# Collateral matters: Liquidity injection policies and fire sales

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### **SUMMARY**

Liquidity injection through secured lending (i.e. repo) limits liquidation of the securities used as collateral. Relative to unsecured lending this:

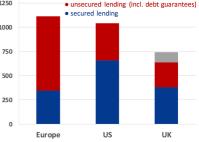
- Reduces fire sales in securities markets, preserving banks' and other entities' capital (Graph 1).
- Forces banks to borrow more, which makes penalty rates more effective for deterring liquidity risk taking.

A securities purchase policy that ex-ante promises minimal intervention may induce low risk taking, but it lacks credibility.

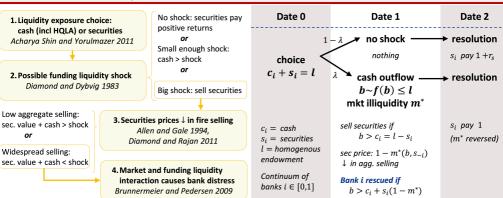
Disciplinary lending policies have more credibility if the repayments occur after the stress subsides.



Size and composition of 2008 liquidity injections



## FOUR MODEL INGERDIENTS, TIMELINE AND EXPECTED PROFITS



**EXPECTED PROFITS**  $\Pi_i(s_i, s_{-i}) = \text{returns if no shock} + \text{returns if survivable shock}$  $+\lambda * pr[distress] * E_b[liquidity deficit * value of liquidity | distress]$  $b+s_im^*-l$ determined by policy  $b>l-s_im^i$ 

Role of policy: Marginal cost (MC) of liquidity exposure given distress:  $d\Pi_i$ 

 $= -m^* \times \text{value of liquidity}$  $\overline{ds_i}\big|_{b>l-s_im^*}$ 

#### THREE POLICIES AND THEIR RESULTS

## 1. Unsecured lending:

• Definition: If bank borrows X at date 1, repays  $X(1+r^U)$  at date 2

### **RESULT 1: Penalty rates**

High enough  $r^U$  relative to  $m^* \Leftrightarrow$ decreasing returns to liquidity risk.

· Discussion: Marginal cost of illiquidity conditional on no rescue is determined by  $m^*$ . If greater than conditional on rescue, ex-ante MC is reduced by raising rescue probability

## 2. Secured lending:

**Definition**: If bank borrows X at date 1, provides X/(1-h) securities as collateral, repays  $X(1+r^R)$  at date 2

#### **RESULT 2A: Penalty effectiveness** If $r^U = r^R$ and liquidity risk is DRTS then secured lending has lower eq. liquidity risk than unsecured lending.

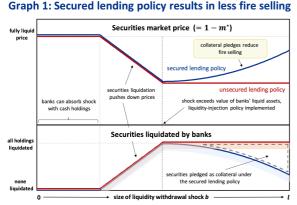
· Discussion: Secured lending forces more borrowing and less selling. If  $r^{\it R}$ is high enough then this is costly

## **RESULT 2B: Fire sales and capital**

If policies 1 and 2 give same eq. risk then secured lending gives banks higher profits.

• **Discussion:** Higher  $s_i \rightarrow \text{bank } i$  posts more collateral given a crisis → sells fewer securities  $\rightarrow$  cares less about  $m^*$  $\Rightarrow$  MC of illiquidity uncoupled from  $m^*$ 

Collateral requirement implies  $m^{R*} < m^{U*}$  at high b (Graph 1). ⇒ raises profit without lowering MC of illiquidity



## 3. Securities purchases:

• Definition: Authority buys securities until illiquidity  $m^* \leq m^S(b)$ . Targets  $\bar{S}$  s.t.  $m^S(b)$ saves banks with  $s_i \leq \bar{S}$ 

#### **RESULT 3: Policy credibility**

A higher equilibrium exists than under unsecured lending (w penalty rates). All lower eq. are not credible (i.e. subgame

· Discussion: Authority can potentially induce equilibria at  $s_i = \bar{S}$  where banks cannot fail. However, if banks raise  $s_i$  then  $\bar{S}$  must rise

 $\operatorname{High} r$  in lending policies is more credible if interest is repaid after the stress subsides

→ Farhi and Tirole 2012 result less applicable for lending policies when banks' capacity to repay increases after the crisis