A Back-up Quarterback View of Mezzanine Finance

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“Mezzanine financing is basically debt capital that gives the lender the rights to convert to an ownership or equity interest in the company if the loan is not paid back in time and in full. It is generally subordinated to debt provided by senior lenders such as banks and venture capital companies.”
Motivation

- Intermediate seniority financing (Mezz loans, e.g.) is ubiquitous

- What purpose does it serve?
  1. Completes the market
  2. Expert capital (Holstrom and Tirole, 1997)
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- What purpose does it serve?
  1. Completes the market
  2. Expert capital (Holstrom and Tirole, 1997)
  3. This paper: back-up QB
Basic mechanism

- In the presence of moral hazard, threatening to foreclose on debt-claims helps provide incentives . . .
- . . . but it is a blunt (ex-post inefficient) tool
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- Senior lenders must either commit to ex-post inefficient actions, or leave some surplus on the table
- Skilled investors with foreclosure rights on ownership provide the same incentives . . .
- . . . without dead-weight loss
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- Senior lenders must either commit to ex-post inefficient actions, or leave some surplus on the table
- Skilled investors with foreclosure rights on ownership provide the same incentives . . .
- . . . without dead-weight loss
- Back-up QBs are essential
Literature

- Holstrom and Tirole (1997)
- De Marzo and Fishman (2007)
Literature

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Other related papers
The model

- \( t = 0, 1, 2 \), one good, no discounting
- Agents 1 and 2 are endowed with \( \epsilon \in [0, \frac{1}{2}) \) at date 0
- Either agent can operate a risky project
- Agent \( P \) has one unit of the good at date 0 but no ability to run the project
Projects

- Project requires 1 unit of good at date 0
- If activated and operated by agent 1, the project yields $y_H$ at date 1 with probability $\pi$.
- ... and, again, $y_H > 0$ at date 2 with probability $\pi$.

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- If agent 2 is at the helm, output if successful is $\theta y_H$, where $\theta \in [0, 1]$.
- At date 1 the project can be interrupted for payoff $S$
Moral hazard

- Only the operator observes output
- They can secretly consume $y$ at utility cost $\phi y$
- Idle agents earn outside and inalienable utility $V_o$
Bilateral contracts

1. Investment $k_1 \leq \epsilon$ by agent 1 and $k_P \leq 1$ by principal
2. Payment $\{w_i(h) \geq 0 : i = 1, 2\}$ from the principal to the agent for all possible histories $h$ of cash flow, and,
3. Screeing probabilities $s(0), s(y_H)$
Date 2 problem

The principal maximizes:

$$W_2^c(V_2) = \max_{w_2^L, w_2^H} \pi (y_H - w_2^H) + (1 - \pi) (-w_2^L)$$

subject to:

$$\pi w_2^H + (1 - \pi) w_2^L = V_2 \text{ (promise keeping)},$$

$$w_2^H \geq w_2^L + (1 - \phi) y_H \text{ (truth telling)},$$

and

$$w_2^H, w_2^L \geq 0 \text{ (limited liability)}.$$
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Period 2 value function

\[ \pi y_H \]

First best is the 45 degree line

Scrap with probability 1

\[ S \]

\[ \phi \pi y_H \]

\[ V_o \]

\[ \pi(1 - \phi)y_H \]

\[ \pi y_H \]

\[ V_2 \]
Period 2 value function

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Randomization region

\[ \pi y_H \]

\[ \phi \pi y_H \]

\[ S \]

\[ V_0 \]

\[ \pi (1 - \phi) y_H \]

\[ \pi y_H \]

\[ V_2 \]

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Period 1 value function

\[ W_1(V_1|k_P) = \max_{w_H^1, w_L^1, V_H, V_0} \pi \left[ y_H - w_H^1 + W_2(V_H) \right] \]

\[ + (1 - \pi) \left[ -w_L^1 + W_2(V_L) \right] - k_P R \]

subject to:

\[ \pi \left[ w_H^1 + V_H \right] + (1 - \pi) \left[ w_L^1 + V_L \right] \geq V_1 \text{ (promise keeping)} \]

\[ w_H^1 + V_H^2 \geq w_L^1 + V_L^2 + (1 - \phi) y_H. \text{ (truth telling)} \]

\[ w_H^1, w_L^1 \geq 0 \text{ (limited liability)} \]

and

\[ V_H^2, V_L^2 \geq V_0 \text{ (lower bound on agent payoff at date 2)} \]
Why scrap?

Assume $V_1 = 0$.
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1. Continue with probability one:

$$\pi y_H + \pi y_H - [\pi(1 - \phi)y_H + \pi(1 - \phi)y_H] - k_P R.$$ 

2. Scrap if bad announcement:

$$\pi y_H + \pi^2 y_H + (1 - \pi) S - \pi(1 - \phi)y_H - k_P R.$$
Why scrap?

