)

Model. Single acquiror, e.g., with full bargaining power (akin to $p = S_T$)

- Market value of acquiror $A = V_A$; A-manager's valuation of $A = \widehat{V}_A$.
- Market value of target $T = V_T$.
- A has access to internal resources C (cash and other non-diluting assets); uses $c \leq C$ to pay target shareholders. If no merger takes place, c is 0 (and the full C is part of the firm value V_A).
- Target shareholders are paid with c and/or shares of the merged company.
- Market value of the combination of A and T after paying out $c = V(c)$; A-manager's valuation of the combination of A and $T = \widehat{V}(c)$.

- Overconfident A-manager
  - overvalues own company: $\widehat{V}_A > V_A$,
  - overvalues the merger, $\widehat{V}(c) - V(c) > \widehat{V}_A - V_A$ for some c.
- How much does CEO pay for T? How much in shares after cash payment c? How does it depend on overconfidence?

  Answer: Since the acquiring firm has all the bargaining power, it pays V_T for the target, independent of the CEO's overconfidence.

  For a given amount $c < V_T$ of cash financing, target shareholders demand a share s of the merged company such that $sV(c) = V_T - c$.
- When does a rational CEO conduct the takeover?

  Answer: iff $V(c) - (V_T - c) > V_A$.

- Denoting the merger synergies as $e \in R$, we can decompose $V(c)$ into

$$V(c) = V_A + V_T + e - c.$$

$\Longrightarrow$ Rational CEO makes the first-best acquisition decision: acquires iff $e > 0$, *independently* of the available C.

$\Longrightarrow$ Since the capital market is fully efficient, there is no extra cost of raising external capital to finance the merger and the CEO is indifferent among cash, equity, or a combination.

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- When does an overconfident CEO conduct the takeover?

Answer: Overestimates the returns to merging, but also believes that (partial) equity financing entails a loss to current shareholders of

$(\frac{V_T - c}{V(c)} - \frac{V_T - c}{\widehat{V}(c)})\widehat{V}(c) = \frac{V_T - c}{V(c)}(\widehat{V}(c) - V(c))$

- $\Longrightarrow$ iff $(1-s)\widehat{V}(c) > \widehat{V}_A$ for some $c \leq \bar{c}$
  $\Longrightarrow$ substituting $sV(c) = V_T - c \Longleftrightarrow s = \frac{V_T - c}{V(c)}$:

$$\begin{aligned} & \widehat{V}(c) - \frac{V_T - c}{V(c)}\widehat{V}(c) \\ = \; & \widehat{V}(c) - (V_T - c) - (V_T - c)\frac{\widehat{V}(c) - V(c)}{V(c)} > \widehat{V}_A \end{aligned}$$

- Denoting the "perceived" additional merger synergies as $\widehat{e} \in R_{++}$, we can decompose $\widehat{V}(c)$:

$$\widehat{V}(c) = \widehat{V}_A + V_T + e + \widehat{e} - c.$$

  $\Longrightarrow$ Overconfident CEO acquires iff $e + \widehat{e} > \frac{V_T - c}{V(c)}(\widehat{V}(c) - V(c))$.
  $\Longrightarrow$ That is, he merges whenever actual and perceived merger synergies exceed the perceived loss due to dilution.

Conclusions: Predictions of Hubris Hypothesis

- **Implication 1:** An overconfident CEO exhausts his supply of internal (non-diluting) assets before issuing equity to finance a merger.
- **Implication 2:** A rational CEO never conducts a value-destroying merger. An overconfident CEO does a value-destroying merger if perceived synergies $\hat{e}$ are sufficiently large relative to perceived undervaluation $(\widehat{V}_A - V_A)$ and the portion of the deal financed by equity $\frac{V_T - c}{V(c)}$.
- **Implication 3:** (i) If $C \geq V_T$, an overconfident CEO conducts any merger a rational CEO would conduct and some mergers a rational CEO would not. (ii) If $C < V_T$, an overconfident CEO does some (value-destroying) mergers a rational CEO would not and a rational CEO does some (value-creating) mergers that an overconfident CEO would not.

Empirical Predictions

- **Prediction 1.** Overconfident CEOs are more likely to conduct mergers with a high probability of failure and negative expected returns.
- **Prediction 2.** Among CEOs with abundant internal resources (e.g. large cash reserves and low leverage), overconfident CEOs are more likely to conduct acquisitions.
- **Prediction 3.** The expected returns to merger announcements are lower for overconfident than for non-overconfident CEOs.

