Financial Restructuring and Resolution of Banks

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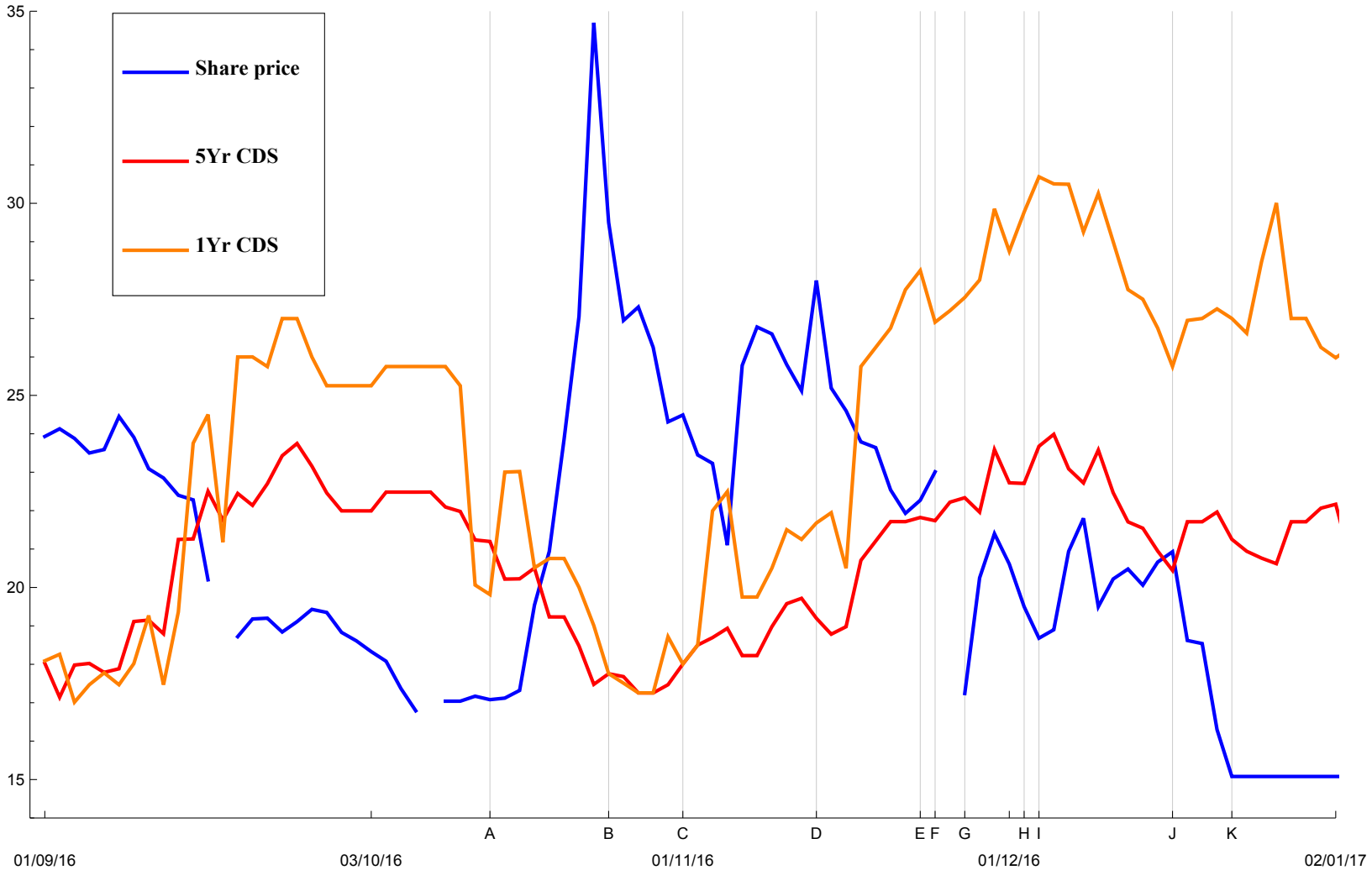
Roadmap

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

How does resolution affect private restructuring?

1. Why are private restructurings long and inefficient?
   - Asymmetric information over assets $\Rightarrow$ delay as a signal
   - Renegotiation benefits the government $\Rightarrow$ externality
2. Impact of tougher resolution regimes (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)
   - Direct government involvement in negotiations?