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2. Scrap if bad announcement:

$$\pi y_H + \pi^2 y_H + (1 - \pi) S - \pi (1 - \phi) y_H - k_P R$$

For $\pi$ high enough, option 2 wins.
Proposition

The set of solutions to the principal’s problem satisfies:

1. If and only if

\[ 2V_o + \epsilon R < \pi(1 - \phi)y_H + \pi(1 - \phi)y_H \]

then all solutions satisfy \( k_1 = \epsilon \) and \( k_P = 1 - \epsilon \);
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then all solutions satisfy \( k_1 = \epsilon \) and \( k_P = 1 - \epsilon \);

2. The project is scrapped with positive probability if and only if

(a) \( 2V_o + \epsilon R < \pi(1 - \phi)y_H + \pi(1 - \phi)y_H \), and,
(b) \( \pi - (1 - \pi)\frac{\phi \pi y_H - S}{\pi(1 - \phi)y_H - V_o} > 0 \)
Period 2 value function

First best is the 45 degree line

Scrap with probability 1

Randomization region

\( V_o \)

\( \pi H \)

\( \phi \pi H \)

\( S \)
Needed: a back-up QB

- Inefficient scrapping may happen because it gives the right incentives to the original operator
- Project gets scrapped even though it has positive NPV
- Even when it doesn’t happen inside the contract, the principal is forced to overcompensate the agent
- Obvious alternative: fire the original operator and replace him with a new one

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Contracts with back-up QB

1. Contributions $k_1 \leq \epsilon$, $k_2 \leq \epsilon$, and $k_P \leq 1$
2. Operator name \{\(\kappa_i(x) \in \{1, 2\} : i = 1, 2\)\} for all possible histories
3. Payment schedules \(\{w_{ij}(h) \geq 0 : i = 1, 2, j = 1, 2\}\) for each agent,
4. Scrapping probabilities \(s(0), s(y_H)\)
Proposition

The maximal payoff the principal can generate with a back-up quarterback in place strictly exceeds all payoffs she can generate with bilateral contracts if and only if:

1. $2V_0 + \epsilon R < \pi(1 - \phi)y_H + \pi(1 - \phi)y_H$, and
2. $\theta$ is sufficiently close to 1.
Proposition

If $\epsilon > 0$ then all contracts with a back-up QB involve $k_2 > 0$.

Furthermore, if and only if

$$V_O + \epsilon R < \pi (1 - \phi) y_H$$

then a strictly positive fraction of the capital commitment $k_2$ must take place **BEFORE** date 1 uncertainty is resolved.
Comparative statics

Corollary

The minimal contribution by the original owner to the project and the minimal contribution of capital by the back-up agent increase strictly with project quality \((\pi)\) and falls strictly with the value of the outside option \((V_0)\) or the cost of misreporting \((\phi)\).
De Marzo and Fishman point out that if termination takes the form of a like-for-like agent replacement, termination is renegotiation-proof. Having such a replacement available is beneficial in their model. Proof: value of termination goes up.
Our contribution

1. Back-up agents need not be the same as original agents, they just need to be good enough

2. Having a replacement in place is strictly beneficial to the principal whether or not termination occurs with positive probability in bilateral arrangements

3. It is typically optimal to have the back-up agent in place commit to the contract \textit{before} it is known whether or not they will be needed

4. Even more generally true when poaching by competing principals is a possibility
Poaching

- Principals need to secure the participation of back-up QBs when needed
- But back-up QBs have an incentive to play the field (especially when they are idle)
- What are the consequences of poaching?
Sequential game of poaching

- Add a second principal with an operating agent 1’ ready
- Agent 1’ is identical to Agent 1 but attached to a different project
Sequential game of poaching

- Add a second principal with an operating agent 1’ ready
- Agent 1’ is identical to Agent 1 but attached to a different project
- The outcome of the two projects are perfectly correlated
- Projects are only profitable with a back-up QB
- Only agent 2 can be poached
Timing

- Principal 1 offers a contract to agents 1 and 2
- Agent 2 accepts or rejects the offer;
- Principal 2 either offers a contract to agents 1' and 2, or makes no offer
- Agent 2 accepts or rejects this second offer
Back-up QBs must commit early

Proposition

All subgame perfect equilibria of the poaching game are such that \( k_{12} > \frac{\epsilon}{2} \) in the contract proposed by the first principal.
“If you’ve never owned and operated properties, you probably shouldn’t be a mezzanine lender, because you’re really not well positioned to take over properties.”

Bruce Batkin, CEO of Terra Capital Partners.
Our model applies neatly to the context of CRE:

1. Significant asymmetric information such as unobservable effort on the part of the owner
2. The foreclosure process that protects first mortgages is slow and onerous
3. Senior lenders tend to be institutions such as banks and insurance companies with limited expertise and operating capacities

Mezzanine loans in RE are structured exactly as our model says they should be

Foreclosing on mezzanine is expeditious and cheap

Mezzanine lenders, unlike senior lenders, tend to be industry specialists and have operating capacities
Holding Company

Mortgage Borrower

Property

Mezzanine Lender

Senior Lender

 owns

 owns

owns

owns

owns

(Promissory note)

(mortgage)

Intercreditor agreement

Lien

Pledge

Loan

Pledge

Loan

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Mezz as back-up QB
Mezz lenders are back-up QBs, their presence makes it cheaper to provide the right incentives to the original owner.

They are an efficient foreclosure device.

Particularly useful in industries where senior debt is collateralized by real estate.