Effect of Managerial overconfidence, asymmetric Info, and moral hazard on Capital Structure Decisions.

Traditional Corporate Finance.

- MM Capital Structure Irrelevance
- Effects of moral hazard + asymmetric info.
- Debt reduces Moral Hazard Problems (eg JM, Jensen's FCF, Effort levels/efficiency)
- Debt signals quality
- Ross (1977): debt is a signal of Confidence.

Behavioural Corporate Finance

- managerial biases: effects on investment/ financing/dividend decisions
- Framing, regret theory, loss aversion, bounded rationality.
- OVERCONFIDENCE/OPTIMISM.

Overconfidence/optimism

- Optimism: upward bias in probability of good state.
- Overconfidence: underestimation of asset risk.
- My model =>
- Overconfidence: overestimation of ability.

Overconfidence: good or bad?

- Hackbarth (2002): debt decision: OC good.
- Goel and Thakor (2000): OC good: offsets mgr risk aversion.
- Gervais et al (2002), Heaton: investment appraisal, OC bad => negative NPV projects.
- Zacharakis: VC OC bad: wrong firms.

Overconfidence and Debt

- My model: OC => higher mgr's effort (good).
- But OC bad, leads to excessive debt (see Shefrin), higher financial distress.
- Trade-off.

Behavioral model of overconfidence.

$$\hat{p} > p, \hat{q} > q.$$

Both Managers issue debt:

$$M_g = \hat{p}R - \frac{2\hat{p}I}{p+q} - (1-\hat{p})b.$$

$$M_b = \hat{q}R - \frac{2\hat{q}I}{p+q} - (1-\hat{q})b.$$

Good mgr issues Debt, bad mgr issues equity.

$$M_g = \hat{p}R - \frac{\hat{p}}{p} I - (1 - \hat{p})b.$$

$$M_b = \hat{q}R - \frac{\hat{q}}{q} I.$$

Both mgrs issue equity.

$$M_g = \hat{p}R - \frac{2\hat{p}}{p+q} I,$$

$$M_b = \hat{q}R - \frac{2\hat{q}}{p+q} I.$$

Proposition 1.

a) If $\dfrac{\hat{q}(p-q)}{q(p+q)} I \geq (1-\hat{q})b > (1-\hat{p})b, \qquad \{S_g = S_b = D\}.$

b) $(1-\hat{q})b \geq \dfrac{\hat{q}(p-q)}{q(p+q)} I > (1-\hat{p})b, \qquad \{S_g = D, S_b = E\}.$

c) $(1-\hat{q})b > (1-\hat{p})b \geq \dfrac{\hat{q}(p-q)}{q(p+q)} I, \qquad \{S_g = S_b = E\}.$

Overconfidence leads to more debt issuance.

Overconfidence and Moral Hazard

- Firm's project: 2 possible outcomes.
- Good: income R. Bad: Income 0.
- Good state Prob: $P = (\lambda + \gamma)e \in (0,1]$.
- True: $\gamma = 0$.
- Overconfidence: $\gamma > 0$.
- True success prob: $P = \lambda e$.

Manager's *Perceived* Payoffs

$$\hat{M}_D = \hat{P}(R - D) - (1 - \hat{P})b - \beta e^2 + PD - I.$$

$$\hat{M}_E = \alpha \hat{P} R - \beta e^2 + (1 - \alpha) PR - I.$$

Optimal effort levels

$$e_D^* = \frac{(\lambda + \gamma)(R - D + b)}{2\beta}$$

$$e_E^* = \frac{(\lambda + \gamma)(R - D)}{2\beta}$$

Effect of Overconfidence and security on mgr's effort

- Mgr's effort is increasing in OC.
- Debt forces higher effort due to FD.