Empirical Approach

Most common approach to measuring CEO OC in behavioral finance literature (introduced in Malmendier and Tate, 2005; but better see JEP 2015):

Use decisions that the executive makes on his or her **personal portfolio** of company stock options. (Typical 10-year duration, typically vested after 4 yrs.) $\rightarrow$ Link to **corporate decision**.

Note: successful approach for borrowing, leverage, ... ("CEOs as laboratory.")

Measure: CEO holds options all the way to expiration (at least 40% in the money) have taken a long-term bet on the future performance of their company's stock, despite their under-diversification.

Empirical Approach

Background: Since the 1980s (particularly in the 1990s), top US executives have received increasingly large stock and option grants as part of their compensation (Hall and Murphy 2003).

$\rightarrow$ under-diversified w.r.t. company-specific risk.

$\rightarrow$ CEOs have a limited ability to address this issue (e.g., restricted stock [time-based vesting or performance-based vesting]; stock options not tradeable and typically also take years to vest; executives are contractually prohibited from taking short positions in the company's stock.)

Empirical Approach

Logic:

- Rational, risk-averse executive should seek to exercise stock options (once vested) in order to diversify.
  - Exact timing of optimal option exercise depends on "moneyness" of the options, risk aversion, and extent of under-diversification (Lambert, Larcker, and Verrechia 1991; Hall and Murphy 2002).
- OC executives overestimate future performance of their firms

  $\rightarrow$ More willing to hold options, expecting to profit from expected stock price appreciation.

  $\rightarrow$ Systematic tendency to hold options longer before exercise as a measure of overconfidence.

Measure: CEO holds options all the way to expiration (at least 40% in the money) have taken a long-term bet on the future performance of their company's stock, despite their under-diversification.

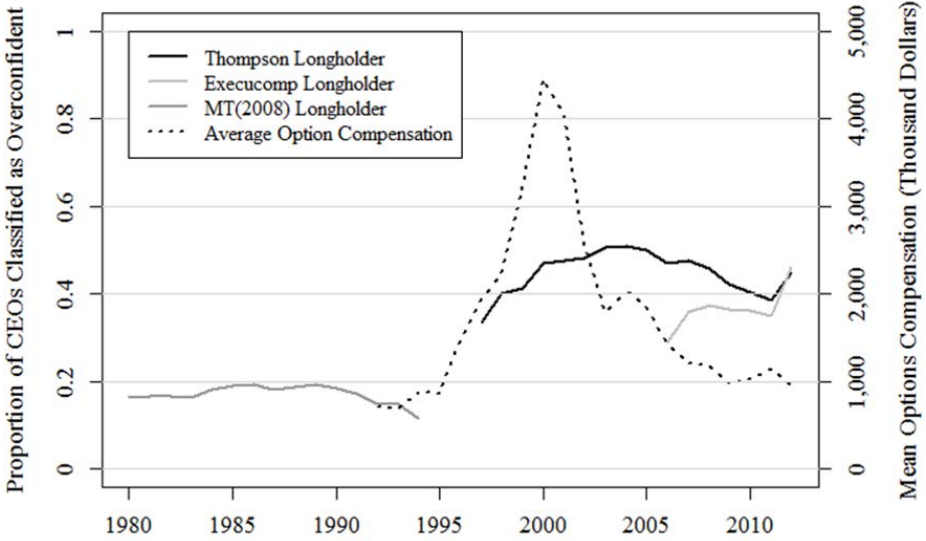
Data

Original "Longholder" measure constructed from Hall and Liebman (1998) data (CEO stock and option holdings in Forbes 500 companies from 1980 to 1994).

Updated Longholder

1. Thomson Reuters' Insider Filings database for the 1996-2012 time period
2. Compustat's ExecuComp database in the format available after 2006

Figure 1: Option-Based Overconfidence Measure



Empirical Specification

$$\Pr(Y_{it} = 1|X, O_{it}) = G(\beta_1 + \beta_2 O_{it} + X^T \gamma)$$

where i: company, t: year, Y: acquisition dummy (yes or no),
O: overconfidence, X: set of controls, G: logistic distribution

$\rightarrow H_0 : \beta_2 = 0$ (overconfidence does not matter)
$\rightarrow H_1 : \beta_2 > 0$ (overconfidence does matter)

Table 3: Do Overconfident CEOs Complete More Mergers?

