THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

FINM3407 – Behavioral Finance

Topic 5:

Chapters 16: Application of Managerial Overconfidence

Reference: Ackert and Deaves, Chapters 6 & 9

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What we do this week

[Application of Managerial Overconfidence]

- Brief Introduction: Application of Managerial Overconfidence
- Capital Budgeting:
  - Payback and Ease of Processing,
  - Allowing Sunk Costs to Influence the Abandonment Decision,
  - Allowing Affecting to Influence Choices
- Managerial Overconfidence
- Investment and Overconfidence
- Can Managerial Overconfidence have a Positive Side?

Capital budgeting: **a process that businesses use to evaluate potential major projects or investments**

Capital budgeting errors:

1. **Ease of processing…**

May lead to inappropriate adoption rules

2. **Loss aversion…**

May lead to problems with abandonment

3. **Affect…**

May cause managers to avoid profitable investments

Specifically, we consider

1) the still wide-spread use of (patently inferior) payback as a project selection technique,
2) the tendency to throw good money after bad (sunk costs),
3) and the proclivity to allow irrelevant information to influence project adoption.

Capital budgeting and ease of processing

- Conventional finance theory demonstrates that, when properly applied, **NPV is optimal decision rule for capital budgeting purposes.**

- Yet **a number of surveys show that managers often utilise less than ideal techniques**, such as the internal rate of return (IRR) and, even worse, payback period (e.g. Graham & Harvey, 2005).

Latter two may be easier to process and more salient. For this reason, they may be compelling.

- ❑ The desirability of **getting your money back quickly** (as reflected in payback) is obvious to even the most unsophisticated observer, though many do not realise that any payback benchmark can only be arbitrary.
- ❑ **Somewhat less intuitive is IRR, but a comparison between the project's estimated return and its cost of capital is still quite compelling.**
- ❑ **NPV, which is all about value creation, is perhaps a harder concept to grasp.** So, it is possible that psychology is playing a role in the sometimes-weak capital budgeting technique choices that are made.

Allowing Sunk Costs to Influence the Abandonment Decision

Capital budgeting and loss aversion

- **Mental accounting suggests that if an account can be kept open in the hope of eventually turning things around this will often be done.**

Say prior investment has not gone well.

- **Proper capital budgeting practice is to periodically assess the viability of all current investments, even proceeding with their abandonment when this is a value-enhancing course of action.**

- **Problem with abandonment however is that it forces recognition of an *ex-post* mistake.**

Because of loss aversion, it may happen that managers foolishly hang on, throwing good money after bad.

Allowing Sunk Costs to Influence the Abandonment Decision

Capital budgeting and loss aversion - Example

- The market seems to sense the problem.
- One study indicates that announcements of project terminations are usually well received.
- Well-known example: Lockheed and its **L-1011 airplane project** (which the government ended up bailing out) . When the firm eventually announced abandonment, the market **pushed up its stock price by 18%.**

- High personal responsibility in the original investment decision **increases** the resistance to project abandonment. **This seems to be due to the greater regret that would be induced by "admitting defeat,"** as compared to the feeling of cutting losses and getting back on track that a new manager without the same level of emotional commitment to the project would feel.
- **A takeover can facilitate such fresh thinking**.

Allowing Affect to Influence Choices

Is it possible that emotion impacts capital budgeting decisions?

Since emotion plays a role in so many other realms, financial and otherwise, it would not be surprising to see it wield influence here. **Direct evidence is likely to be anecdotal at best, since it is not clear how to calibrate a manager's emotional state.**

Academic Example

Kida, Moreno, and Smith (2001) surveyed a total of 114 managers (or individuals with similar responsibilities).

- Presented with one of five treatments where they had to make a choice between two internal investment opportunities.

- In four of the treatments the choice was between **one alternative with a higher NPV and a description inducing negative affect**, and **a second alternative with a lower NPV but a neutral description**.

Capital Budgeting and Affect to Influence Choices - Example

For example, in scenario 1, participants were told that they were divisional managers deciding between two product investments, each of which would require working with a different sister division run by two different managers.

- **One of the managers** in question was characterised as being arrogant. Financial info of the project, if done with this individual, would generate a set of cashflows leading to a higher NPV than the other project.
- The other three negative affect scenarios were similar in their attempt to elicit a negative mood or emotion.
- **The final treatment had neutral descriptions attached to both investment projects.**
- While in the control group the majority of subjects chose the higher-yielding project, in all four negative treatments the opposite happened: situations associated with negative affect were avoided to the point of accepting value destruction.

TABLE 16.1 | CAPITAL BUDGETING CHOICES IN AN EXPERIMENTAL CONTEXT

Experimental scenarios	Negative affect choice	Neutral alternative
Scenario 1		
Number	6	21
Percentage	22.2%	77.8%
Scenario 2		
Number	2	15
Percentage	11.8%	88.2%
Scenario 3		
Number	6	28
Percentage	17.6%	82.4%
Scenario 4		
Number	3	12
Percentage	20.0%	80.0%
Control group		
Number	16	5
Percentage	76.2%	23.8%

Source: Kida, T. E., K. K. Moreno, and J. F. Smith, 2001, "The influence of affect on managers' capital-budgeting decisions," *Contemporary Accounting Research* Volume 18 Issue (3), 477–494. © The Canadian Academic Accounting Association.

