Financial Restructuring and Resolution of Banks

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Roadmap

Introduction

Model

Private restructuring

Restructuring with government involvement

Conclusion
Bank resolution and restructuring

- Bank resolution regimes:
  - Forced restructuring of liabilities (bail-out/bail-in)
  - US Dodd-Frank Act
  - EU Bank Recovery and Resolution Directive

- Aims:
  - Minimize costs to the taxpayer (bail-outs)
  - Avoid adverse consequences of disorderly failures

- Banks also restructure privately
  - Claimants renegotiate liabilities
  - E.g. European banks’ Liability Management Exercises
  - But this process can be less than smooth
Monte dei Paschi di Siena

- Share price
- 5Yr CDS
- 1Yr CDS

Graph showing changes in share price, 5Yr CDS, and 1Yr CDS from 01/09/16 to 02/01/17.
The main idea

How does resolution affect private restructuring?

1. Why are private restructurings long and inefficient?
   ▶ Asymmetric information over assets ⇒ delay as a signal
   ▶ Renegotiation benefits the government ⇒ externality

2. Impact of tougher resolution regimes (i.e. lower bailouts)?
   ▶ Surplus effect ⇒ delay ↙
   ▶ Signaling effect ⇒ delay ↗

3. Implications for resolution design?
   ▶ Optimal bail-out trades off both effects (tougher ≠ better)
   ▶ Direct government involvement in negotiations?
Recent models of resolution: Landier and Ueda (2009), Keister and Mitkov (2016), Walther and White (2016), Bolton and Oehmke (2016).


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The bank

- **Assets:**
  - With probability $p$, payoff $Z > 0$ (payoff $= 0$ otherwise)
  - Only the bank manager knows quality $p$

- **Liabilities:**
  - Insured deposits $D$
  - Uninsured debt $R_0$

- **Monitoring:**
  - The manager (= shareholders) can incur cost $c > 0$
    \[ \Rightarrow p \text{ increases to } (p + m) \]

- **Debt overhang problem:**
  - Denote $X = Z - D$
    \[ mX > c \quad \text{but} \quad m(X - R_0) < c \]
    \[ \Rightarrow \text{Gains from restructuring} \]
Restructuring/Resolution

Restructuring

- The manager chooses:
  - Debt write-down offer: from $R_0$ to $R$
  - Time of offer $t \in [0, +\infty)$

- Creditors accept if payoff exceeds statu quo

- In each period $dt$, the game stops with proba. $\beta dt$

Resolution

- The bank defaults with proba. $(1 - p)$ or $(1 - p - m)$
- Insured deposits $D$ paid in full from insurance fund
- **Uninsured creditors $R$ incur a haircut $h$** ⇒ Gvt. pays $(1 - h)R$
- Shareholders get 0
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Payoffs

- In status quo, shareholders and creditors obtain:

\[ S_0(p) = p(X - R_0) \]
\[ C_0(p) = pR_0 + (1 - p)(1 - h)R_0 \]

- Asymmetric information \implies Creditors’ belief \( \hat{p} \) is important

- For a given belief \( \hat{p} \), creditors accept \( R(\hat{p}) \) such that:

\[ C_0(\hat{p}) = (\hat{p} + m)R(\hat{p}) + (1 - \hat{p} - m)(1 - h)R(\hat{p}) \]
\[ \Leftrightarrow \quad R_0 - R(\hat{p}) = \frac{mh}{1 - (1 - \hat{p} - m)h} \]

Manager wants to convey that \( p \) is low to get a write-down
Post-restructuring payoffs:

\[
S(\hat{p}, p) = (p + m)[X - R(\hat{p})] - c
\]
\[
C(\hat{p}, p) = [1 - (1 - p - m)h]R(\hat{p})
\]

**Delay as a signal**: higher asset quality \( p \) ⇒ default is less likely ⇒ write-down more valuable ⇒ delay is more costly
Separating equilibrium: bank of type $p$ makes an offer $R(p)$ after delay $\Delta(p)$.

