Financial Restructuring and Resolution of Banks

Jean-Edouard Colliard and Denis Gromb

HEC Paris

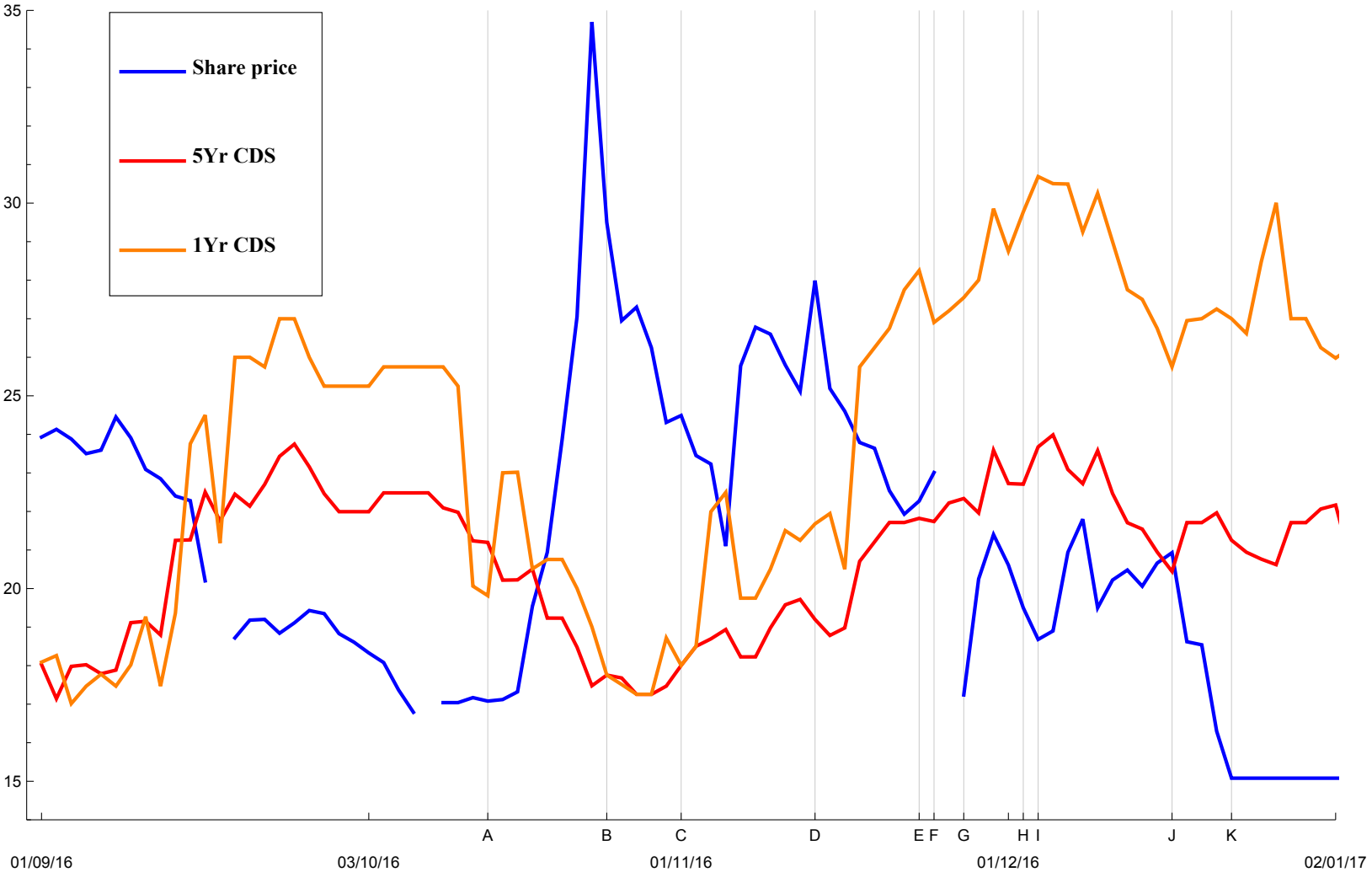
Naples
December 15, 2017

Roadmap

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



The main idea

1. Why are private restructurings long and inefficient?

- Asymmetric information over assets $\Rightarrow$ Delay as signal
- Externality on gvt: Lower bail-outs and social costs of default