Managerial Overconfidence

- It would be surprising if managers of corporations were markedly different from the **rest of the population in terms of their overconfidence.** Indeed, there is abundant evidence that managers, like investors, are egregiously overconfident.

Ben-David, Graham, and Harvey (2007) found that managers tended to predict stronger performance for their operations than actually occurred. Excessive optimism in project cost forecasts is endemic. When CFOs predict market movements, ***only 40% of realisations fall within 80% confidence intervals****.*

- The process of CEO selection and monitoring also likely **rewards and encourages overconfidence.**

There are two forces here. ***First, generous executive compensation (often only weakly related to firm performance) signals success. Greater overconfidence can result because of associated self-attribution bias. Second, the tendency for boards to be overly deferential and for investors to employ the "Wall Street rule" (sell if unhappy with management) also plays to managerial overconfidence.***

- Various managerial behaviours have been **attributed to overconfidence.**

For example, research indicates that overconfident managers ***tend to miss earnings targets in voluntary forecasts****, and, as a result, display a greater proclivity to manage earnings.*

Managerial Overconfidence:
Tendencies of overconfident managers

(1) Overinvestment.

(2) Sensitivity of investment to cashflows is higher

(3) More active in acquiring other companies.

(4) Too quick to start a new business.

Managerial Overconfidence: Overinvestment

- Ben-David, Graham, and Harvey utilised an extensive quarterly survey of CFOs over a six-year period, which, among other things, **asked for 90% confidence intervals for 1-year-ahead and 10-year-ahead market returns, as well as respondents' optimism levels for the economy and prospects for their own companies.**

- The advantage of this survey is that it elicited two separate overconfidence metrics: one based on miscalibration (which they call overconfidence) and the other based on excessive optimism.
  - (e.g., These researchers then acquired data on the companies for which these CFOs were employed so as to be able to correlate overconfidence metrics with firm-level behaviour.)

- **It was possible to conclude that overconfident managers invest more.** (In the next section, evidence is presented that the investment strategy of overconfident managers can be suboptimal.)

Overconfidence measure – Malmendier and Tate

- CEOs often receive stock and option grants as compensation.
- Overconfident managers are *happy to expose* themselves to *own-firm-specific risk* even when diversification gains are available.
- Overconfidence managers are measured as the tendency to voluntarily hold *a large number of in-the-money-options*.
  - Optimally from the standpoint of diversification gains should be exercised, but that are still being held.

Managerial Overconfidence: Sensitivity of investment to cashflows is higher

Two traditional explanations for such investment distortions have been put forth.

1. **Free cash flow problem:** It has been suggested that the potential misalignment of managerial and shareholder interests induces overinvestment when free cash is available, as managers are keen to empire build and provide themselves perks.

2. **An asymmetric information** view purports that the firm's managers, acting in the best interests of shareholders and noticing that the company's shares are undervalued, will not issue new shares to undertake investment projects.

In both cases, investment and cash flows will be positively correlated

Managerial Overconfidence: Sensitivity of investment to cashflows is higher

The empirical results turned out to be consistent with the predictions of these researchers.

Firm-level investment is regressed on the following:

(1) cash flows;
(2) market value of the assets over the book value of the assets, or Tobin's Q (*which is a standard performance measure*);
(3) overconfidence (***as proxied by the tendency to hold options longer than optimal***);
(4) interaction of the OC and cash flows.

TABLE 16.2 | REGRESSIONS OF INVESTMENT ON CASH FLOWS AND OVERCONFIDENCE

	Coefficient estimates and t-statistics	
Independent variable	Regression (1)	Regression (2)
Cash flows	0.6419 (7.19)	0.6729 (7.56)
Q	0.0635 (6.54)	0.0656 (6.79)
Overconfidence	—	-0.0351 (1.35)
Overconfidence * cash flows	—	0.1648 (3.39)
R^2	0.56	0.56

Source: Malmendier, U., and G. Tate, 2005, "CEO overconfidence and corporate investment," *Journal of Finance* 60, 2661–2700. © Wiley Publishing, Inc. This material is used by permission of john Wiley & Sons, Inc.

- The first displayed regression excludes the overconfidence variable and its interactive term. As previous work has indicated, investment **increases** with cash flows and Tobin's Q.
- The second regression incorporates overconfidence and the interaction of overconfidence and cash flows.
- The coefficient on cash flows provides the sensitivity of investment to cash flows, and the latter plus the coefficient on the interactive term provides the comparable sensitivity for overconfident managers.

