Financial Market Structure and the Supply of Safe Assets: An Analysis of the Leveraged Loan Market

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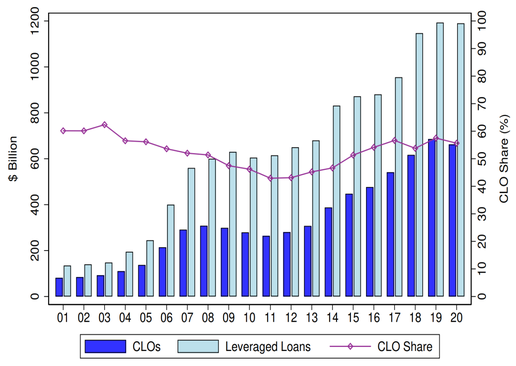
Institutional Background

Safe assets: debt with very low probabilities of default, typically priced at a "safety premium".

Leveraged loans: large speculative-grade corporate loans.

Collateralized loan obligations (CLOs): financial intermediaries that issue safe and risky securities backed by leveraged loans.

Non-securitized lenders: intermediaries that also hold leveraged loans but do not create safe securities, e.g., mutual funds sand hedge funds.



Market structure:

CLOs and non-securitized lenders coexist

- Similar assets, but distinct liabilities

Both groups trade loans in the secondary market

- Loan shares change hands over time as the economy evolves

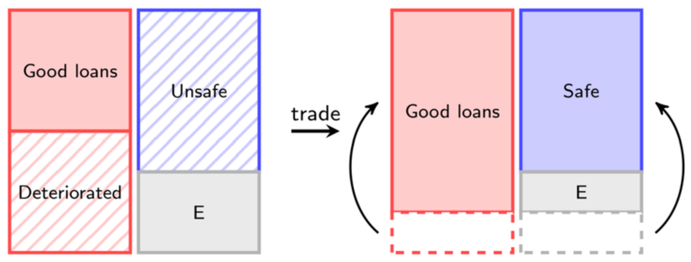
Basic Insight

CLOs' key innovation: dynamic collateral management

- The securities are backed by a loan portfolio that is actively managed
- Unlike traditional securitization with static collateral, e.g., RMBS

Benefit: a larger safe (AAA-rated) senior tranche, thus lower a financing cost

- The quality of loans might deteriorate in bad times
- Selling deteriorated loans and buying less risky loans reduce the uncertainty of the portfolio's subsequent cash flows, which protect senior tranche
- Promising to do this ex post allows for greater safe debt capacity ex ante



The Idea in Practice

Why would debt investors believe the CLO manager's promise?

- CLO contracts, enforced based on individual loan ratings, obligate managers to replace deteriorated loans

Who trade loans with CLOs as counterparties?

- Non-securitized lenders. They hold loans but have no obligation to maintain portfolio quality.

Do CLO managers trade as promised?

- Empirically, CLOs' secondary market trades in response to the COVID-19 crisis in 2020 offset roughly 60% of collateral deterioration relative to counterfactual portfolios.

Research Questions

1. How does the dynamic trading of the underlying loans change the market's overall supply of safe assets?
2. Is this private debt market efficient?
3. How does regulation affect the market?

To answer these questions, need to jointly analyze

- An intermediary's lending, financing, and secondary market trading decisions
- Secondary market demand and supply aggregate quantities
- Loan prices, which matter for how many good loans CLOs can buy after selling bad loans

Model Overview

An Equilibrium Model of Securitized Lending: simple framework for analyzing the market

Investors

- Endowed with goods but cannot directly lend to firms
- Price-taking and derive utility $\gamma > 0$ from holding safe assets

A continuum of asset managers $i \in [0,1]$ can lend to firms

- Must raise financing, i.e., issuing any equity and debt securities, including safe debt a_i
- Key concern: everyone's loans might deteriorate in bad times
- Can credibly promise to replace deteriorated loans through secondary market trading

Investment technology

- Each manager originates risky loans with quantity x_i
- Marginal cost of investment $c'(x_i)$ is increasing

Timeline: $t \in \{0,1,2\}$

- $t = 0$: managers make lending and financing choices, and investors buy securities
- $t = 1$: a macro shock may cause a fraction of loans to deteriorate and become riskier, and intermediaries trade loans in the secondary market
- $t = 2$: loan payoffs realize, managers pay investors and receive residual

Equilibrium

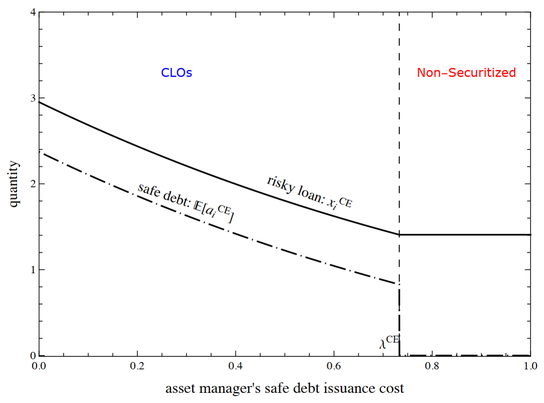
- Given loan prices, every manager chooses lending and financing at $t = 0$ maximize the expected payoff to the intermediary's internal equity
- Given loan prices, every manager trades at $t = 1$ to maximize conditional expected equity payoff, subject to its promise made at $t = 0$
- Loan prices clear the secondary market

