
Did the rise of CLOs lead to riskier lending?

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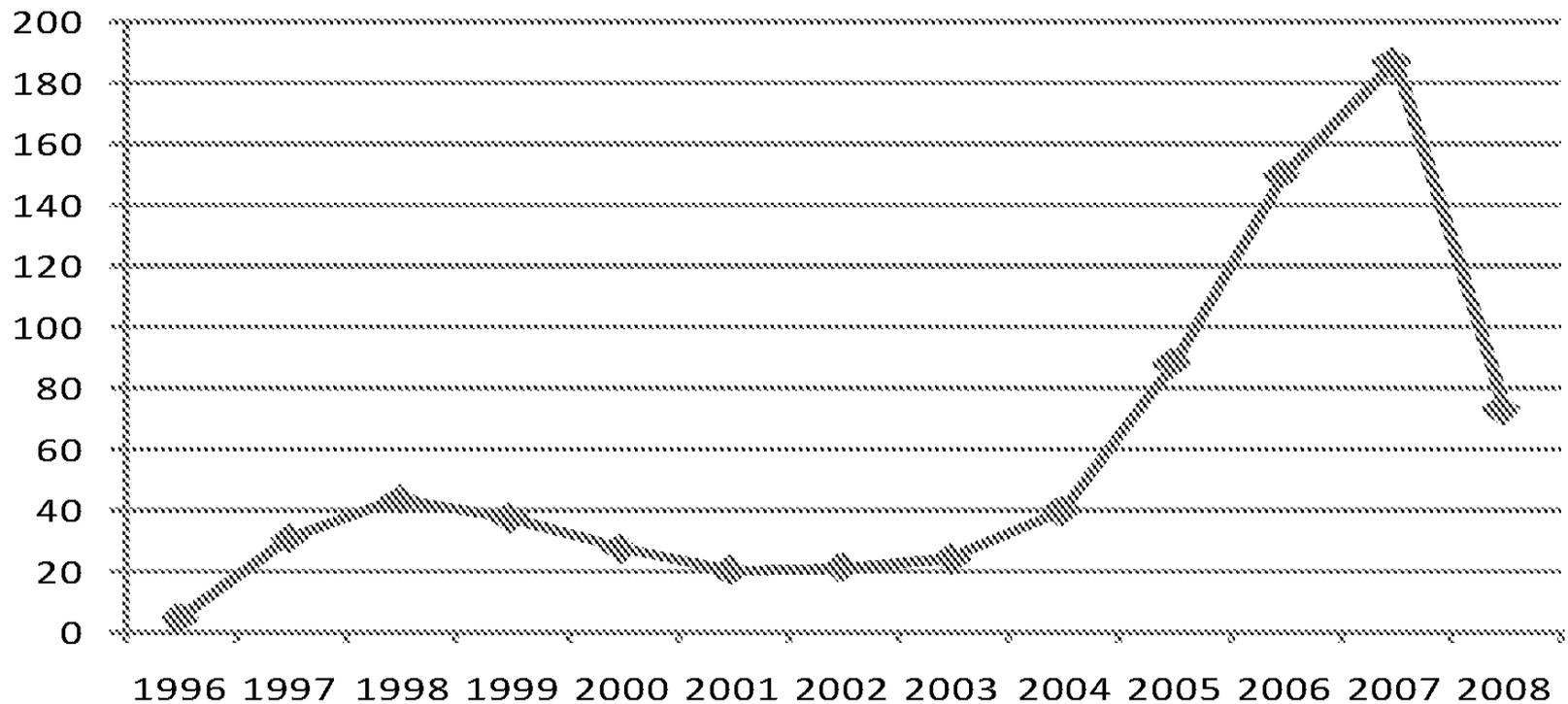
Motivation

- Securitization adversely affected the screening incentives of mortgage lenders, contributing to a large increase in mortgage delinquencies.
 - Dell'Ariccia et al. (2008), Mian and Sufi (2008), Puranandam (2008) and Keys et al. (2008).
- Studies of corporate loans find no evidence that securitization led to poor quality loans.
 - Benmelech, Dlugosz, and Ivashina (2009), Shivdasani and Wang (2010), Wang and Xia (2010) finds mixed effects.
- Difference in these studies puzzling
- Mortgages are different from corporate loans, but securitization has similar effects on banks' screening and monitoring incentives in both markets

Motivation (cont.)

- Further, as with mortgages there was a rapid growth of loan securitization in the years leading up to the crisis.

