THE PARADOX OF PLEDGEABILITY

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FACTS

Collateral matters

Current theories suggest collateral matters for low pledgeability

"Collateral pledging makes up for a lack of pledgeable cash"

E.g. weak legal system, low creditor rights, low reputation

But collateral also matters when pledgeability is high

Interbank markets, syndicated loans, etc.

E.g. strong law, creditor rights, regulation, reputation

QUESTIONS

Why does collateral matter when pledgeability is high?

And is collateral always good for borrowers?

ROLE OF COLLATERAL

Role of collateral in most finance papers

- Mitigate enforcement problem between borrower and creditor

Role of collateral in this paper

- Mitigate enforcement problem among creditors

These roles correspond to two components of property rights

- "Right of access": right to seize collateral
- "Right of exclusion": right to stop others seizing collateral

THIS PAPER

Model of sequential financing based on three key assumptions

Assumption 1: Pledgeability is limited

Can divert a fraction of cash flows

Assumption 2: Contracts are non-exclusive

Can't commit not to borrow form third party

Assumption 3: Assets can be collateralized

Collateralized assets cannot be pledged to third party

LAWYERS' VIEW

"A secured transaction is the protection...against the claims of competing creditors"

—Kronman and Jackson (1979)

"Borrowers...may protect lenders against dilution by issuing secured debt"

—Schwarz (1997)

RESULTS

Paradox of pledgeability

Cannot borrow unsecured when pledgeability is high

Collateral rat race

Creditors require collateral to protect against collateral

Collateral overhang

Collateral prevents investment in positive NPV projects

MODEL

MODEL OVERVIEW

Three dates $t \in \{0, 1, 2\}$ and two states $s \in \{L, H\}$

s realized at Date 1, $\mathbb{P}[s = H] =: p$

Two riskless projects

Project 0 at Date 0

Project 1 at Date 1

At Date t, B can borrow from creditor C_t to invest in Project t

B can borrow secured (i.e. "collateralized") or unsecured

PROJECTS

Project 0

Costs I_0 at Date 0

Pays off X_0 at Date 2

Project 1

Costs I_1^s at Date 1 in state s

Pays off X_1^s at Date 2

PLEDGEABILITY

Fraction θ of payoff is pledgeable

B can divert proportion $1 - \theta$ of project payoff

Creditors get up to θ of payoff according to priority

BORROWING AND INVESTMENT

B borrows from creditor C_t at Date t secured or unsecured

Secured debt

B can secure pledgeable payoff to a creditor

If B secures fraction σ, creditor gets exclusive claim to $\sigma\theta X$

Unsecured debt

B can promise pledgeable payoff unsecured

But B may collateralize projects to another creditor

CONTRACTING ENVIRONMENT

1. Courts treat secured debt as senior

> "the absolute priority rule describes the basic order of payment in bankruptcy. Secured creditors get paid first, unsecured creditors get paid next"
>
> —Lubben (2016)

2. B cannot commit not to collateralize

> "the secured party whose presence violates the [negative pledge] covenant is entitled to repayment from the collateral before the injured negative pledgee"
>
> —Bjerre (1999)

3. Collateral is not state contingent

> C_0 is there at Date 0, but not at Date 1

TIMELINE

Date 0	B borrows I_0 from C_0 secured or unsecured
	If borrows, B invests in Project 0
Date 1	State s is revealed
	B borrows I_1^s from C_1 secured or unsecured
	If borrows, B invests in Project 1
Date 2	Projects payoff, repayments made, players consume

PARAMETER RESTRICTIONS

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1. Pledgeable fraction of Project 0 is large enough to repay I_0

$$(1-p)\theta X_0 > I_0$$

2. Project 1 has positive NPV in $s = H$ and negative NPV in $s = L$

$$X_1^H > I_1^H \quad \text{and} \quad X_1^L < I_1^L$$

3. Combined pledgeble cash flow less than costs in both states

$$\theta\left(X_0 + X_1^s\right) \leq I_0 + I_1^s$$

4. But greater than cost of Project 1 in state H

$$\theta\left(X_0 + X_1^H\right) \geq I_1^H$$

RESULTS

BENCHMARK: FIRST BEST

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Project undertaken iff positive NPV