Bank shareholders’ payoff:

$$U(t, p) = \left[ 1 - e^{-\beta t} \right] S_0(p) + e^{-\beta t} S(\Delta^{-1}(t), p).$$

Equilibrium condition: for any type $p$, shareholders’ payoff is maximized in $t = \Delta(p)$:

$$U_1(t, p) = e^{-\beta t} \left[ (\Delta^{-1})'(t) S_1(\Delta^{-1}(t), p) - \beta [S(\Delta^{-1}(t), p) - B_0(p)] \right] .$$

$$U_1(\Delta(p), p) = 0 \iff \dot{\Delta}(p) = \frac{S_1(p, p)}{\beta [S(p, p) + C(p, p) - S_0(p) - C_0(p)]} .$$
Equilibrium delay

\[ \Delta(p) = \int_{p}^{1-m} \frac{-S_1(x, x)}{\beta[S(x, x) + C(x, x) - S_0(x) - C_0(x)]} \, dx \]

- Delay decreases in \( p \)

- **Signaling effect**
  - Delay increases in \( |S_1| \)
  - Larger gain from conveying \( p \) is low \( \Rightarrow \) longer \( \Delta \) to signal

- **Surplus effect**
  - Delay decreases with total bargaining surplus
    \[ S(x, x) + C(x, x) - S_0(x) - C_0(x) \]
  - Higher cost of breakdown \( \Rightarrow \) shorter \( \Delta \)
Haircut’s impact on delays

- **Surplus effect:**
  - Less bailout $\Rightarrow$ lower total payoff w/ and w/o restructuring
  - But larger effect w/o restructuring as default proba. is higher
    $\Rightarrow$ higher bargaining surplus $\Rightarrow \Delta \downarrow$

- **Signaling effect**
  - Less bailout $\Rightarrow$ creditors lose more w/o restructuring
  - Willing to concede larger write-downs
    $\Rightarrow$ higher gain from pretending $p$ is low $\Rightarrow \Delta \uparrow$

**Corollary**

*As the haircut $h$ increases, the delay $\Delta(p)$ first decreases and then increases for low enough asset quality $p$, and always increases otherwise.*
\[ \Delta(p) \]

- \( p=0 \)
- \( p=0.1875 \)
- \( p=0.375 \)
- \( p=0.5625 \)
Optimal haircut

- Creditor losses have a social cost $\eta$ (e.g., systemic risk)
- Conditionally on default, the government’s loss is:

$$D + (1 - h)R + \eta hR$$

- Optimal haircut trades-off ex-post/ex-ante forces:
  - Avoid creditor losses under resolution
  - Favor quicker private restructuring to avoid resolution

Proposition

- If $\eta \leq 1$, optimal haircut $\geq$ delay-minimizing haircut
- If the bank relies more on deposits, the optimal haircut is closer to the delay-minimizing haircut
Delay-minimizing and optimal haircuts

\[ h = h^*(p), \eta = 1, D = 1 \]
\[ h**(p), \eta = 1, D = 0.5 \]
\[ h**(p), \eta = 1.5, D = 1 \]
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The problem is partly the externality on the government.

The government could subsidize the bank to restructure debt, which reduces $\Delta$ (surplus effect).

The bank manager makes the following offer:

- Creditors: new debt repayment $R$
- Government: transfer $T$ to the shareholders

If the offer is rejected, the government can make a counter-offer, etc.
Impact of government involvement

Corollary

For high asset quality $p$, government involvement has no effect. For lower asset quality $p$, it can increase or decrease the delay.

Intuition:

- **Surplus effect**: gvt. involvement makes the manager internalize the impact on the deposit insurance fund ⇒ shorter $\Delta$

- **Signaling effect**: even more incentives to pretend the bank’s quality is low to extract larger subsidies ⇒ longer $\Delta$
Example

\[ \Delta G(p) \]

\[ \Delta(p) \]
Take-away

- The government may be better off committing not to participate in the negotiations.
- Lower bail-outs may weaken the government’s position.
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Conclusion - 1

- First step towards analyzing the complex negotiations in distressed banks

- Very stylized model, highlighting two general effects:
  - Surplus effect: more to gain fosters negotiations
  - Signaling effect: information-sensitivity $\Rightarrow$ slower negotiations

- Optimal resolution framework must trade-off these two effects as well as ex-post efficiency
Conclusion - 2

- Invitation to apply insights from bargaining theory to financial distress problems

- Without frictions, renegotiation always happens (Haugen and Senbet (1978))

- This result fails in the presence of:
  - **Externalities** (e.g., Jehiel and Moldovanu (1995)): renegotiation is good for the government
  - **Asymmetric information** (e.g., Cramton (1984)): bank managers are more informed about the bank’s soundness

- Both issues seem particularly relevant for banks, but not only (Alitalia, Greece)
Thank you!


References II