Figure 1: Volume of CLOs originated by year (billions U.S. dollars)



Our objectives

- Investigate whether corporate loans that are sold to CLOs perform differently from non-securitized loans.
- Investigate whether banks' loan pricing policies reflect the expected performance of loans they sell to CLOs.
- Attempt to explain whether the difference in performance of these loans was due to a difference in
 - Ex ante screening
 - Ex post monitoring

Differences to existing studies

- Our measure of performance is loan specific
 - Existing studies rely on borrower measures of performance.
- We compare loans that are sold to CLOs with loans that the same bank originates but does not sell to CLOs
 - Shivdasani and Wang (2010) and Wang and Xia (2010) focus on leverage loans of banks that are heavily involved in securitization
 - Benmelech, Dlugosz, and Ivashina (2009) also focus on loans sold to CLOs, but in contrast to them:
- We focus on years of rapid growth of CLOs (2004-2008)
- We consider only credits sold to CLOs at origination
- We have a 3x larger sample of CLO credits
- We focus on within-bank effects

Sample: CLO credits vs non-CLO credits

	CLO credits	Non-CLO credits	Difference	T stat
NONACCRUAL YEAR 3	0.108	0.049	0.059	6.30***
AMOUNT	12.382	11.620	0.766	20.11***
MATURITY	6.021	4.237	1.788	37.26***
SPREAD	287.0	164.2	122.8	21.71***
SECURED	0.764	0.295	0.481	25.69***
DIVIDEND REST	0.449	0.327	0.146	6.84***
BBB	0.010	0.065	-0.055	14.02***
BB	0.101	0.043	0.057	6.34***
B	0.103	0.022	0.079	8.85***

Sample (Continued)

	CLO credits	Non-CLO credits	Difference	T stat
BK CREDIT EXP	0.544	0.912	-0.364	24.48***
BK CREDIT SH	0.091	0.263	-0.172	32.49***
MEDIAN CLO SH	0.021			
CLO SH	0.241			
MED PARTICIPANTSH	0.029	0.153	-0.124	65.76***
Observations	1176	7828		

Performance of loans sold to CLOs: Methodology

$$PERFORMANCE_{c,f,b,t+k} = c + \alpha \cdot CLO_{c,f,b} + \sum_{i=1}^I \beta_i X_{i,c,t} + \sum_{j=1}^J \gamma_j Y_{j,f,t} + \epsilon_{f,t}$$

Performance of loans sold to CLOs: Results

	Year 1	Year 2	Year 3
CLO	0.015**	0.030***	0.035***
LOAN CONTROLS	in	in	In
FIRM CONTROLS	in	in	in
YEAR DUMMIES	in	in	in
BANK FIXED EFFECTS	in	in	in
R squared	0.25	0.26	0.24
Observations	8966	8966	8966

Performance of loans sold to CLOs: Matching

	Year 1	Year 2	Year 3
CLO	0.012	0.038**	0.038**
R squared	0.29	0.32	0.30
Observations	596	596	596

Performance of loans sold to CLOs: Robustness tests

	Year 3				
CLO	0.035***	0.040***	0.039***	0.040***	0.086***
BK CREDIT SH		0.057***		0.057***	0.049**
BK BORROWER SH			0.059***		
MED CLO SH				-0.017	
CLO SH					-0.173***
R squared	0.24	0.24	0.24	0.24	0.24

Performance of loans sold to CLOs: Conclusion 1

Everything else equal, loans sold to CLOs at the time of their origination are more likely to default or become nonaccrual in the three years after origination

Spreads on loans sold to CLOs: Methodology

$$CSPREAD_{c,f,b,t} = c + \alpha \cdot CLO_{c,f,b} + \sum_{i=1}^I \beta_i X_{i,c,t} + \sum_{j=1}^J \gamma_j Y_{j,f,t} + \epsilon_{f,t}$$

Spreads on loans sold to CLOs: Results

	(1)	(2)	(3)	(4)	(5)
CLO	57.411***	54.532***	54.677***	53.858***	54.055***
BK CREDIT SH		-39.374**		-39.358**	-39.261**
BK BORROWER SH			-69.603**		
MED CLO SH				23.442	
CLO SH					1.834
R squared	0.61	0.61	0.61	0.61	0.61
Observations	4041	4041	4041	4041	4041