2. Impact of a tougher resolution regime (i.e. lower bailouts)?

- Surplus effect $\Rightarrow$ Delay $\searrow$
- Signaling effect $\Rightarrow$ Delay $\nearrow$

3. Implications for resolution design?

- Optimal bail-out trades off both effects (tougher $\neq$ better)
- Government direct involvement in negotiations?

Roadmap

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 increases to $(p + m)$
- Debt overhang problem:
  - Denote $X = Z - D$

$$mX > c \qquad \text{but} \qquad m(X - R_0) < c$$

  - $\Rightarrow$ Gains from bargaining

Restructuring/Resolution

- 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 βdt
- 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 $h \Rightarrow$ Gvt pays $(1-h)R$
  - Shareholders get 0

Roadmap

Payoffs

- In status quo, shareholders and creditors obtain:

$$\begin{aligned} S_0(p) &= p(X - R_0) \\ C_0(p) &= [1 - h(1-p)]R_0 \end{aligned}$$

- Asymmetric information $\Rightarrow$ Creditors' belief $\hat{p}$ is important
- For a given belief $\hat{p}$, creditors accept a write-down of:

$$R_0 - R(\hat{p}) = \frac{mh}{1 - (1 - \hat{p} - m)h} R_0$$

- $\Rightarrow$ Manager wants to convey p is low to get larger write-down

Equilibrium

- Post-restructuring payoffs:

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

- Delay as signal
  - Bank with asset quality p offers $R(p)$ after delay $\Delta(p)$
  - Higher asset quality $p \Rightarrow$ Default is less likely
    $\Rightarrow$ Write-down more valuable $\Rightarrow$ Delay is more costly

- Separating equilibrium: Shareholders' expected payoff $U(t, p)$ should be max in $t = \Delta(p)$

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

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 Δ to signal
- Surplus effect
  - Delay decreases with total bargaining surplus