Market Structure

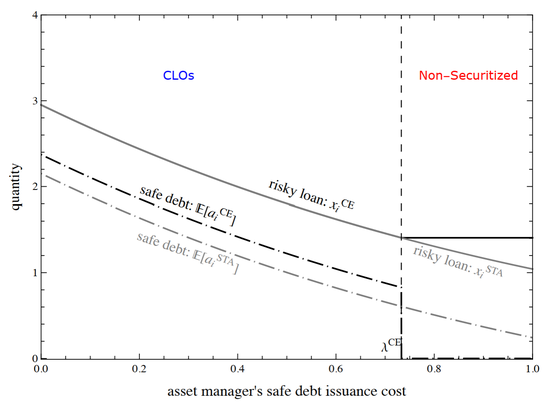
The manager's tradeoffs: Intuition

- Liability side: issuing safe debt provides cheap financing
  - Promising to replace deteriorated loans in bad times allows for more safe debt today
- Asset side: lending choice depends on endogenous secondary market prices
  - When many managers exploit safe debt, they generate large price pressure in bad times, making it profitable to trade as counterparties
- If managers face heterogeneous costs of issuing safe debt (i.e., some intermediaries have better technology to securitize loans than others), there is a unique competitive equilibrium

The market structure is endogenous



Proposition 1: *In equilibrium ("CE"), a subset of managers promise to maintain collateral quality and fully use safe debt capacity ("CLOs"), and other managers do not issue any safe debt ("non-securitized lenders").*

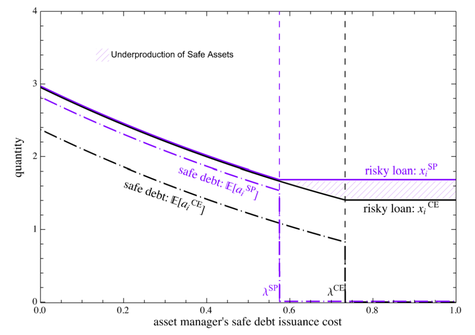


Compare with Static Securitization ("STA"):

- Non-securitized lenders lend more and profit from secondary market trading.
- The increase in total loans allows CLOs to create more safe assets than in static securitization.

Welfare Analysis

Compare with A Planner's Allocation ("SP")



Proposition 2: *Equilibrium is inefficient: there is excessive entry into operating CLOs ($\lambda^{CE} > \lambda^{SP}$), and the market underproduces safe assets ($\int a_i^{CE} < \int a_i^{SP}$).*

Source of inefficiency

A pecuniary externality: individual managers fail to internalize the effect of their lending and financing choices on secondary market loan prices.

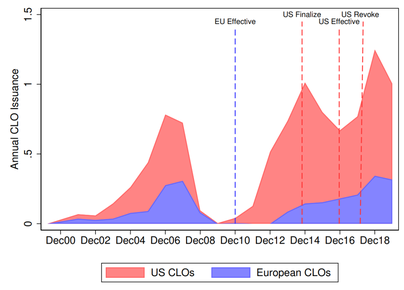
- Liability side: CLOs' binding collateral constraints are tightened by secondary market prices.
- Asset side: non-securitized lenders underinvest, causing a shortage of total collateral.

Regulation

Impose an entry cost to reduce CLOs?

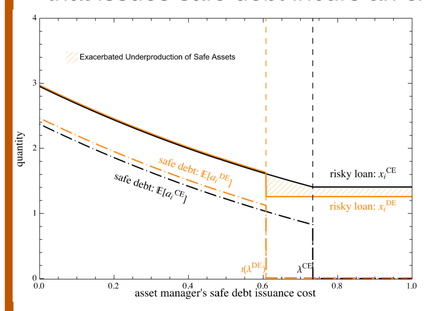
The US Credit Risk Retention Rule (2014-2018) effectively did this to the CLO market.

- Controversy, lawsuits, and its revocation.



How does the policy move the equilibrium?

Introduce the policy into the model: any manager that issues safe debt incurs an exogenous cost



Proposition 3: *An entry cost policy ("ECP") reduces the fraction of CLOs, allows the remaining CLOs to issue more safe debt, but worsens the underproduction of safe assets.*

Reducing excessive entry into operating CLOs worsens the market through an equilibrium effect.

- Less price pressure implies lower profits for non-securitized lenders, who optimally respond by lending less.
- This further reduces the collateral available to CLOs in the secondary market.

Takeaways

Promising to dynamically maintain collateral quality allows CLOs to issue larger safe tranches ex ante.

- Lowers financing costs when investors (e.g., banks) demand safe assets (e.g., AAA-rated securities)

But if many CLOs do so, their price pressure makes replacing bad loans costly and selling good loans profitable.

- Feedback from secondary market prices to intermediary balance sheets and market structure

Intermediaries with two types of liabilities coexist, and the market produces more safe assets than in static securitization.

- A unique market-based safety transformation

The competitive equilibrium may not be socially optimal

- Price pressure tightens CLOs' binding collateral constraints

This endogenous market structure presents new policy challenges

- Correcting only one side of the intermediary balance sheet worsens the other side
- The Credit Risk Retention Rule can exacerbate the inefficiency