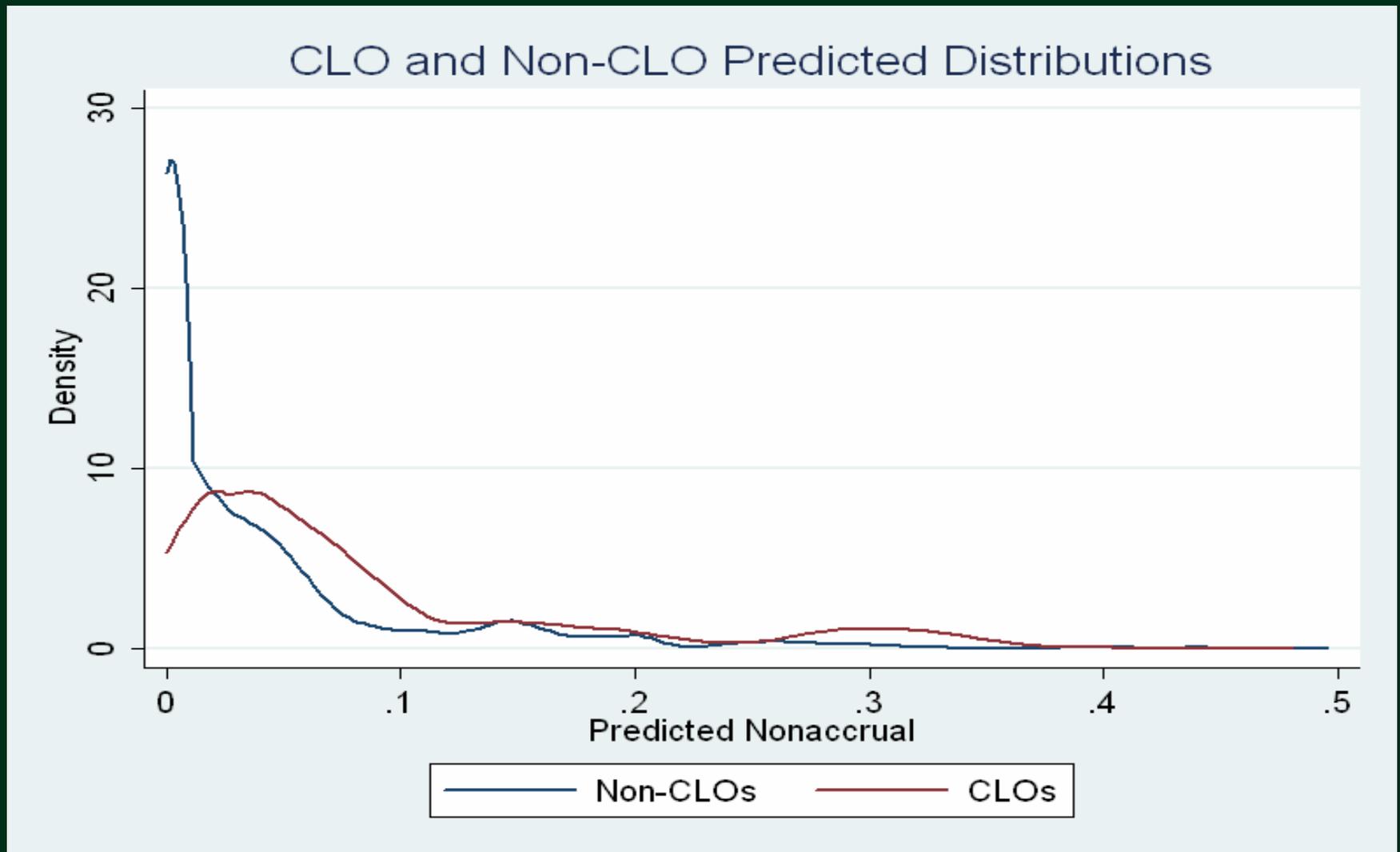
What drives CLO credits' interest rate premium?

Use a two-step test:

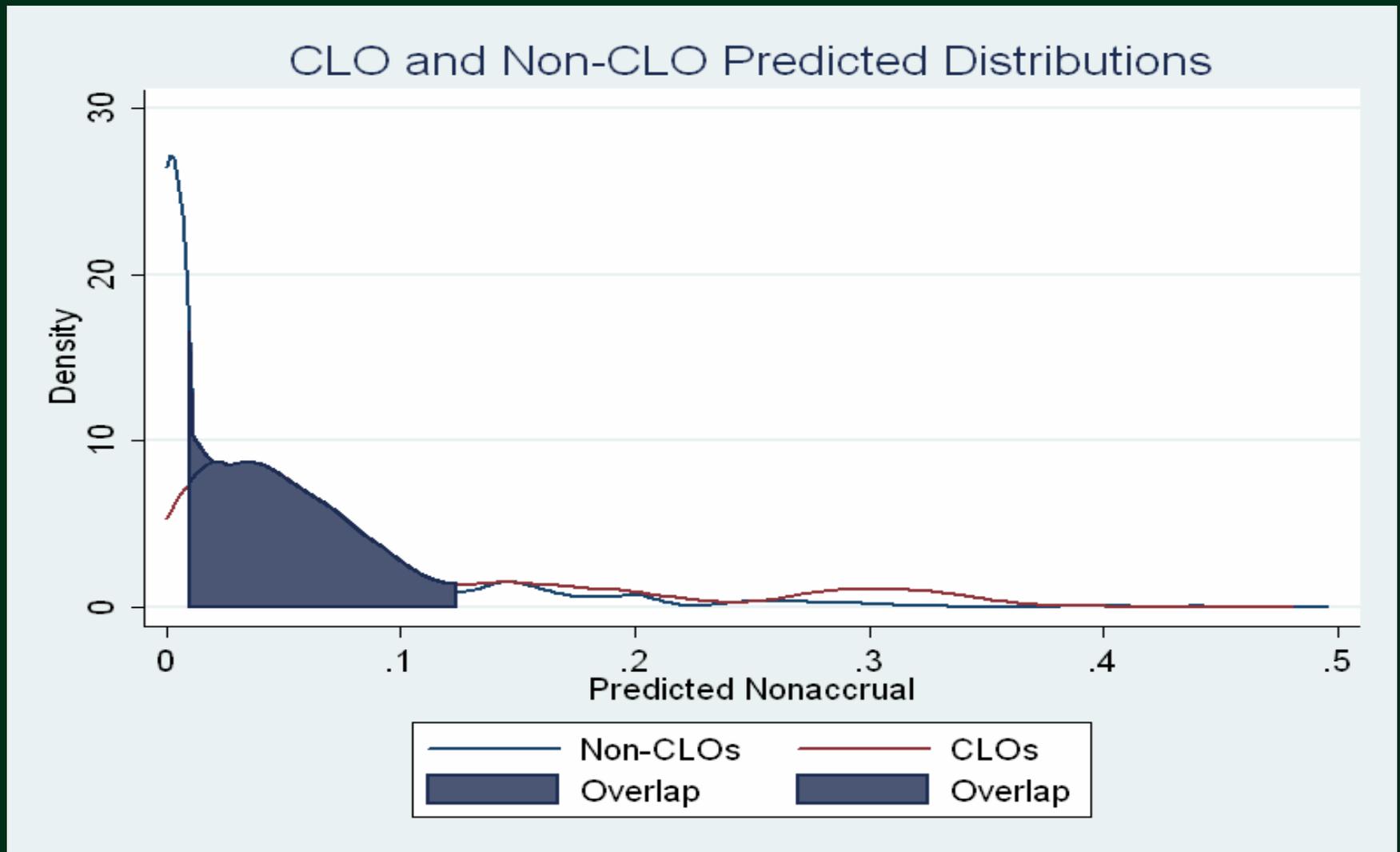
First step: Estimate the probability of default

Second step: Investigate how spreads for clo credits and non-clo credits vary with the predicted probability of default

