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

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## Institutional Background

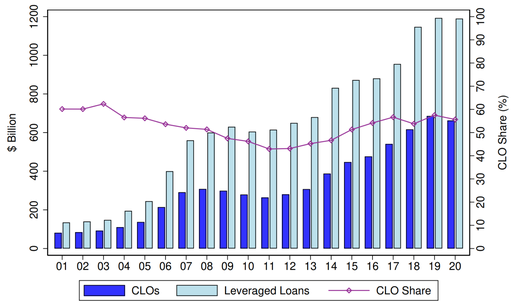
**Safe assets**: debt with very low probabilities of default, typically priced at a "safety premium".

**Leveraged loans**: large-sized 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.

Growth of the market, 2001-2020:




**Market structure**:

CLOs and non-securitized lenders coexist

- Similar assets, distinct liabilities

Both groups trade loans in the secondary market

- Loan shares change hands over time as the economy evolves

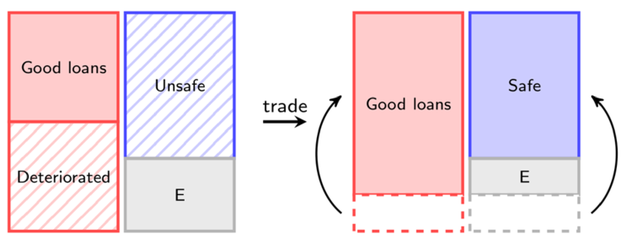
## Basic Insight

**CLOs' key innovation**: dynamic collateral management

- The securities are backed by a loan portfolio that is actively managed
- Contrast to traditional securitization based on static collateral, e.g., RMBS

**Benefit**: a larger safe (e.g., 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.

## 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, we need to endogenize prices and quantities

- Secondary market must clear
- Loan prices matter for how many good loans CLOs can buy after selling bad loans
- Intermediary lending, financing, and secondary market prices jointly determined

## Model Overview

**An Equilibrium Model of Securitized Lending**: a simple analytical framework

*Investors*

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

*A continuum of asset managers $i \in [0,1]$ who 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*

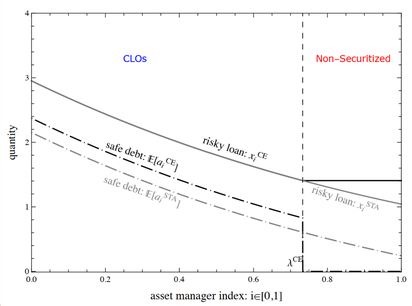
- Each manager originates risky loans with quantity $x_i$
- Marginal cost of investment $c'(x_i)$ is increasing

*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

**Intuition: the manager's tradeoffs**

- 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

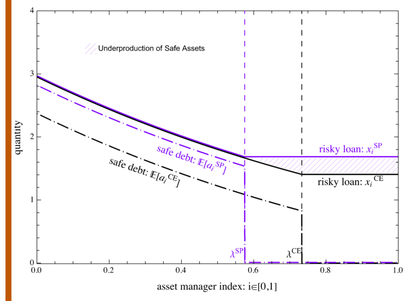



**Proposition 1**: *a fraction of managers promise to maintain collateral quality and fully use safe debt capacity ("CLOs"), other managers do not issue any safe debt ("non-securitized lenders").*

The market structure is endogenous.

**Value of loan trading**: Non-securitized lenders lend more than in static securitization and profit from trading. The increase in total loans allows CLOs to create more safe assets than in static securitization.

## Welfare and Regulation



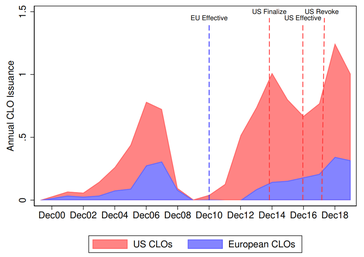

**Proposition 2**: *equilibrium is inefficient. There is excessive entry into operating CLOs, and the market underproduces safe assets.*

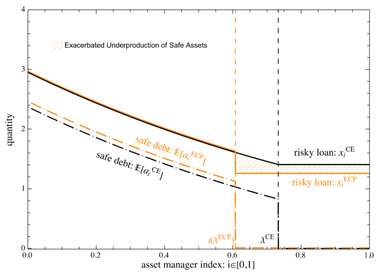
Source of inefficiency is a pecuniary externality: managers only care about their own payoffs given prices. Too much price pressure constrains CLOs.

Impose an **entry cost policy** to correct the inefficiency?

The Credit Risk Retention Rule (2014-2018) effectively did this to CLOs. Caused controversy, lawsuits, and its revocation.

How does an entry cost affect the model's equilibrium?




**Proposition 3**: *the entry cost policy mitigates the price pressure but exacerbates the underproduction of safe assets.*

Equilibrium effect: less price pressure implies lower profits for non-securitized lenders, who optimally respond by lending less. This further reduces total collateral available to CLOs.

## Takeways

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 intermediaries do so, the 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 distinct 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

Endogenous market structure presents new policy challenges

- Correcting only the asset/liability side worsens the other side
- The Credit Risk Retention Rule can exacerbate the inefficiency