Date 0: Invest in Project 0

Date 1, state H: Invest in Project 1

Date 1, state L: Do not invest in Project 1

OVER-INVESTMENT PROBLEM

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B always wants to invest in Project 1

Suppose B borrows secured from C_1

Dilutes any unsecured debt B has to C_0

B transfers cost of Project 1 to C_0

B thus captures PV of Project 1, not NPV

B borrows and invests even if negative NPV

RESULT 1: UNSECURED DEBT ACHIEVES FB FOR LOW θ

UNSECURED DEBT ACHIEVES FB FOR LOW θ

B always wants to invest at Date 1 so FB attained unsecured iff

Unconstrained in state H:

$$\theta\left(X_0 + X_1^H\right) \geq I_1^H$$

But constrained in state L:

$$\theta\left(X_0 + X_1^L\right) < I_1^L$$

B always unconstrained in H; B constrained in L iff

$$\theta < \theta^* := \frac{I_L}{X_0 + X_1^L}$$

FB attained with unsecured debt iff pledgeability low ($\theta < \theta^*$)

RESULT 2: PARADOX OF PLEDGEABILITY

PARADOX OF PLEDGEABILITY

Increasing pledgeability relaxes borrowing constraint with C_1

Standard effect of pledgeability

Increasing pledgeability tightens borrowing constraint with C_0

New effect of pledgeability

PARADOX OF PLEDGEABILITY

Suppose θ is high

If C_0 lends unsecured, B dilutes C_0 in $s \in \{L, H\}$

C_0 is not repaid in either state

So C_0 will not lend unsecured for high pledgeability

RESULT 3: COLLATERAL RAT RACE

COLLATERAL RAT RACE

C_0 requires collateral as protection against dilution

Collateralization protects against collateralization

COLLATERAL RAT RACE

If B collateralizes σ_0 of Project 0, FB attained iff

Unconstrained in state H:

$$\theta\Big((1-\sigma_0)X_0 + X_1^H\Big) \geq I_1^H$$

But constrained in state L:

$$\theta\Big((1-\sigma_0)X_0 + X_1^L\Big) < I_1^L$$

or

$$\frac{I_1^H - \theta X_1^H}{\theta X_0} \leq 1-\sigma_0 < \frac{I_1^L - \theta X_1^L}{\theta X_0}$$

Feasible for some $\sigma_0 \in [0,1]$ whenever I_1^H not too large

RESULT 4: COLLATERAL OVERHANG

COLLATERAL OVERHANG

If I_1^H is large, can't attain first best

B constrained in state H

Collateralization prevents borrowing and efficient investment

Pledgeability causes "asset encumbrance"—collateral overhang

"Asset encumbrance not only poses risks to unsecured creditors...but also has wider...implications since encumbered assets are generally not available to obtain...liquidity"

PLEDGEABILITY VS. COLLATERALIZABILITY

PLEDGEABILITY VS. COLLATERALIZABILITY

Suppose fraction of a project is pledgeable but not collateralizable

Can be seized in the future

but hard to assign property rights to today

E.g. assets built while doing project, don't even exist at inception

Specifically B can collateralize at most μ_t of Project t at Date t

I.e. $\sigma_t \leq \mu_t$, so B collateralizes at most $\mu_t \theta X_t$

RESULT 5: COLLATERAL DAMAGE

COLLATERAL DAMAGE

First best is attained only if μ_1 is sufficiently small

High μ_1 makes it easier to borrow collateralized at Date 1

Triggers collateral rat race

Higher μ_1 means μ_0 must be higher to protect against dilution

More collateral used at Date 1, more required at Date 0

Collateral demand may be increasing in collateral supply

TWO ROLES OF COLLATERAL

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Reliance on collateral is u-shaped in θ

Low θ: classical role of collateral dominates

Collateralize to make up for lack of pledgeable cash

High θ: new role of collateral dominates

Collateralize to protect against dilution

CONCLUSIONS

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Collateral protects creditors against the claims of other creditors

Paradox of pledgeability

- High pledgeability makes it easier to dilute
- Induces collateral rat race

Can't do projects due to collateral overhang—asset encumbrance

More collateral may decrease efficiency—collateral damange

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