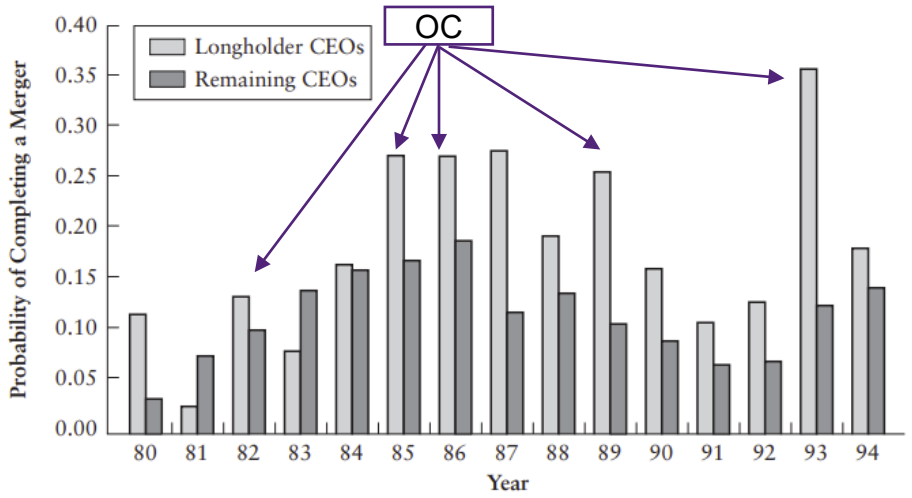
Since the coefficient on the interactive term that the sensitivity of investment to cash flows is **higher** for overconfident managers. This is consistent with the hypothesis that overconfident managers, despite what theory suggests, are more influenced by cash flows than less overconfident managers.

Managerial Overconfidence: Mergers and Acquisitions

- General M&A outcome: Acquiring firms don't seem to benefit their shareholders overall. During the period 1980-2001, $220 billion was lost immediately after bid announcements.
- Survey evidence documents that overconfident managers appear to be more active on the M&A front.
- Malmendier and Tate investigate whether naturally occurring data (as opposed to survey data) support this idea, and, if so, whether this increased M&A activity leads to success for the companies.
- **The impact of overconfidence on merger activity is not obvious or simple, because there are two conflicting motivations at play:**
  - First motivation (encourage mergers), **OC managers tend to overestimate the potential synergies and their ability to handle problems that may arise.** This makes them more likely to attempt M&A.
  - Second motivation (discourage mergers), **OC managers often believe their firms are undervalued, if a merger requires external financing**, they might be reluctant to do so.

Managerial Overconfidence: Mergers and Acquisitions

FIGURE 16.1 Merger Activity by Overconfident and Other Managers



- **Except for two years of their sample, all overconfident managers engage in more M&A activity.**
- Consistent with their previous study, **the impact of overconfidence is greater for firms with abundant internal resources.**

- The market has a sense of the value destruction wrought by overconfident managers. While the typical market response to an announcement of a merger attempt engineered by a less overconfident manager is **a drop of 12 basis points**, managers subject to **an inflated sense of their ability witness a (much larger) 90- basis point drop**.
- Various alternative explanations for these findings are considered. The same behaviour could result from **greater risk-seeking or agency (empire-building) considerations.**
- The authors, however, argue that the **first is difficult to reconcile with an observed preference for cash acquisitions**; and the second is not easy to tally with CEOs' personal overinvestment.

Managerial mistake stemming from overconfidence: Excess entry

Businesses, especially small ones, fail at an alarmingly high rate.

One possible reason for this is overconfidence.

- Excessive optimism: overestimation of market demand.
- Better-than-average effect: “I will beat the odds.”

- Measuring overconfidence typically requires proxies based on track records or visibility, which many entrepreneurs lack. While industry data often suggests excessive market entry, potentially indicating overconfidence, it's challenging to compare the characteristics of entrepreneurs who enter versus those who don’t.
- So, field tests (research conducted in a real-world setting) are problematic → need an experimental setting (allows us to identify and separate key influential elements)
- **Camerer & Lovallo (1999) performed an experiment, where subjects had to choose, over multiple rounds (periods), whether or not to enter markets.**

Excess entry: Experimental evidence

- Experiment setting:
  - An appearance fee was received by all participants. **Suppose this value is $10.**
    - **In the event of non-entry into the market, participants keep the fee.**
    - **Entry, on the other hand, risks losing some of (or all of) this fee.**
    - At the same time, a positive profit is possible as a result of entry.

- **Profit function was specified as:**

$$\textit{Profit} = [10 / (N - c)] * (c - E)$$

Where:

- *N = no. of players choosing whether or not to enter a market in a given round*
- *c = market capacity*
- *E = number of actual entrants*

Typically, what happened was that E was close to c, implying familiar zero-profit condition of microeconomics.
In other words, **no excess entry**

Excess entry: Experimental evidence

Profit = [10 / (N - c)] * (c – E)

If assume c = 8 & N = 16 ⟹ Profit = [10/(16-8)]*(8-E)

And if E = 4; Profit = Industry profit:

And if E = 12; Profit = Industry profit:

And if E = 8; Profit = Industry profit:

Excess entry: Experimental evidence cont.

Recalled: Profit = [10 / (N - c)] * (c – E)

Researchers incorporated overconfidence as follows:

- **1) Payoffs depended on subjects' ranks (r) in following fashion:**

  a) the first c entrants in rank received:

  Profit = $50 * [(c + 1 –r) / (1 + 2 +...+c)]

  b) all entrants with r < c received:

  Profit = -$10

For example, given c = 3 and E = 12, we have:

r = 1: Profit = $25;

r = 2: Profit = $17;

r = 3: Profit = $8;

r = 4, 5… 12: Profit = -$10

Note that if, as here, ***E > c+5,*** industry profit is **negative.**

Excess entry: Experimental evidence cont. ii.

2) Subjects' ranks depended on either a random device or skill, where skill was assessed after completion of experiment using **either brain teasers or trivia quizzes** (involving current events and sports).