Related literature

- Recent models of resolution: Landier and Ueda (2009), Keister and Mitkov (2016), Walther and White (2016), Bolton and Oehmke (2016).
- Policy-oriented papers: Dermine (2016), Gracie (2016), Huertas (2016), Philippon and Salord (2017)...
- Other forms of crisis resolution: Gorton and Huang (2004), Diamond and Rajan (2005), Philippon and Skreta (2012), Tirole (2012), Acharya and Yorulmazer (2008), Perotti and Suarez (2002), Philippon and Schnabl (2013)...
- Corporate finance: Bulow and Shoven (1978), Gertner and Scharfstein (1991), Kahl (2002)...

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 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. 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:

$$\begin{aligned} S_0(p) &= p(X - R_0) \\ C_0(p) &= pR_0 + (1-p)(1-h)R_0 \end{aligned}$$

- Asymmetric information $\Rightarrow$ Creditors' belief $\hat{p}$ is important
- For a given belief $\hat{p}$, creditors accept $R(\hat{p})$ such that:

$$\begin{aligned} & C_0(\hat{p}) = (\hat{p}+m)R(\hat{p}) + (1-\hat{p}-m)(1-h)R(\hat{p}) \\ \Leftrightarrow \quad & R_0 - R(\hat{p}) = \frac{mh}{1-(1-\hat{p}-m)h} R_0 \end{aligned}$$

Manager wants to convey that p is low to get a write-down

Equilibrium - 1

- 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 a signal: higher asset quality $p \Rightarrow$ default is less likely $\Rightarrow$ write-down more valuable $\Rightarrow$ delay is more costly

Equilibrium - 2

- 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 $t = \Delta(p)$:

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

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

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

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

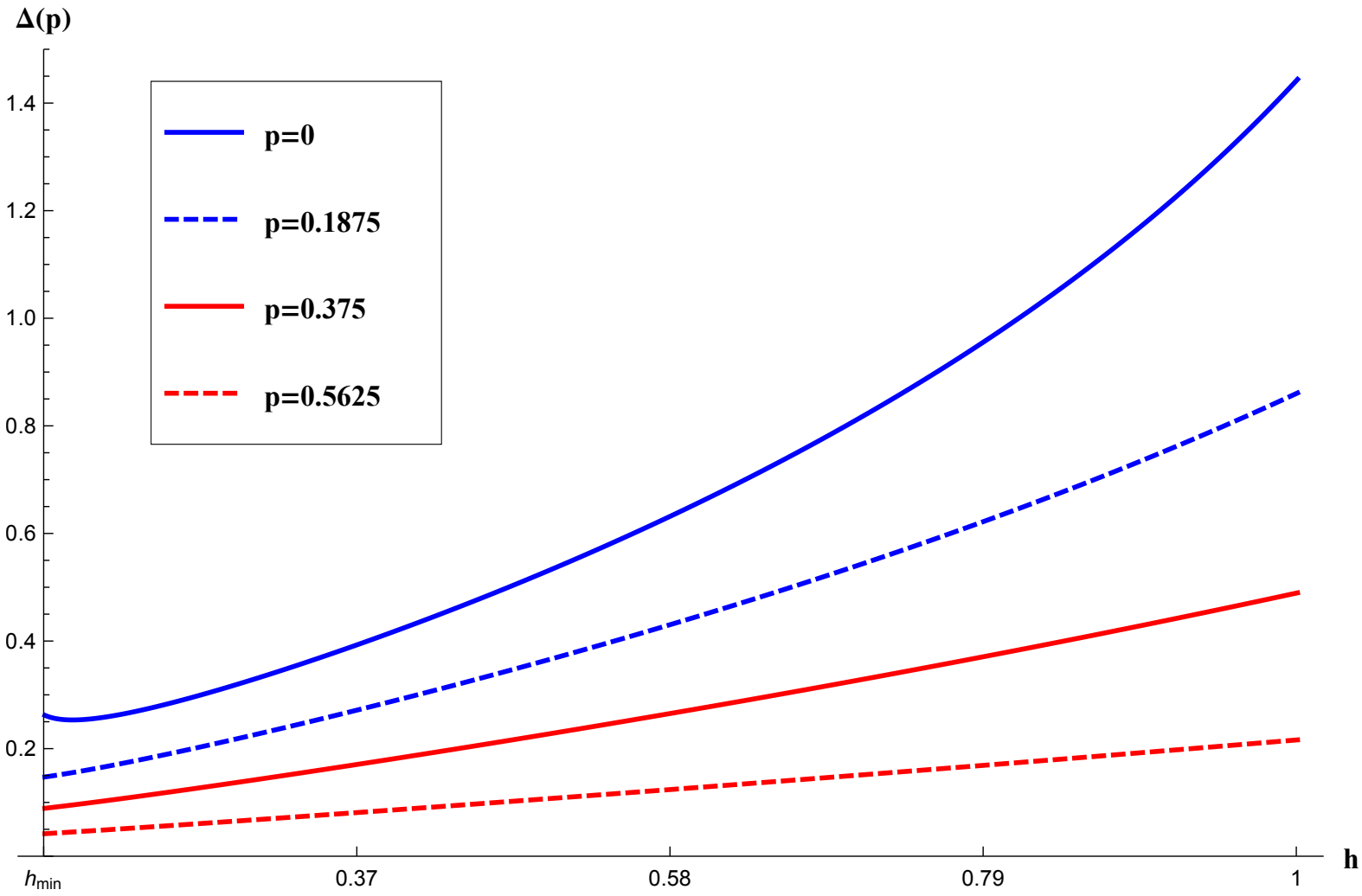
  - Higher cost of breakdown $\Rightarrow$ shorter Δ

