Optimal Regulation of Credit Lines

Jose E. Gutierrez

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- Despite their importance, the literature on CLs is relatively scarce

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  - → Funds are drawn down even though they are still not needed

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- Bank regulation
  - → Perotti and Suarez (2011), Stein (2012), Gersbach and Rochet (2012), Segura and Suarez (2017), Kara and Ozsoy (2010)

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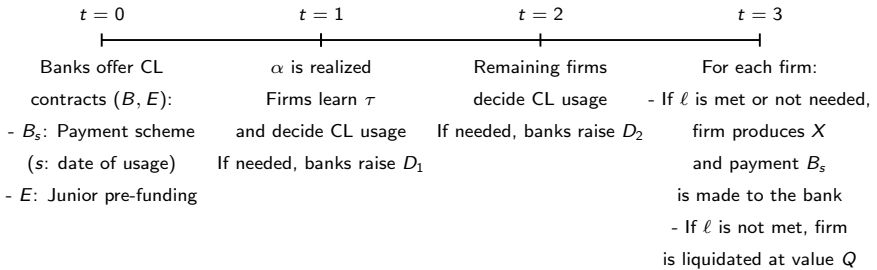
- At $t = 1$, the fraction α of firms in need of funds is publicly revealed
  - $\rightarrow$ Firms privately learn at $t = 1$ whether and when cash will be needed

Sequence of events



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- Firms' demand for liquidity will be equal to $\alpha \equiv \alpha_1 + \alpha_2 \leq 1$
- **Simplification:** $\alpha_1 = 0$ and $\alpha = \alpha_2 \sim f(\cdot)$ is publicly revealed at $t = 1$

Firms (II)

- At $t = 3$, the firm produces a cash flow

$$\tilde{x} = \begin{cases} X, & \text{if not liquidated,} \\ Q(z), & \text{if liquidated,} \end{cases}$$

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- Access to an alternative investment that yields a private return $\rho < 1$

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A1. Continuation return $>$ Liquidation return

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A3. Firms in need of funds prefer investing funds in the project over investing them at ρ

$$\rho < X - Y$$

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  - $\rightarrow$ The bank commits to raise pre-arranged funding per committed funds equal to E and invest it in cash at $t = 0$
  - $\rightarrow$ Pre-arranged funding E is junior to funding raised at $t = 1, 2$ (e.g., LT debt or equity)

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- Junior pre-funding E helps to sustain lending over a wider range of α's
  - $\rightarrow$ Claims associated to E can be diluted to raise additional funds at $t = 1, 2$
  - $\rightarrow$ Yet, pre-funding E demands a higher return

Solving for the unregulated CL contract

The representative bank's problem:

• **Given aggregate liquidations $z(\alpha)$**, the expected payoff of the representative firm is maximized subject to

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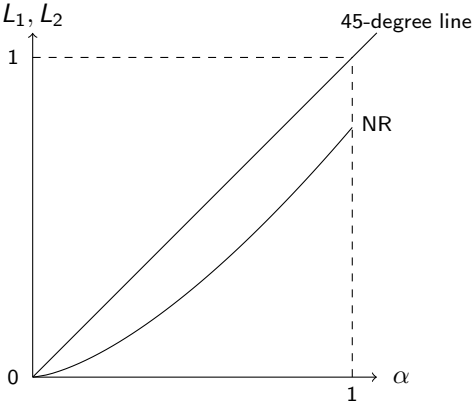
(+) Symmetric eq. can fully characterize the unregulated CL (B^U,E^U)

CL performance given (B, E) for every α



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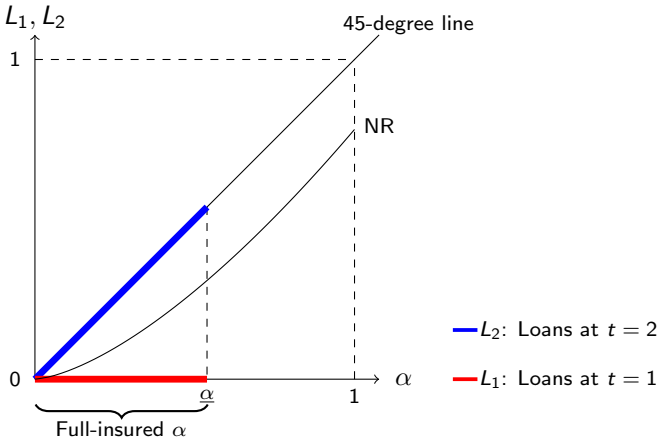