3) Subjects in some experiments (but not all) were told **in advance that the experiment depended on skill.**

4) Subjects **forecast the number of entrants in each period**.

5) Entry decisions were made **in two rounds of 12 periods each**, with ranking being skill-based in one round and random in the other.

6) **Market capacity** was as follows: **c = 2, 4, 6, and 8.**

Experimental evidence – Key Issue

Are players more likely to enter when one's profit is determined by perceived skill?

If people have true picture of their skill relative to the skill of others, there should be no impact:

- While those more skillful (and in knowledge of this) would be more likely to enter…
- Those less skillful (and in knowledge of this) would be less likely to enter…
- So, on balance these tendencies should cancel out

Experimental results

Table 16.3: Average Industry Profit by Round and Condition

	Round												
Rank condition	1	2	3	4	5	6	7	8	9	10	11	12	Avg
Regular instructions													
Random	15	25	15	27.5	12.5	12.5	17.5	27.5	17.5	22.5	20	25	19.79
Skill	15	2.5	15	17.5	7.5	0	17.5	5	10	12.5	10	15	10.83
Self-selection instructions													
Random	20	15	15	15	12.5	17.5	7.5	20	7.5	10	7.5	20	13.96
Skill	-12.5	-20	-15	-12.5	-22.5	-17.5	-25	-5	-17.5	-2.5	-12.5	-5	-13.96

Interpretation

Looking at the average column (far right)

- When regular instructions were used, random vs. skilled differential profit was 8.96 (19.79 – 10.83).
  - Suggesting additional entry when the payoff was to be determined by skill
- Differential was even greater when self-selection instructions were used [27.92 (13.96 – (-13.96)].
  - Consistent with reference group neglect effect

Can Managerial Overconfidence have a Positive Side?

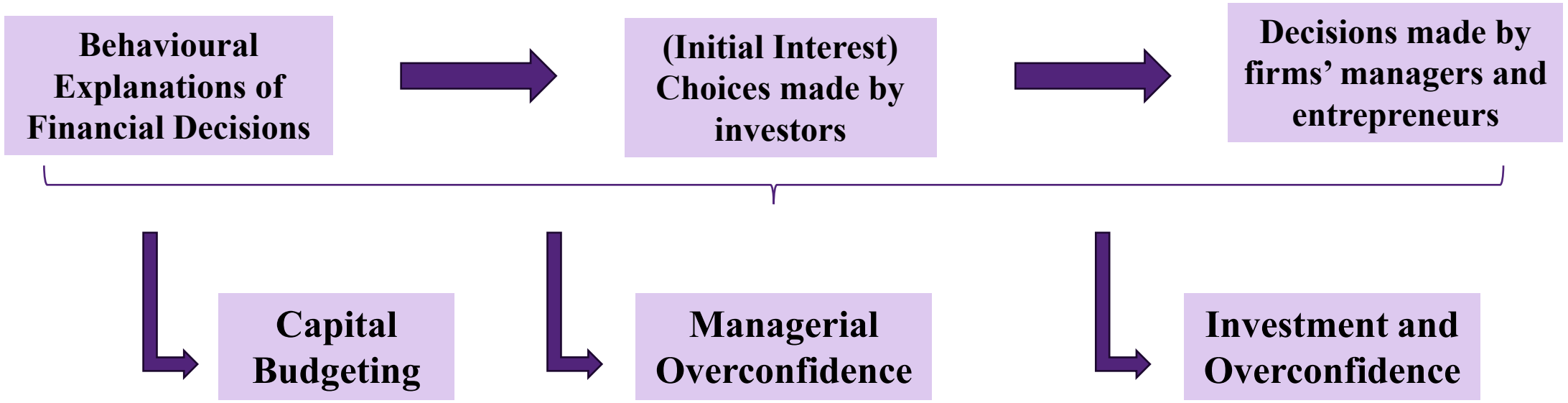
- Aside from obvious potential impacts on investment, capital structure may also be affected. Hackbarth (2007) has formulated a model where otherwise rational managers are not only excessively optimistic about their firm's prospects, but also overly sure about their views.

  →This model suggests that **managerial overconfidence is positively correlated with debt issuance, because optimism about future cash flows leads to a belief that there will be little problem in covering interest payments**.

  →Ironically, the natural tendency to shy away from debt because of job concerns (which is value-destroying because the benefits of debt are not exhausted) is counteracted by overconfidence.

- It has even been suggested that overconfidence among entrepreneurs, even if personally deleterious, might be socially beneficial, because entrepreneurial activity can provide valuable information to society (unlike herders, who provide no information). In this sense, it serves **a valuable evolutionary purpose**.

Mind Map: Application of Managerial Overconfidence



- Payback and Ease of Processing
- Allowing Sunk Costs to Influence the Abandonment Decision
- Allowing Affect to Influence Choices

- After citing some evidence that managers are no different from the rest of the population in terms of their overconfidence, we turn to the consequences.
- Much research has been devoted to the impact of overconfidence on various forms of investment.

- Overinvestment
- Investment Sensitivity to Cash Flows
- Mergers and Acquisitions
- Start-ups

Conclusion

1. Because of ease of processing, inappropriate capital budgeting techniques may be favored. Because of loss aversion, managers may throw good money after bad. And because of affect, emotion sometimes gets in the way of optimal managerial decision-making.