	Fixed-effects logit			Random-effects logit		
	(1)	(2)	(3)	Baseline (4)	Cash rich (5)	Cash poor (6)
Size	0.6537	0.6600	0.3278	0.9022	0.9480	0.9177
	(2.50)**	(2.42)**	(3.42)***	(1.49)	(0.50)	(1.03)
Q	0.7135	0.7154	0.9062	0.7019	0.7686	0.6839
	(2.20)**	(2.18)**	(0.45)	(2.96)***	(1.25)	(2.70)***
Cash flow	2.0231	2.0377	1.6607	1.5427	0.9948	1.8719
	(1.72)*	(1.72)*	(0.67)	(2.07)**	(0.01)	(2.35)**
Stock ownership	0.3840	0.3813	0.0418	1.4084	21.4335	0.7232
	(0.95)	(0.96)	(0.70)	(0.36)	(1.80)*	(0.29)
Vested options	0.4566	0.4595	0.6384	1.2165	4.2168	1.3186
	(3.97)***	(3.93)***	(0.51)	(0.46)	(0.91)	(0.63)
Efficient board size	1.0817	1.0811	1.8488	0.8012	0.575	0.9184
	(0.40)	(0.40)	(2.10)**	(1.55)	(2.44)**	(0.48)
Longholder	2.1891			1.7447	1.9728	1.5471
	(2.70)***			(3.21)***	(2.53)**	(2.10)**
Post-Longholder		1.8642				
		(1.91)*				
Pre-Longholder		2.3305				
		(2.72)***				
Holder 67			2.5159			
			(2.49)**			
Firm fixed effects	Yes	Yes	Yes	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,568	2,568	853	3,540	1,227	2,313
Number of firms	225	225	124	322	282	314

z-Statistics in parentheses. Constant included.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Alternative Explanations

1. Inside Information or Signaling
   - Mergers should "cluster" in final years of option term
   - Market should react favorably on merger announcement
   - CEOs should "win" by holding
2. Stock Price Bubbles
   - Year effects already removed
   - All cross-sectional firm variation already removed
   - Lagged stock returns should explain merger activity
3. Volatile Equity
4. Finance Training

Finance Education

Longholder = holds options until last year before expiration (at least once)
Distribution: Logistic. Constant included.
Dependent Variable: Acquistion (yes or no); **Normalization:** Capital.

	logit with controls	random effects logit	fixed effects logit
Size	**0.7624**	**0.7536**	**0.1998**
	(2.27)**	(2.49)**	(3.96)***
Q_{t-1}	**0.8624**	**0.8514**	**0.6985**
	(1.24)	(1.01)	(1.32)
Cash Flow	**1.0686**	**1.0389**	**0.9442**
	(0.24)	(0.14)	(0.13)
Ownership	**1.0163**	**0.8967**	**18.3462**
	(0.01)	(0.06)	(0.31)
Vested Options	**1.2847**	**1.3302**	**3.7916**
	(0.28)	(0.22)	(0.73)
Governance	**0.5132**	**0.5515**	**1.2581**
	(3.01)***	(2.51)**	(0.72)
Finance Education	**1.5500**	**1.6434**	**3.2946**
	(2.00)**	(2.17)**	(1.46)
Longholder	**1.7248**	**1.8757**	**5.6952**
	(2.29)**	(2.42)**	(1.51)
Year Fixed Effects	no	no	yes
Observations	1489	1489	819
Firms	188	188	83

Robustness

Do the results hold as we vary the percentage in the money required for a holder to be overconfident?

Yes.

Odds Ratios

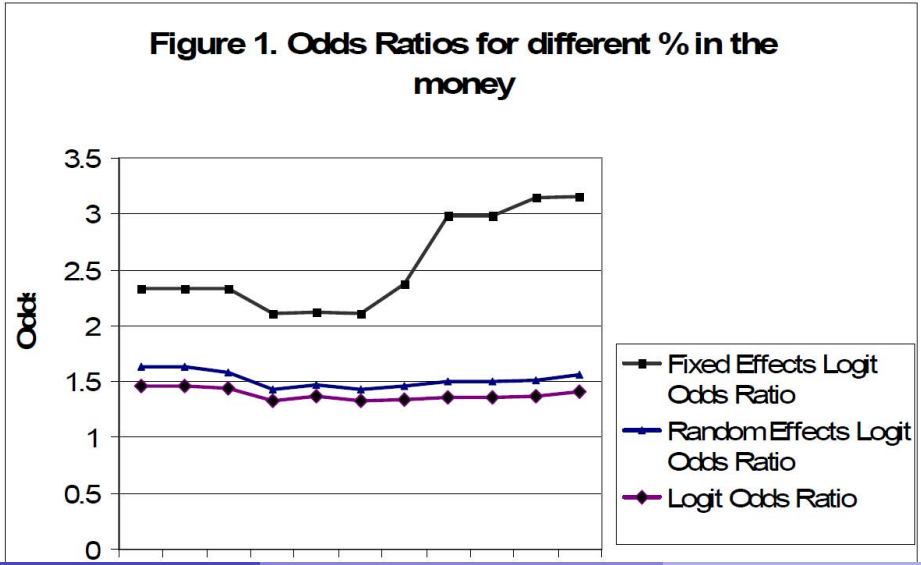


Figure 1. Odds Ratios for different % in the money
Odds
3.5
3
2.5
2
1.5
1
0.5
0
Fixed Effects Logit Odds Ratio
Random Effects Logit Odds Ratio
Logit Odds Ratio