Manager's perceived *Indirect* Payoffs

$$\hat{M}_D = \frac{(\lambda+\gamma)^2(R-D+b)^2}{4\beta} + \frac{\lambda(\lambda+\gamma)(R-D+b)D}{2\beta} - I - b$$

$$\hat{M}_E = \frac{(\lambda+\gamma)^2(R-D)^2}{4\beta} + \frac{\lambda(\lambda+\gamma)(R-D)D}{2\beta} - I$$

$$\Delta\hat{M}_D = \frac{(\lambda+\gamma)^2(2b(R-D)+b^2)}{4\beta} + \frac{\lambda(\lambda+\gamma)bD}{2\beta} - b.$$

True Firm Value

$$V_D = P_D(R+b) - b = \frac{\lambda(\lambda+\gamma)(R-D+b)(R+b)}{2\beta} - b.$$

$$V_E = P_E R = \frac{\lambda(\lambda+\gamma)(R-D)R}{2\beta}.$$

Effect of OC on Security Choice

$$\Delta\hat{M}_D(\gamma=0)=\frac{\lambda^2(2b(R-I)+b^2)}{4\beta}+\frac{\lambda^2 bD}{2\beta}-b<0$$

$$\frac{\partial\Delta\hat{M}_D}{\partial\gamma}>0 \quad \Rightarrow \Delta\hat{M}_D(\gamma=\gamma_C)=0.$$

$\gamma \in [0,\gamma_C]$, Manager issues Equity.

$\gamma > \gamma_C$, Manager issues Debt.

Effect of OC on firm Values

$$V_E(\gamma = 0) = \frac{\lambda^2 (R - D)R}{2\beta}.$$

$$V_D(\gamma \geq \gamma_C) = \frac{\lambda(\lambda + \gamma)(R - D + b)(R + b)}{2\beta} - b.$$

$$\Delta V_D = \frac{(\lambda^2 + \lambda\gamma)(2bR - Db + b^2) + \lambda\gamma R(R - D)}{2\beta} - b$$

Results

- For given security: firm value increasing in OC.
- If $\Delta V_D(\gamma = \gamma_C) > 0,$
- Firm value increasing for all OC: OC good.
- Optimal OC: $\gamma^* = \gamma_{\max}.$
- If $\Delta V_D(\gamma = \gamma_C) < 0,$
- Medium OC is bad. High OC is good.
- Or low good, high bad.

Results (continued).