2. There are many markers (measures) of managerial overconfidence. One is the tendency to hold on to in-the-money options too long.

3. Managerial overconfidence likely leads to various forms of investment distortions or overinvestment.

4. Aside from too much capital spending, overinvestment manifests itself in tendencies toward excessive M&A activity and to be too quick to undertake start-ups.

5. An example of an investment distortion is allowing the availability of internal funds to dictate whether investment should go ahead.

6. Overconfidence may have a bright side, though, in particular because it "corrects" excessive managerial risk aversion.

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Topic 5:

Thank you very much

[Part Two – Paper Presentation]

Huang, R., Tan, K. J. K., & Faff, R. W. (2016). CEO overconfidence and corporate debt maturity. Journal of Corporate Finance, 36, 93-110.

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CEO Overconfidence and Corporate Debt Maturity

Ronghong Huang

Kelvin Tan

Robert Faff

Research Question

- What are the impacts of overconfident CEOs on corporate debt maturity structure?
- What is the channel through which they manage debt maturity structure?
- What is the role of liquidity risk?
- What are the impacts on financing costs?

Main Results

- Overconfident CEOs have **higher proportion** of debt due within one, two and three years
- Overconfident CEOs shorten debt maturity by taking on **higher proportion** of short-term debts (less than 12-month maturity)
- Overconfident CEOs are **not deterred** by existing liquidity risks
- Overconfident CEOs have LOWER syndicated loan costs

Overconfidence Overview

Psychology		Behavioural Corporate Finance	
Overconfidence (Moore and Healy, 2008)	**Overestimation**	Overestimation of **Mean**	**Overconfidence** (e.g., Malmendier and Tate, 2005)
	Overplacement		**Optimism** (e.g., Heaton, 2002)
	Overprecision	Underestimation of **Variance**	**Overconfidence** (e.g., Goel and Thakor, 2008)
			Miscalibration (e.g., Ben-David, Graham and Harvey, 2013)

Literature Review

Behavioral Corporate Finance Literature primarily focus on Overestimation of Mean Overconfidence on Corporate Policies

- Investment Decision (Malmentier & Tate, 2005)
- Innovation (Hirshlefer and Teoh, 2012)
- M&A Activity (Malmentier & Tate, 2008)
- Debt vs. Equity (Malmentier, Tate & Yan, 2011)
- Dividend (Deshmukh, Goel & Howe, 2013)

Literature Review

- **Traditional Debt Maturity Theory**
  - Debt-Equity Conflict (Myers, 1977)
  - Information Asymmetry (Flannery, 1986)
  - Liquidity Risk (Diamond, 1991)
  - Corporate Tax (Brick and Ravid, 1985)
- **More recently, Owner-Manager Conflicts**
  - CEO Stock Ownership (Datta et al., 2005)
  - CEO Option Holdings (Brockman et al., 2010)
- **However, CEO Rationality is Maintained**

Hypothesis

- **Basic Intuition**
  - Overconfident CEOs overestimate future firm performance
  - Overconfident CEOs misbelieve they have private information
  - All debt securities are mispriced, more for long-term debt
  - Borrow short-term debt, and refinance when positive news arrives

- **Hypothesis**: Overconfident CEOs prefer Shorter Debt Maturity Structure

Empirical Approach

- **Data Source**: CRSP, Compustat and Execucomp
- **Sample**
  - 2006 to 2012
  - 4,309 firm-year observations, 944 firms
- **Model Specification**
  - $$Debt\ Maturity = \alpha_0 + \alpha_1 Longholder + X'\beta + \varepsilon \qquad (1)$$
- **Control variables follow Brockman et al. (2010), Datta et al. (2005), and Johnson (2003)**
- **Control for joint determination of debt maturity and leverage (Barclay et al., 2003; Johnson, 2003)**
  - Use IV-GMM regression

Debt Maturity Measures

Table B2

Relations between alternative debt maturity proxies (dependent variables).

This table summarizes the relations between different debt maturities proxies used for our dependent variables. NP represents the amount of short-term borrowing (debt with less than 12-month maturity). DD1, DD2, DD3, DD4, DD5 and DD5+ represent the amount of long-term debt due in 1st, 2nd, 3rd, 4th, 5th and after 5th year. ST1 to ST5 are the ratios of respective proportion of debt maturing within one to five years (including ST) to total debt. LT1 to LT5 are the ratios of respective proportion of long-term debt maturing within one to five years (excluding ST) to total debt. A numerical example is also given in the table, and we assume the value of the total debt is 100. Values of respective debt components and calculation of debt maturity proxies are in parentheses.