Empirical Predictions

Rational CEO $\longrightarrow$ Overconfident CEO

1. On average?
2. Overconfident CEOs do more mergers that are likely to destroy value
3. Overconfident CEOs do more mergers when they have abundant internal resources
4. The announcement effect after overconfident CEOs make bids is lower than for rational CEOs

Diversifying Mergers

1. Diversification discount
   (*Lamont and Polk, 2002; Servaes, 1996; Berger and Ofek, 1995; Lang and Stulz, 1994*)
2. Market understands ex ante
   (*Morck, Shleifer and Vishny, 1990*)

Table 5: Diversifying Mergers

	Fixed-effects logit	Random-effects logit		
		Baseline	Cash rich	Cash poor
Panel 1. Diversifying mergers				
Longholder	2.5376	2.0108	2.5042	1.781
	(3.31)***	(3.29)***	(2.56)**	(2.27)**
Firm fixed effects	Yes	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes
Observations	1,832	3,540	1,227	2,313
Number of firms	159	322	282	314
Panel 2. Within-industry mergers				
Longholder	1.6646	1.2965	1.3161	1.1471
	(1.03)	(1.01)	(0.82)	(0.43)
Firm fixed effects	Yes	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes
Observations	1,467	3,540	1,227	2,313
Number of firms	127	322	282	314

z-Statistics in parentheses. Constant included.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

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Rational CEO $\longrightarrow$ Overconfident CEO

1. On average?
2. Overconfident CEOs do more mergers that are likely to destroy value
3. Overconfident CEOs do more mergers when they have abundant internal resources
4. The announcement effect after overconfident CEOs make bids is lower than for rational CEOs

Empirical Predictions

Rational CEO $\longrightarrow$ Overconfident CEO

1. On average?
2. Overconfident CEOs do more mergers that are likely to destroy value
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Empirical Specification

$$CAR_i = \beta_1 + \beta_2 O_i + X^T \gamma + \epsilon_i$$

where i: company, O: overconfidence, X: set of controls

$$CAR_i = \sum_{t=-1}^{1} (r_{it} - \mathbb{E}[r_{it}])$$

where $\mathbb{E}[r_{it}]$ is the daily S&P 500 return ($\alpha = 0, \beta = 1$)

Market Response

Panel A			
	Average CAR $[-1,+1]$		
	All bids	Cash bids	Stock bids
Full sample	−0.0029	0.0045	−0.0087
	(808; 1.73)*	(354; 1.82)*	(454; 3.94)***
Longholder = 0	−0.0012	0.0070	−0.0075
	(611; 0.62)	(265; 2.21)**	(346; 3.03)***
Longholder = 1	−0.0090	−0.0032	−0.0135
	(178; 2.73)***	(78; 0.88)	(100; 2.64)***

Number of observations and t-statistics in parentheses.

Do Outsiders Recognize CEO Overconfidence?

Portrayal in Business Press:

1. Articles in
   - New York Times
   - Business Week
   - Financial Times
   - The Economist
   - Wall Street Journal
2. Articles published in 1980-1994
3. Articles which characterize CEO as
   - Confident or optimistic
   - Not confident or not optimistic
   - Reliable, conservative, cautious, practical, steady or frugal

Measuring Press Portrayal

$$TOTALconfident = \begin{cases} 1 \text{ , if [“confident” + “optimistic”]} > \text{[“not confident” +} \\ \quad \text{“not optimistic” + “reliable, conservative, cautious} \\ \quad \text{practical, steady, frugal”]} \\ 0 \text{ , otherwise} \end{cases}$$

Independent of the effects of coverage frequency

Market Perception versus CEO beliefs

- *TOTALconfident* positively and statistically significantly correlated with Longholder
  - Farrell and Mark are *TOTALconfident*
  - Marriott and Crane are *not TOTALconfident*
- *TOTALconfident* CEOs (like *Longholders*) are more acquisitive on average
  - Especially through diversifying mergers
  - Especcially when they are financially unconstrained

$\Rightarrow$ Overconfidence — identified by CEO *or* market beliefs — leads to heightened acquisitiveness

Press Coverage and Diversifying Mergers

	All	Diversifying	Intra-industry
	(2)	(4)	(6)
TOTALconfident	2.5442	3.2492	1.6670
	(2.36)**	(2.35)**	(0.86)
"No past merger" state dummies	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	716	716	548

z-Statistics in parentheses. Constant excluded.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Summary of Findings

- Overconfident managers are more acquisitive.
- Much of the acquisitiveness is in the form of diversifying mergers.
- Overconfidence has largest impact if CEO has abundant internal resources.
- The market reacts more negatively to the mergers of overconfident CEOs.