- If $\Delta V_D(\gamma = \gamma_C) < 0,$
- 2 cases: Optimal OC: $\gamma^* = \gamma_{\max}.$
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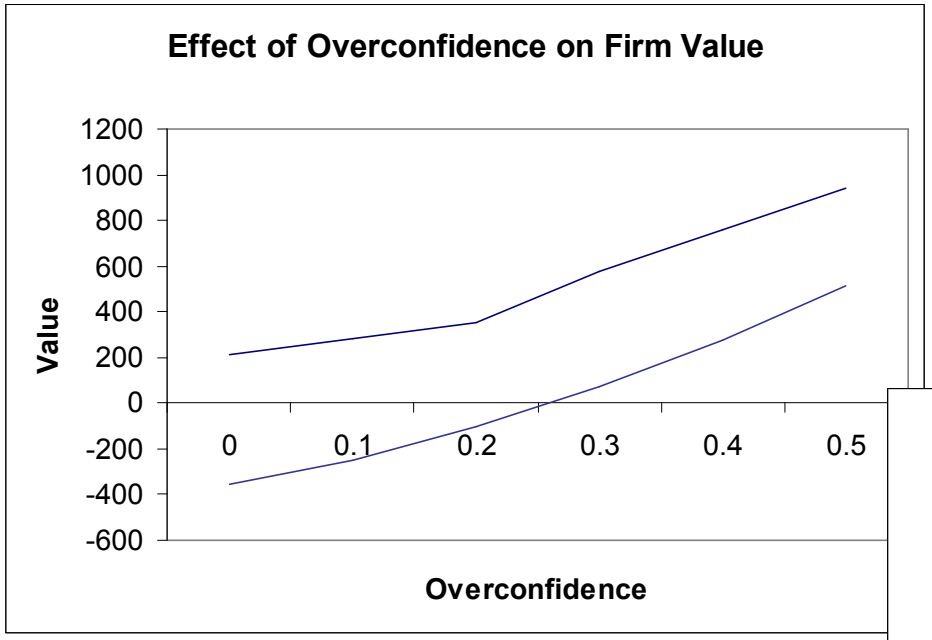
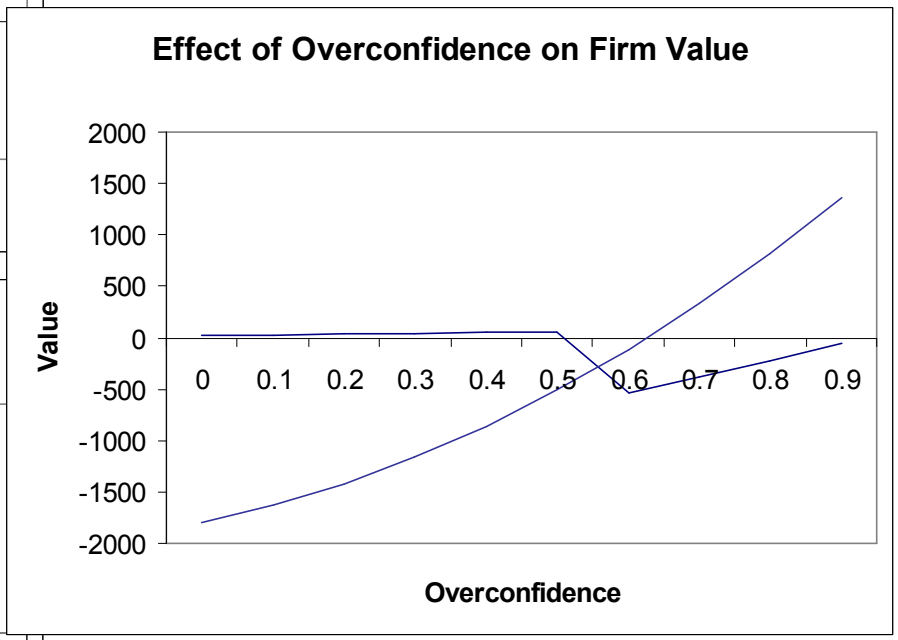
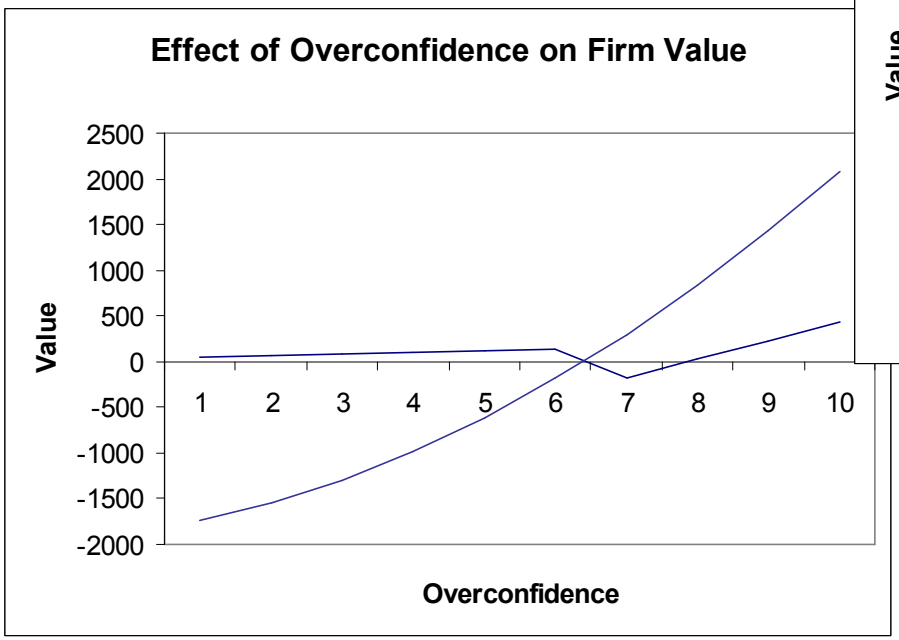
- Or Optimal OC: $\gamma^* = \gamma_C - \delta.$


Effect of Overconfidence on Firm Value
1200
1000
800
600
400
200
0
-200
-400
-600
Value
0
0.1
0.2
0.3
0.4
0.5
Overconfidence


Effect of Overconfidence on Firm Value
2000
1500
1000
500
0
-500
-1000
-1500
-2000
Value
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Overconfidence


Effect of Overconfidence on Firm Value
2500
2000
1500
1000
500
0
-500
-1000
-1500
-2000
Value
1
2
3
4
5
6
7
8
9
10
Overconfidence

Conclusion.

- Overconfidence leads to higher effort level.
- Critical OC leads to debt: FD costs.
- Debt leads to higher effort level.
- Optimal OC depends on trade-off between higher effort and expected FD costs.