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-downs $\Rightarrow$ higher gain from pretending p is low $\Rightarrow \Delta \nearrow$

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.


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

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

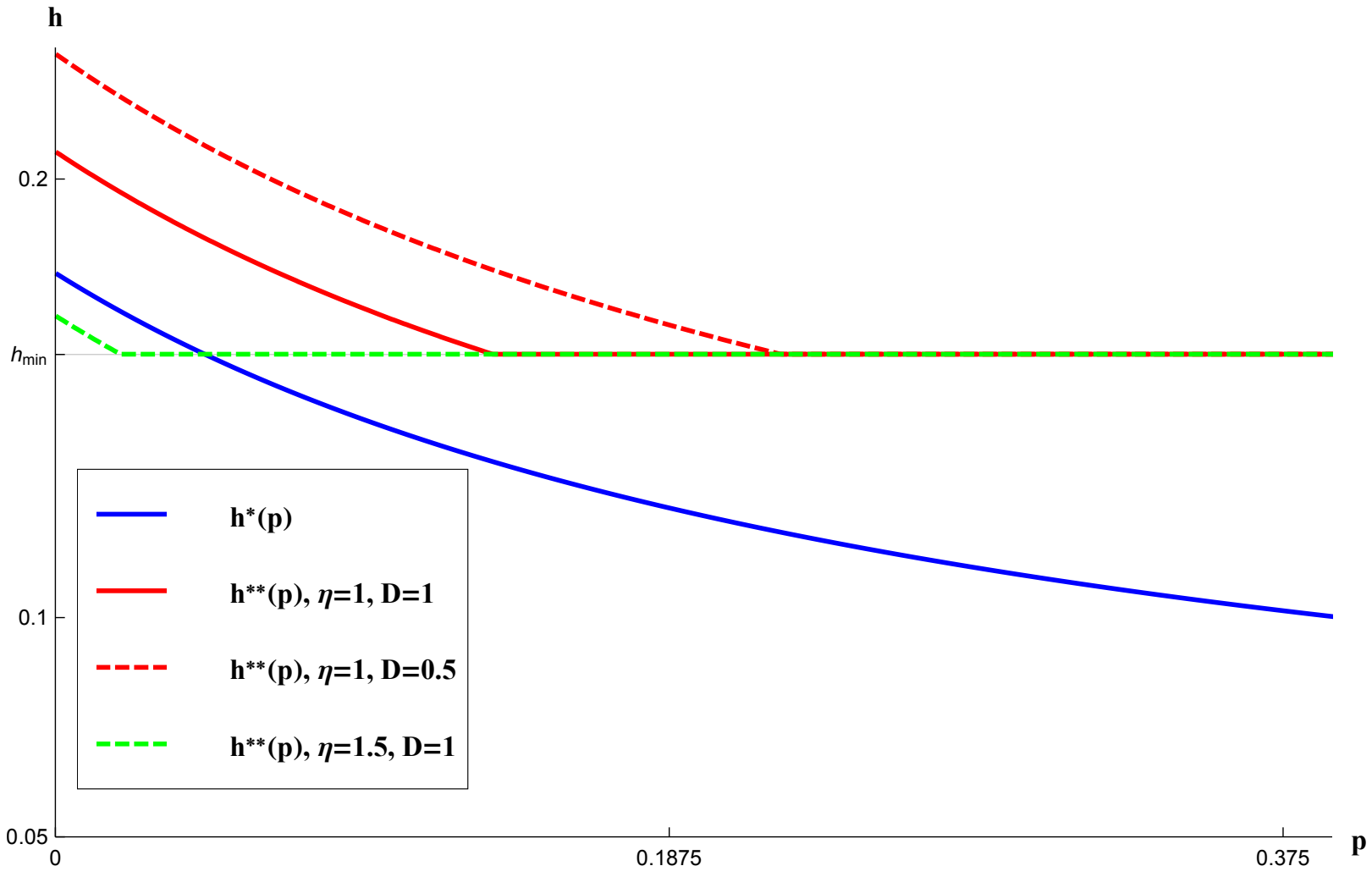
$$D + (1 - h)R + \eta hR$$

- 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



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