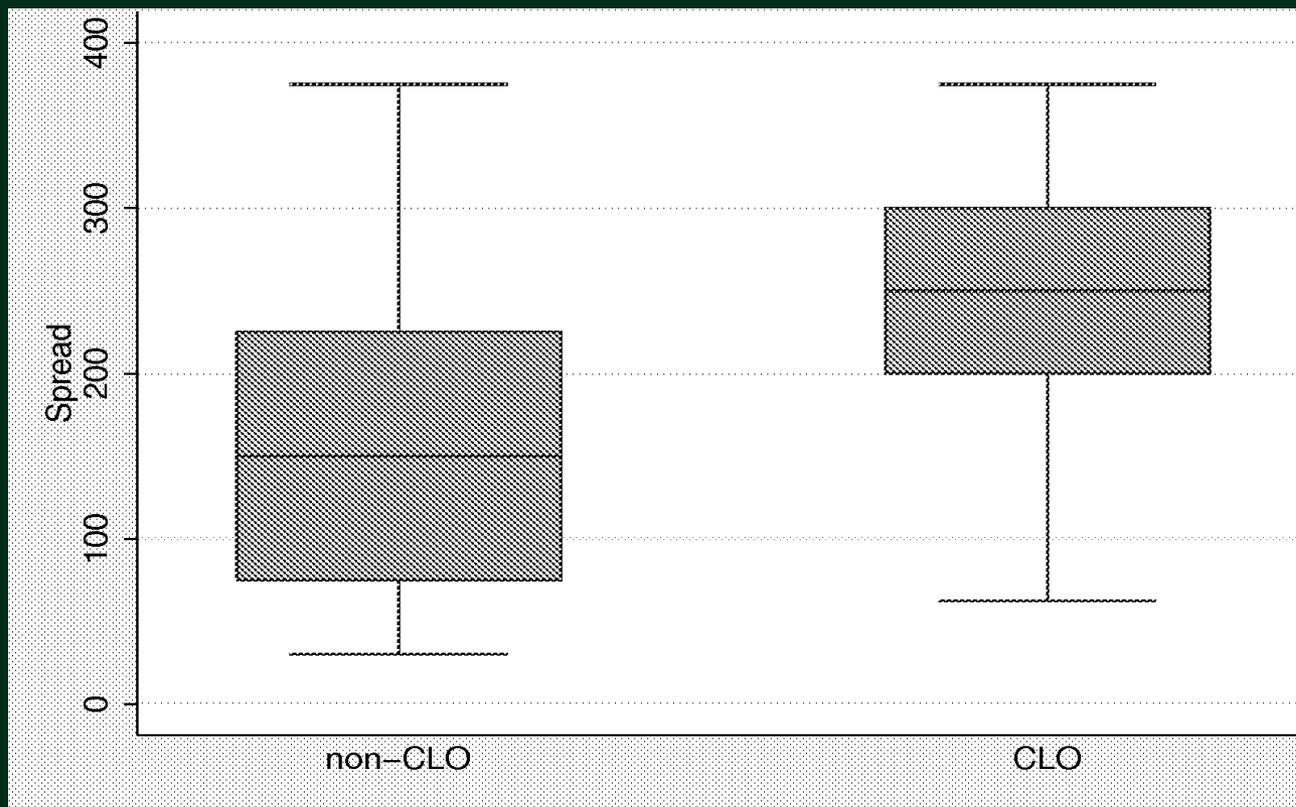
Distribution of predicted nonaccrual



Distribution of predicted nonaccrual



Spreads on loans sold to CLOs and credit risk



Volatilities	Non-CLO credits	CLO credits
PDEFAULT	2.5	2.7
SPREAD	96.5	71.3

Spreads on loans sold to CLOs: Conclusion 2

- Banks anticipated the worse performance of CLO loans and charged higher interest rates on the these loans.
- However, the loan interest rates they charge CLO credits are less driven by risk than their nonsecuritized loans.

Why did CLO loans perform worse than non-CLO loans?

- Lower incentives to screen loans ex ante?
- Lower incentives to monitor loans ex post?

Did banks use different standards to underwrite CLO credits?

- Yes
- We classify loans banks sold to CLOs as follows
 - Borrowers banks lent in the past and also sold their loans to CLOs
 - Borrowers banks lent in the past but did not sell their loans to CLOs
 - New borrowers
- Loans of new borrowers as well as loans of recurring borrowers that banks sell to CLOs for the first time perform worse than CLO loans of recurring borrowers with a CLO history

Did banks have less incentive to monitor CLO loans?

- Yes
- Banks retained less “skin in the game” when they sold loans to CLOs
 - Kept a lower exposure to loans they sold to CLOs
 - Kept a lower exposure to the borrowers of loans they sold to CLOS
- Further, no evidence that syndicate participants fill in banks’ monitoring slack
 - Syndicate participants retained lower exposure to loans banks sold to CLOs
 - Syndicates of CLO loans were less concentrated
 - Median CLO loan share positively related to the bank’s loan share

Does bank monitoring matter?

- Probably
- Compared to “similar” loans sold to CLOs at the time of credit origination, loans bought by CLOs at a latter date in the secondary market:
 - Perform better if the bank does not change its exposure to the credit when the CLO acquires the loan
 - Have similar performance if the bank lowers its exposure to the loan at the time the CLO makes the acquisition

Final remarks

- Loans sold to CLOs at the time of their origination are more likely to default or become nonaccrual.
- Banks accounted for this difference and charged higher interest rates on the these loans.
- However, the loan interest rates they charge CLO credits are less driven by risk than their nonsecuritized loans.
- Difference in performance happened because
 - Banks use different standards to underwrite CLO loans --- worst performance came from loans they extended to new borrowers
 - Banks also had less incentives to monitor CLO loans because they retained less “skin in the game”