Leverage and Preemptive Selling of Financial Institutions

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Very Simple Model of...

Fl = Financial Institution

Questions:

1. How quickly should individual FIs get rid of assets if fundamental values decline?
   “Preemptive Selling”

2. How much debt should individual FIs take?
FI = Financial Institution

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1. How quickly should individual FIs get rid of assets if fundamental values decline?
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2. How much debt should individual FIs take?
Assumptions: Non-financial sector is worse at owning assets than FIs. FIs are competitive. FIs are leveraged. Fundamental values have just dropped, so every FI is now more worried.

Sell Immediately
Avoid all possibility of interim liquidation
if hit, sell *with* peers
Safe Choice

Hold onto Assets
Hope you won’t need interim cash
if hit, sell *behind* peers
Risky Choice
Out-of-Equilibrium Scenario I

- Not a single peer financial institution sells.
- As first seller, you get risk-neutral price.
  \[ \Rightarrow \text{SELL} \]
- ... unless are sure that you will not have to sell in the interim.

No FI selling is usually not an equilibrium, unless price remains very high.
Every other peer financial institution sells.

If you are selling, too, as one of many, you get low price.

⇒ Take your chances

- Yes, selling behind the herd is still worse than selling with the herd.
- But getting lucky (no interim liquidation) is now getting real lucky.

Everyone selling is not an equilibrium, unless price goes very low.
An interior fraction of FIs that sell immediately, so that

\[
\text{EV (selling immediately)} = \text{EV (holding on)}
\]
Let’s plot

- \textbf{X-axis} = \text{frac of all FIs selling at time 0}.
- \textbf{Y-axis} = \text{expected net benefit to selling immediately for one FI (i.e., you)}. 
S = Benefit of Selling Preemptively
-- Benefit of Holding On
(for individual FI)

Selling preemptively is better
Get $P_1$ for sure

Holding on is better
Get $\mu_L$ (lucky) or $P_2$ (unlucky)

(Unlevered banks never sell.)
Function, $\mu_L = 0.75$

Expected (Final) Asset Value Is Still Very High

$\mu_L = 0.75$

(Unlevered banks never sell.)
Expected Asset Value A Little Lower — you might get hit.

(Unlevered banks never sell.)
Expected Asset Value Even Lower.

\( S, \text{ in } \% \)

\( \alpha_1 \)

\( \mu_L = 0.35 \)

\( \mu_L = 0.4 \)

\( \mu_L = 0.75 \)

\( p_0 = 0.8 \)

\( M_0 = 0.8 \)

\( \bar{M} = 0.9 \)

\( p_0 M_0 - \bar{M} p_1 = \)

(Unlevered banks never sell.)
$S$ Function, $\mu_L = 0.30$

Asset Value Really Low.

(Unlevered banks never sell.)

$p_0 = 0.8$
$M_0 = 0.8$
$\overline{M} = 0.9$
$p_0M_0 - \overline{M}p_1 = \frac{12}{1}$
Map Fraction Selling to Asset Value

(Unlevered banks never sell early.)
“Fragile”!? 

Note how changes in value often matter little...

...but then suddenly A LOT

(Competitive FI Sector. Musical Chairs.)
How does the fraction of selling FIs change?

- Asset value dropped more $\rightarrow$ more FIs sell.
- Tighter margin constraints $\rightarrow$ more FIs sell.
- F Sector better capitalized $\rightarrow$ fewer FIs sell.
- Banking relatively more profitable $\rightarrow$ fewer FIs sell.
Bank Leverage

Knowing this, would FIs not avoid leverage?
Or reduce (incoming) leverage?

Yes!

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Substitutes

- Holding constant time-1 preemptive selling, less time-0 leverage takes down risk.
- Holding time-0 leverage constant, more preemptive time-1 selling takes down risk.

- Economics makes both useful tools (complements)
- ...unless time-0 leverage has become so extreme that really only time-1 preemptive selling remains.
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Typical Implication

Situation becomes “less risky.” In equilibrium

- FIs take on more leverage
- and sell less preemptively (in eqbm).

... unless they have max leverage
and they still want more assets
so they rely more on preemptive selling

Risk → first less pre-selling, but then Risk → more pre-selling.
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Risk → first less pre-selling, but then Risk → more pre-selling.
Equilibrium is now both leverage at \( t=0 \) and subsequent preemptive selling at \( t=1 \).

(Resulting equilibrium interest rate, too.)

Full set of comparative statics.
Empirical Implications

- Preemptive selling not due to current hard margin constraints, but due to fear of future margin constraints.
- FIs look at aggregate FI conditions, not just their own balance sheets.
- FIs first delever if they can. Then pre-sell.
- Margin constraint-related implications.
- Feedback (contagion) effect.
  Price declines → more price declines.
- Fragility.
  Looking at individual comparative statics may be possible, but is too delicate for reduced-form spirit of the model.
Conclusion

Big model assumption—markets are not perfect in unrolling. [Not just our paper, many others.] It can matter whether you sell first or last. Liquidity can matter. Otherwise, prices adjust immediately, and selling behind everyone else never matters.

More assumptions: no claim that other effects that we neglected are not important. Our model is a sketch to highlight effects.

- First Model on Preemptive Selling in Financial Sector
- Among early models about determinants of Aggregate Financial Sector Leverage
- Among early models of Financial sector → FI behavior.
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