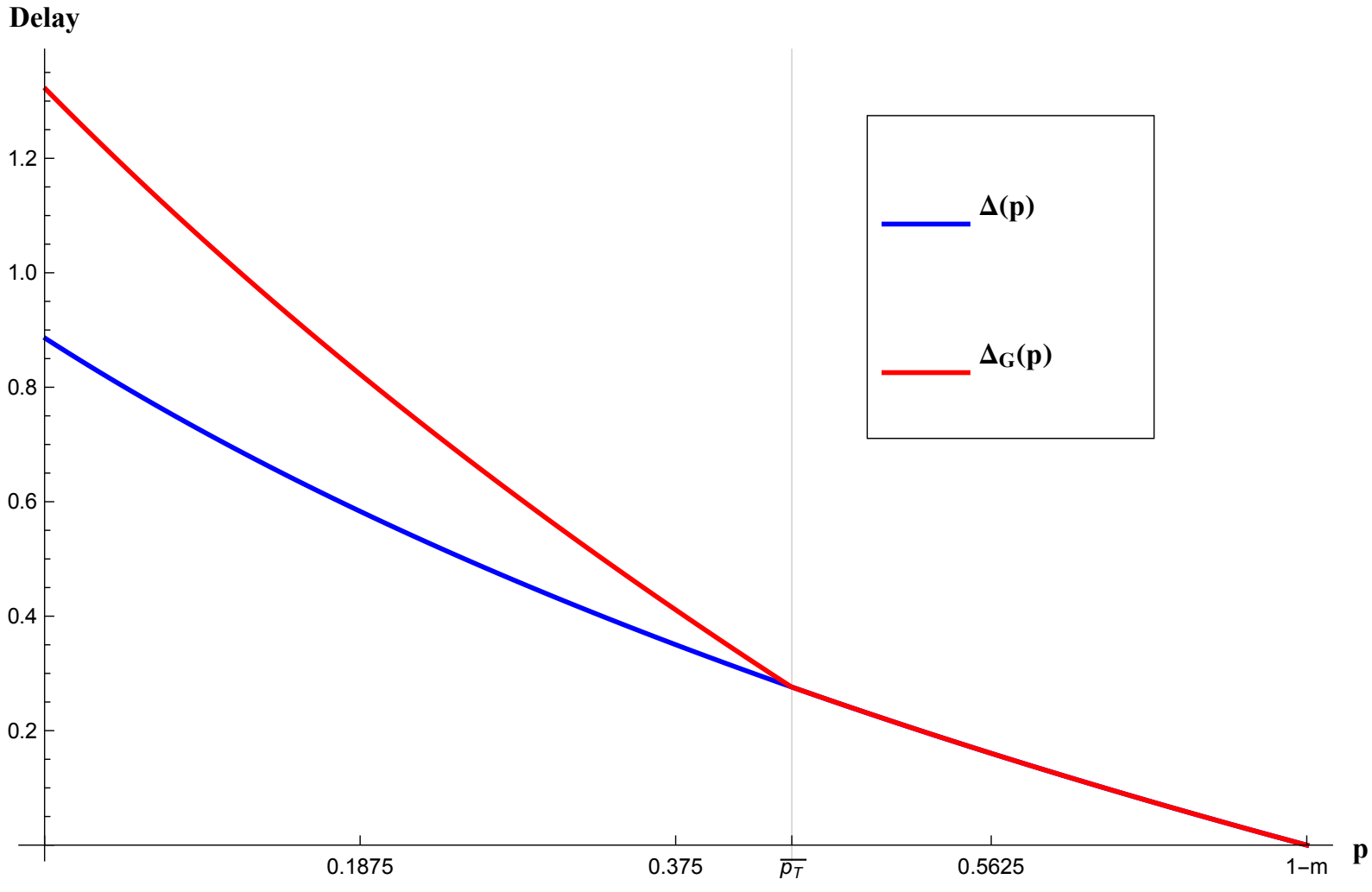
Corollary

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

Intuition:

- Surplus effect: gvt. involvement makes the manager internalize the 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

Example


Delay
1.2
1.0
0.8
0.6
0.4
0.2
0.1875
0.375
$\overline{p_T}$
0.5625
1–m
p
Δ(p)
Δ_G(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.

Roadmap

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!

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