	Compustat Item Names (except for DD5+)						
Debt Maturity Proxy	**NP (8)**	**DD1 (10)**	**DD2 (12)**	**DD3 (14)**	**DD4 (16)**	**DD5 (18)**	**DD5+ (22)**
$(\frac{8}{100}+\frac{10}{100})$ ST1 =	ST $(\frac{8}{100})$ +	LT1 $(\frac{10}{100})$					
$(\frac{8}{100}+\frac{10+12}{100})$ ST2 =	ST $(\frac{8}{100})$ +	LT2 $(\frac{10+12}{100})$					
$(\frac{8}{100}+\frac{10+12+14}{100})$ ST3 =	ST $(\frac{8}{100})$ +	LT3 $(\frac{10+12+14}{100})$					
$(\frac{8}{100}+\frac{10+12+14+16}{100})$ ST4 =	ST $(\frac{8}{100})$ +	LT4 $(\frac{10+12+14+16}{100})$					
$(\frac{8}{100}+\frac{10+12+14+16+18}{100})$ ST5 =	ST $(\frac{8}{100})$ +	LT5 $(\frac{10+12+14+16+18}{100})$					

Use in Table 3

Use in Table 4

Overconfidence Measure

- **<u>Revealed belief from option exercise behaviour</u>**
  - Executive options are non-tradeable and not allowed to hedge
  - CEOs are highly exposed to firm-specific risk
  - Trade-off between option value and risk exposure
  - Should exercise early if sufficiently in-the-money

- ***Longholder*:** Take the value of unity if CEO ever holds an option until last year of duration and the option is at least 40% (Malmendier and Tate, 2005 & 2008)
  - 40% cut-off is based on Hall and Murphy (2002)
  - Any cut-off between 0% to 100% yields qualitatively similar results

Table 1 Panel A Descriptive Statistics

Table 1
Firm characteristics summary statistics.
This table shows the summary statistics for our dependent variables and firm-level control variables. Panel A summarizes the entire sample while Panel B further partitions the sample into overconfident CEO and non-overconfident CEO subsamples. A CEO is deemed overconfident if he/she ever held an option to the final year of duration and the option is at least 40% in-the-money entering its last year. *ST1*, *ST2*, *ST3*, *ST4* and *ST5* are five alternative measures of debt maturity. Details of all variable measurements are provided in Appendix B. t-tests are conducted to test for differences between the means for the overconfident and non-overconfident subsamples.

Panel A: pooled sample (N = 3291 observations)

	Mean	Std. dev.	Min.	Median	Max.
ST1	0.174	0.256	0.000	0.072	1.000
ST2	0.266	0.293	0.000	0.170	1.000
ST3	0.369	0.319	0.000	0.284	1.000
ST4	0.479	0.330	0.000	0.418	1.000
ST5	0.594	0.320	0.000	0.566	1.000
Leverage	0.157	0.121	0.000	0.136	0.543
Firm size ($m)	15,609.2	32,102.0	156.5	4369.6	222,249.0
Asset maturity	11.128	10.072	0.607	7.535	44.175
Earnings volatility	0.036	0.036	0.003	0.025	0.207
Abnormal earnings	0.012	0.168	−0.583	0.005	1.037
Market-to-book ratio	1.689	0.795	0.740	1.446	5.110
Term structure	1.781	1.270	−0.640	1.830	3.650
Rating dummy	0.637	0.481	0.000	1.000	1.000
Z-score dummy	0.864	0.343	0.000	1.000	1.000

Table 1 Panel B Descriptive Statistics

Panel B: overconfident versus non-overconfident subsamples

	Non-overconfident CEOs (927 CEOs)			Overconfident CEOs (371 CEOs)		
Variables	N Mean	Median	Std. Dev.	N Mean	Median	Std. Dev.
ST1	0.164	0.067	0.246	0.195***	0.086	0.273
ST2	0.254	0.161	0.286	0.293***	0.193	0.306
ST3	0.354	0.269	0.314	0.400***	0.321	0.329
ST4	0.466	0.400	0.328	0.508***	0.461	0.332
ST5	0.580	0.542	0.322	0.622***	0.609	0.314
Leverage	0.162	0.141	0.120	0.147***	0.124	0.122
Size ($m)	15,847.7	4468.2	34,081.5	17,964.2	4130.7	49,599.9
Asset maturity	11.812	8.166	10.549	9.649***	6.342	8.777
Earnings volatility	0.036	0.025	0.034	0.037	0.024	0.038
Abnormal earnings	0.014	0.005	0.179	0.009	0.004	0.141
Market-to-book ratio	1.646	1.399	0.764	1.781***	1.551	0.852
Term structure	1.753	1.830	1.280	1.842**	1.860	1.246
Rating dummy	0.662	1.000	0.473	0.583***	1.000	0.493
Z-Score dummy	0.846	1.000	0.361	0.903***	1.000	0.296

* Indicates significance at the 10% level.
** Indicates significance at the 5% level.
*** Indicates significance at the 1% level.

Table 2 Panel A CEO Characteristics Summary Statistics

Table 2
CEO characteristics summary statistics.
This table shows the summary statistics for the CEO-level variables. Panel A summarizes the entire sample, while Panel B further partitions the sample into overconfident CEO and CEO non-overconfident subsamples. *Longholder* is the proxy for CEO overconfidence. Longholder is a dummy variable taking a value of one if the CEO ever held an option to the final year of duration and the option is at least 40% in-the-money entering its last year. *Male* is a dummy variable taking a value of one if the CEO is male, and zero otherwise. *Age* is the age of CEO. *Option Ownership* is CEO's exercisable option ownership which is defined as number of exercisable options divided by common shares outstanding. *Tenure* is CEO's tenure. *Total Compensation* is CEO's total compensation during the year, as defined in Compustat (item TDC1). Details of the measurements of all other variables are given in Appendix B. t-tests are conducted to test for univariate differences between the means for the overconfident and non-overconfident subsamples.