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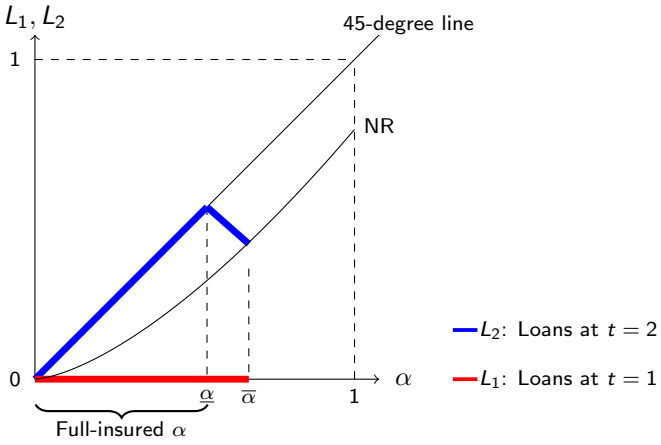

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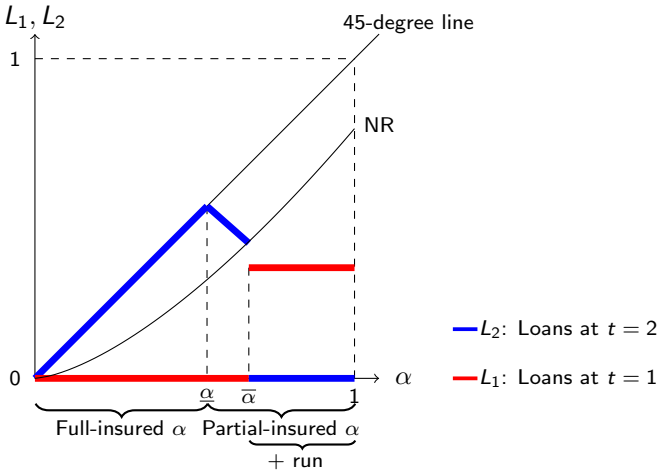

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- If high realizations of α are rare, E is optimally chosen s.t. the unregulated CL contract features liquidations & runs
- Banks do not internalize the effect of liquidations on eq. liquidation values
  - $\rightarrow$ Scope for regulation

Solving for the constrained efficient CL contract

The social planner's problem:

- The expected payoff of the representative firm is maximized subject to
  1. Some incentive compatibility constraints that prevent opportunism
  2. The participation constraint of investors who provide E
  3. **Aggregate liquidations**

Constrained efficient CL contract

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- Socially desirable to increase $E > E^U$

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→ A reduction in the occurrences of CL runs

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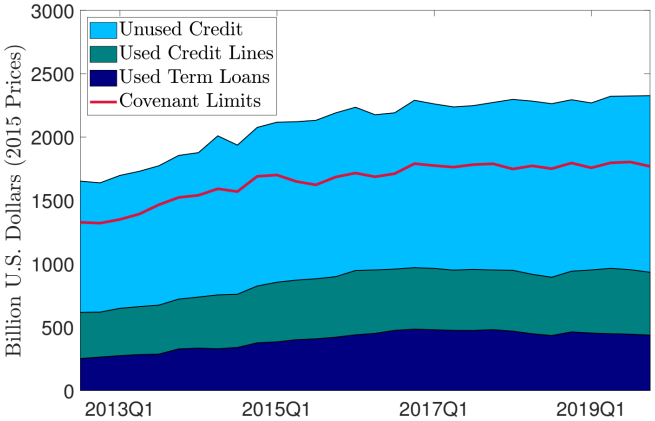
Appendices

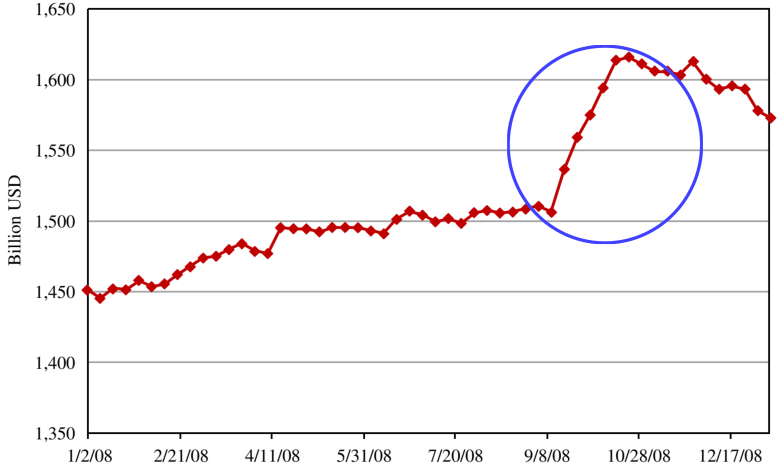
Aggregate Term Loans and Credit Lines in the U.S.



Source: Greenwald, Krainer, and Paul (2020)

go back

Commercial and Industrial Bank Credit in the U.S.



Source: Ivashina and Scharfstein (2010)

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