Implications for Contract Design

Overconfidence vs. "empire-building" preferences:

- Immune to incentives
- Responds to capital structure (motivates "debt overhang")
- Requires board independence and vigilance

Back to the "Two Perspectives"

Perspective 1: Misvaluation of Investors

- "Investor sentiment"
- Managerial response: timing of mergers, in particular of stock-financed mergers

Perspective 2: Misvaluation of Managers

- "CEO overconfidence"
- Market response: limited willingness to finance overestimated mergers (hence sensitivity to available internal funds); negative stock price reaction to overestimated mergers

Who is right?

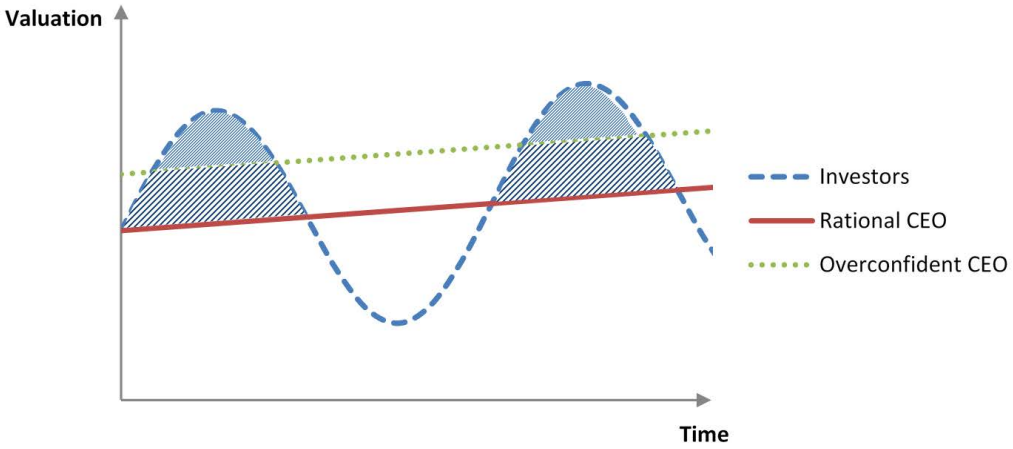
Biased Managers or Biased Investors?

- Who is biased? Which approach is right?

Not the right question

- Consider gym example — self-control problems of members and overconfidence of entrepreneurs
- Merger example: easily consistent

Illustration of Differences in Firm Valuation



Next Steps

Question: What about managers other than the CEO?

- CFO, COO etc. (C-Suite); any level with data availability
- Cf. Malmendier, Pezone, Zheng (*forthcoming*), Managerial Duties and Managerial Biases

Question: What about interactions of these biases? What if biases of managers and of investors are correlated?

- Generates exacerbated booms and busts in many settings
- Can we get more distinctive predictions?

Example

- CEO overconfidence appears to be pro-cyclical
  - Measure: under-diversified CEOs invest even more in their company (do not exercise options that are highly in the money, buy additional stock)
  - Number of CEOs who are "identifiable" as overconfident increases in good times
  - But also: Percentage of overconfident CEOs increases in good times
- Investor sentiment appears to be pro-cyclical (investors more optimistic in good times, pessimistic in bad times)

Example

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- Investor sentiment appears to be pro-cyclical (investors more optimistic in good times, pessimistic in bad times)
- **Does one set of biases fuel the other set of biases?**

All of this in more detail

- **Behavioral Corporate Finance**. In: D. Bernheim, S. DellaVigna, and D. Laibson (eds.), Handbook of Behavioral Economics, Volume 1, Elsevier, October 2018.
- **Behavioral Corporate Finance: Life Cycle of a CEO Career** (with Marius Guenzel), In: Oxford Research Encyclopedia of Economics and Finance, Oxford University Press, September 2020.

Back to "Why Behavioral CF?"

- We saw "market interaction" and a bit of "saving the world" in the sens of revealing (i) biases of managers, (ii) manager exploiting biases in investors can be helpful because of their outsize influence.
- Now more on "laboratory" / convenience sample.