Panel A: pooled sample

	N	Mean	Std. dev.	Min.	50%	Max.
Longholder	4309	0.316	0.465	0.000	0.000	1.000
Male	4309	0.970	0.172	0.000	1.000	1.000
Age	4273	55.908	6.366	29.000	56.000	85.000
Tenure	4228	7.350	6.568	0.005	5.655	50.118
Delta ($,000) price sensitivity	4309	577.463	1185.761	5.038	221.959	9078.523
Vega ($,000) volatility sensitivity	4309	171.761	237.175	0.158	78.455	1249.419
Stock ownership	4309	0.011	0.029	0.000	0.003	0.197
Option ownership	4309	0.007	0.008	0.000	0.004	0.048
Total compensation ($,000)	4298	5985.912	5318.663	459.922	4400.208	27,328.320

Table 2 Panel B CEO Characteristics Summary Statistics

Panel B: overconfident versus non-overconfident CEOs

	Non-overconfident CEOs (927 CEOs)				Overconfident CEOs (371 CEOs)			
	N	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.
Male	2946	0.966	1.000	0.180	1363	0.977*	1.000	0.151
Age	2917	55.712	56.000	6.098	1356	56.328***	56.000	6.890
Tenure	2888	6.358	5.000	5.558	1340	9.489***	7.500	7.930
Delta ($,000)	2946	448.555	180.330	957.133	1363	856.086***	345.214	1533.877
Vega ($,000)	2946	159.075	71.096	222.474	1363	199.179***	100.448	264.206
Stock ownership	2946	0.009	0.002	0.024	1363	0.017***	0.004	0.036
Option ownership	2946	0.006	0.003	0.007	1363	0.010***	0.007	0.010
Total compensation ($,000)	2940	5871.646	4376.426	5172.981	1358	6233.291**	4462.999	5615.141

* Indicates significance at the 10% level.
** Indicates significance at the 5% level.
*** Indicates significance at the 1% level.

Table 3: Relation between Debt Maturity and CEO Overconfidence

Table 3
Relation between debt maturity and CEO overconfidence.
This table presents the regression results from IV-GMM regression (second-stage equation presented only). The models estimated are discussed in Section 3.3. The sample contains 4309 observations and covers 2006 to 2012. The dependent variables of short-term debt are proxied by *ST1*, *ST2*, *ST3*, *ST4* and *ST5*, respectively. *Longholder*, our CEO overconfidence proxy, is a dummy variable taking a value of one if the CEO ever held an option to the final year of duration and the option is at least 40% in-the-money entering its last year. All variables are measured at fiscal year-end and details of their measurement are presented in Appendix B. Industry effects are based on the Fama-French 12 Industry Groups. Standard errors are clustered at firm level. The p-value is reported in parentheses.

Independent variables	Predicted sign	Dependent variable proxies — proportion of short-term debt				
		ST1	ST2	ST3	ST4	ST5
Longholder	+	0.036***	0.040***	0.037**	0.016	0.004
		(0.006)	(0.005)	(0.023)	(0.377)	(0.843)
Log(1 + delta)	−	−0.040***	−0.040***	−0.038***	−0.021	0.003
		(0.000)	(0.000)	(0.001)	(0.118)	(0.857)
Log(1 + vega)	+	0.012***	0.014***	0.013**	0.008	−0.001
		(0.006)	(0.003)	(0.024)	(0.248)	(0.880)
Stock ownership	+	1.261***	1.228***	1.231***	0.963**	0.312
		(0.000)	(0.000)	(0.000)	(0.012)	(0.457)
Leverage	−	−0.891*	−0.771	0.030	0.988	1.696
		(0.062)	(0.168)	(0.966)	(0.258)	(0.103)
Log(Firm Size)	−	−0.077	−0.164**	−0.232***	−0.288***	−0.311***
		(0.221)	(0.019)	(0.005)	(0.004)	(0.007)
$(\text{Log(Firm Size)})^2$	+	0.005	0.009**	0.013***	0.016***	0.017**
		(0.204)	(0.021)	(0.005)	(0.004)	(0.011)
Asset maturity	−	−0.002**	−0.002***	−0.004***	−0.005***	−0.005***
		(0.025)	(0.003)	(0.000)	(0.000)	(0.000)
Earnings volatility	+/−	0.006	0.066	0.071	0.188	0.273
		(0.978)	(0.763)	(0.771)	(0.492)	(0.369)
Abnormal earnings	+	0.030	0.006	−0.000	−0.011	-0.008
		(0.133)	(0.813)	(1.000)	(0.744)	(0.830)
Market-to-Book ratio	+	0.008	0.016	0.052*	0.084**	0.110**
		(0.731)	(0.545)	(0.087)	(0.023)	(0.011)
Term structure	−	−0.025**	−0.025*	−0.004	−0.012	−0.005
		(0.036)	(0.080)	(0.783)	(0.522)	(0.819)
Rating dummy	−	−0.047	−0.081**	−0.151***	−0.207***	−0.241***
		(0.105)	(0.015)	(0.000)	(0.000)	(0.000)
Z-score dummy	−	−0.079	−0.071	0.040	0.182	0.271*
		(0.271)	(0.398)	(0.703)	(0.167)	(0.084)
Year fixed effect		Yes	Yes	Yes	Yes	Yes
Industry fixed effect		Yes	Yes	Yes	Yes	Yes
Observations		4309	4309	4309	4309	4309
$R^2_{adjusted}$		0.244	0.232	0.135	−0.047[a]	−0.236[a]

*** Indicates significance at the 1% level.
** Indicates significance at the 5% level.
* Indicates significance at the 10% level.
[a] In IV regression, $R^2_{adjusted}$ is no longer bounded in the range 0 and 1.