$$S(x,x) + C(x,x) - S_0(x) - C_0(x)$$

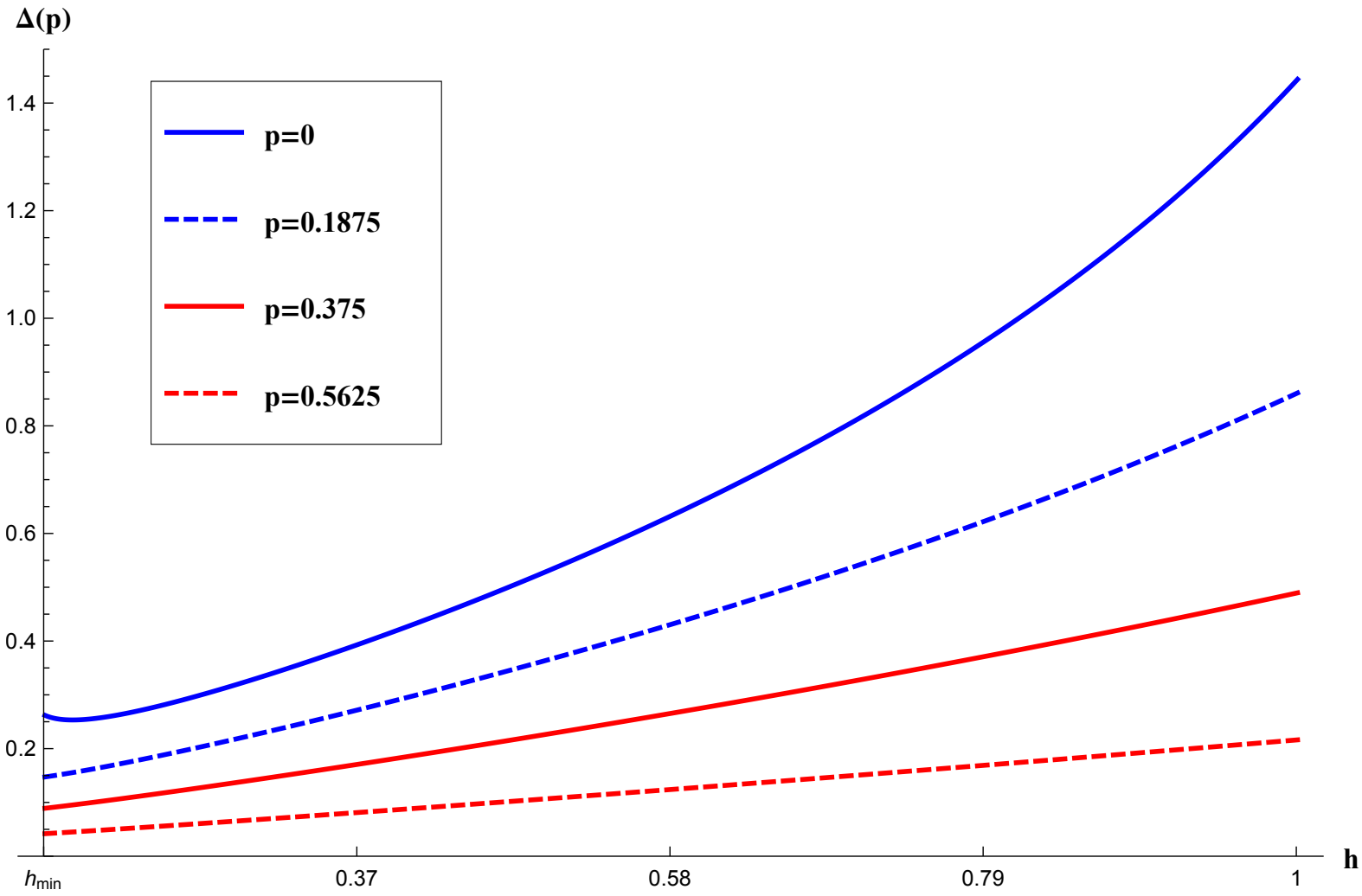
  - $\Rightarrow$ Higher cost of breakdown $\Rightarrow$ Shorter Δ to signal

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 $\Rightarrow \Delta \searrow$
- Signaling effect
  - Less bailout $\Rightarrow$ Creditors lose more w/o restructuring
  - Willing to concede larger write-offs
  - $\Rightarrow$ More gain from pretending p is low $\Rightarrow \Delta \nearrow$

Corollary

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


Δ(p)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
p=0
p=0.1875
p=0.375
p=0.5625
h
h_{min}
0.37
0.58
0.79
1

Optimal haircut

- Optimizing haircut:
  - Avoid creditor loss which have social cost η (e.g. systemic risk)
  - Private restructuring with shorter delays or larger write-offs

- For a given p, the government's ex post cost is:

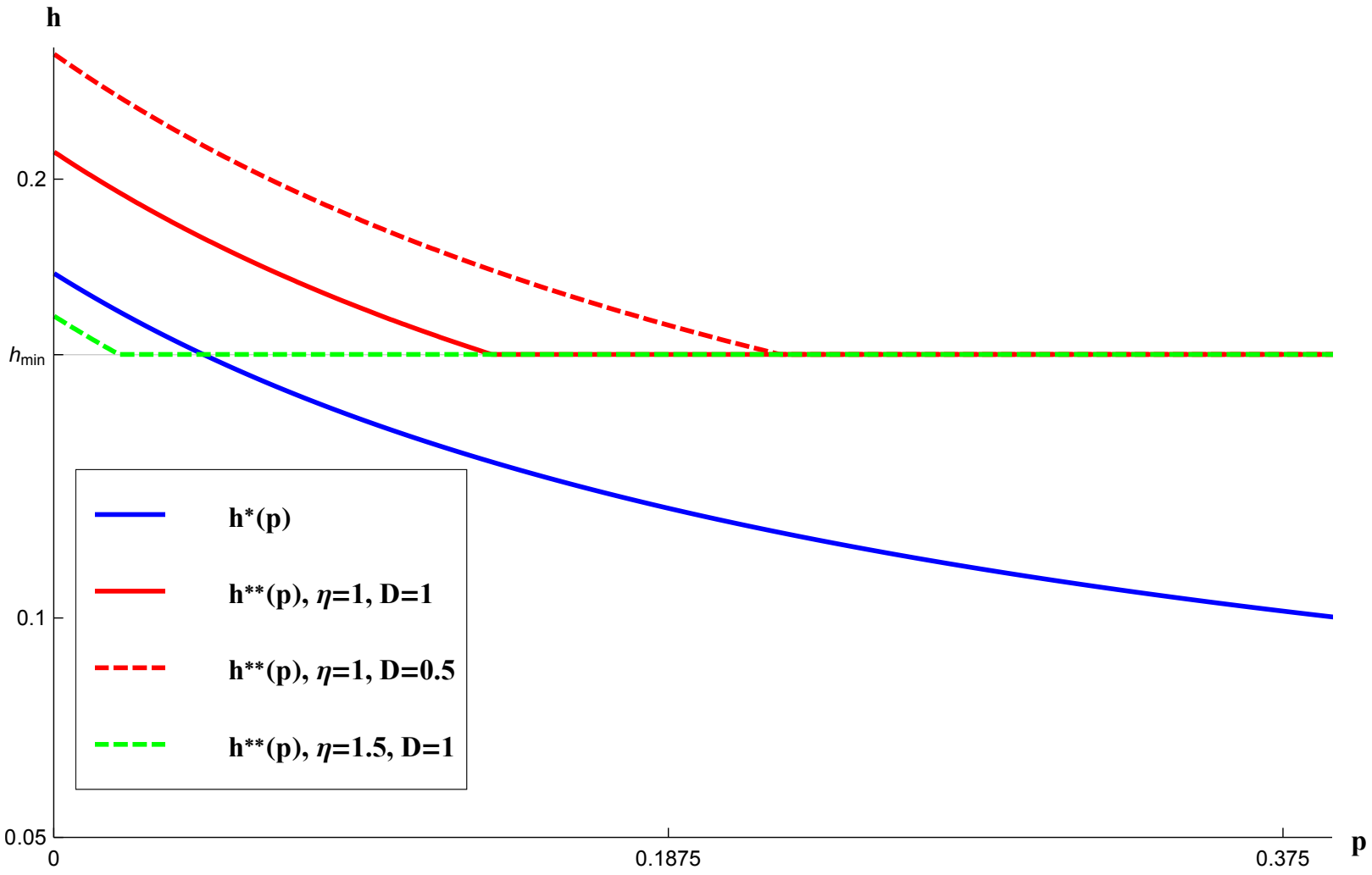
$$D + (1 - h)R + \eta hR$$

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



Roadmap

Government involvement in negotiations

- The problem is partly the externality on the government
- The government could subsidize the bank to restructure debt, which reduces Δ (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 delay

Intuition:

- Surplus effect: gvt involvement makes the manager internalize impact on the deposit insurance fund $\Rightarrow$ Shorter Δ
- Signaling effect: even more incentives to pretend the bank's quality is low to extract larger subsidies $\Rightarrow$ Longer Δ

Roadmap

Conclusion

- Step towards analyzing complex distressed bank restructurings
  - w/o frictions, efficient restructuring (Haugen-Senbet (1978))
  - Frictions: Asymmetric information (e.g. Cramton (1984)) and externalities (e.g. Jehiel-Moldovanu (1995))
- Very stylized model, highlighting two general effects:
  - Surplus effect: more to gain fosters restructuring
  - Signaling effect: information-sensitivity hinders restructuring
- Optimal resolution framework must trade-off these two effects as well as ex-post efficiency
- Relevant for banks... but not only (Alitalia, Greece)