Table 4: Short-term Debt and CEO Overconfidence

Table 4

Short-term debt and CEO overconfidence.

This table presents the regression results from IV-GMM regression (second-stage equation presented only). The models estimated are discussed in Section 3.3. The sample contains 4309 observations and covers 2006 to 2012. The dependent variables of short-term debt are proxied by *ST*, *LT1*, *LT2*, *LT3*, *LT4* and *LT5*, respectively. ST is very short-term debt (debt with less than 12-month maturity) divided by total debt (the sum of debt in the form of current liabilities and long term debt). LT1 to LT5 are the ratios of respective proportion of long-term debt mature within one to five years (excluding ST) to total debt. *Longholder*, our CEO overconfidence proxy, is a dummy variable taking a value of one if the CEO ever held an option to the final year of duration and the option is at least 40% in-the-money entering its last year. All variables are measured at fiscal year-end and details of their measurement are presented in Appendix B. Industry effects are based on the Fama-French 12 Industry Groups. Standard errors are clustered at firm level. The p-value is reported in parentheses.

Independent variables	Predicted sign	Dependent variables proxies — proportion of short-term debt					
		ST	LT1	LT2	LT3	LT4	LT5
Longholder	+	0.025**	0.010	0.015	0.012	−0.008	−0.021
		(0.033)	(0.246)	(0.197)	(0.397)	(0.644)	(0.319)
Log(1 + delta)	−	−0.029***	−0.010*	−0.010	−0.008	0.010	0.034**
		(0.000)	(0.085)	(0.179)	(0.391)	(0.405)	(0.023)
Log(1 + vega)	+	0.007**	0.004	0.006	0.005	−0.001	−0.010
		(0.043)	(0.160)	(0.102)	(0.352)	(0.901)	(0.210)
Stock ownership	+	0.608***	0.520**	0.519*	0.554*	0.262	−0.399
		(0.005)	(0.048)	(0.058)	(0.083)	(0.494)	(0.342)
Other debt maturity control variables		Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
Observations		4309	4309	4309	4309	4309	4309
$R^2_{adjusted}$		0.112	0.109	0.100	0.026	−0.135	−0.269

*** Indicates significance at the 1% level.
** Indicates significance at the 5% level.
* Indicates significance at the 10% level.

Table 5: Exploring Alternative Explanations

Table 5

Short-term debt and CEO overconfidence — exploring alternative explanations.

This table presents the results from IV-GMM regression (second-stage equation presented only). The models estimated are discussed in Section 3.3. The full sample contains 4309 observations and covers 2006 to 2012. Column (1) is the full specification of the model while Column (2) excludes *Abnormal Earnings*, Column (3) excludes *Log*(1 + *vega*), Column (4) includes natural logarithm of one plus annual stock return over past 3 years, Column (5) includes average past 3-year dividend yield, and Column (6) excludes *Stock Ownership* from the model. The dependent variable is ST, which is defined as short-term debt that matures in less than 12 months divided by total debt. *Longholder* is the CEO overconfidence proxy and is measured by a dummy variable taking a value of one if a CEO ever held an option to the final year of duration and the option is at least 40% in-the-money entering its last year. All variables are measured at fiscal year-end and details of their measurement are presented in Appendix B. Industry effects are based on the Fama-French 12 Industry Groups. Standard errors are clustered at firm level. The p-value is reported in parentheses.

		Alternative explanation					
Variables	Predicted sign	(1) Core results	(2) Insider information	(3) Risk tolerance	(4) Past performance	(5) Dividends	(6) Board pressure
Longholder	+	0.025**	0.025**	0.023**	0.025**	0.024**	0.023**
		(0.033)	(0.036)	(0.045)	(0.032)	(0.037)	(0.048)
Log(1 + delta)	−	−0.029***	−0.028***	−0.023***	−0.021***	−0.027***	−0.015***
		(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.004)
Log(1 + vega)	+	0.007**	0.007**		0.003	0.007*	0.002
		(0.043)	(0.044)		(0.548)	(0.057)	(0.550)
Stock ownership	+	0.608***	0.603***	0.483**	0.492**	0.574***	
		(0.005)	(0.006)	(0.025)	(0.010)	(0.008)	
Other control variables		Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
Past 3-year return		No	No	No	Yes	No	No
Past 3-year dividends		No	No	No	No	Yes	No
Observations		4309	4309	4309	4295	4309	4309
$R^2_{adjusted}$		0.119	0.117	0.117	0.132	0.117	0.110

*** Indicates significance at the 1% level.
** Indicates significance at the 5% level.
* Indicates significance at the 10% level.

Conclusion

- Overconfident CEOs use **Higher** Proportion of Short-term Debt
- Such Behavior is **not mitigated** by Liquidity Risk
- The Greater Willingness to accept Short-term Debt **mitigates** Agency Problem and **lowers** Syndicated Loan Costs