On the Benefit of CLO-Bank Relationships: Evidence from Bankruptcy and Restructuring Outcomes of CLO-held Loans

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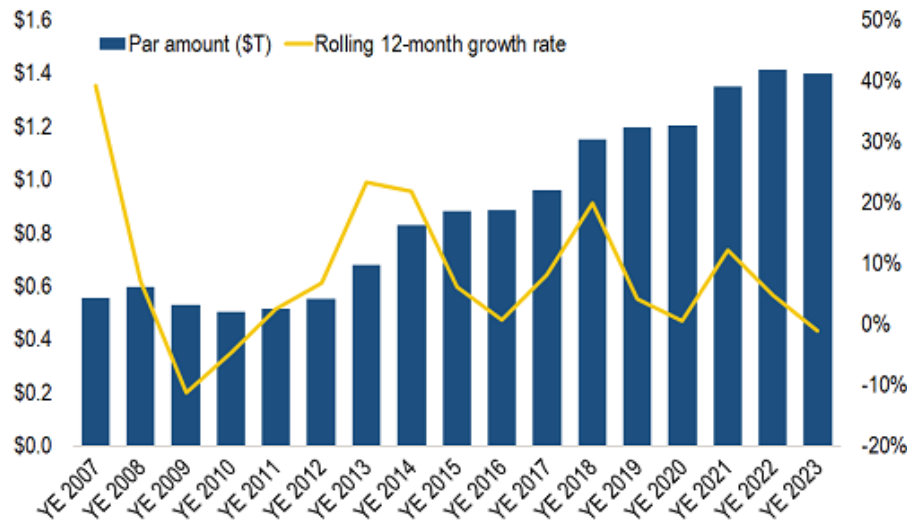Dushyant Vyas (University of Toronto)

ABFER 2024

Agenda

- Background and regulatory debate

- Research questions

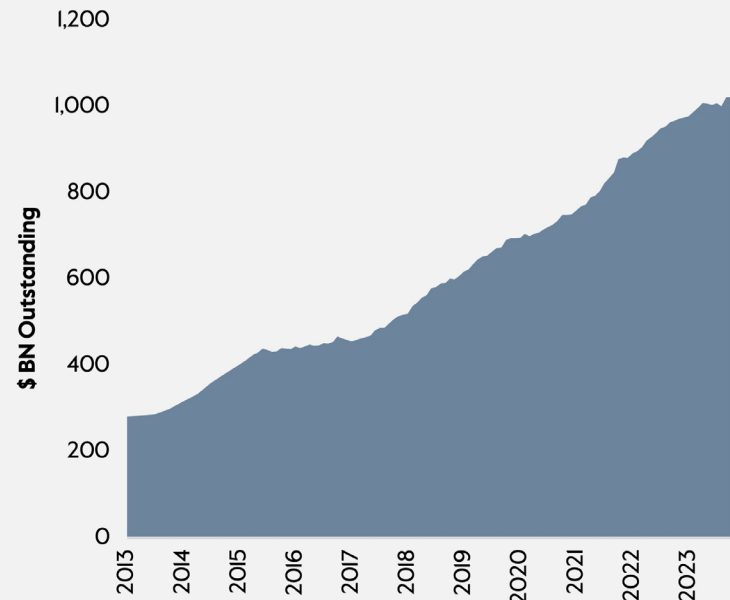- Empirical findings

- Q&A

Leveraged Loans

- Dramatic growth in Leveraged Loans (2x in the last decade), enabled by CLOs

Morningstar LSTA US LL Index: Par amount outstanding
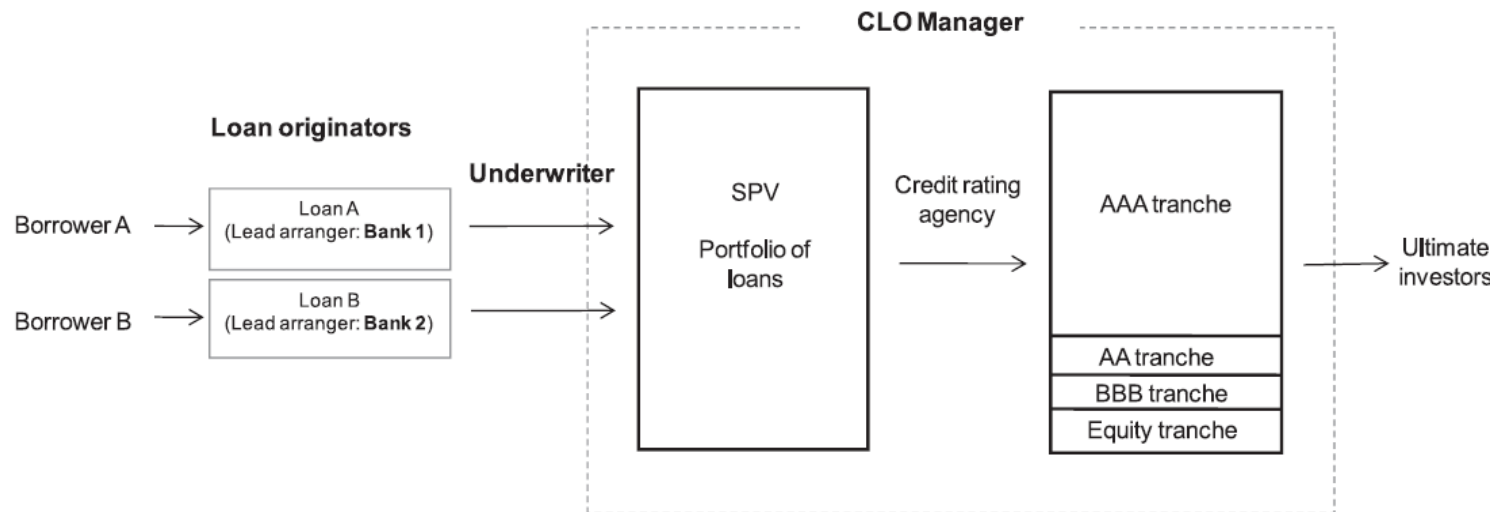

Sources: PitchBook | LCD; Morningstar LSTA US Leveraged Loan Index • Data through Dec. 31, 2023

U.S. BSL CLO MARKET – $1.0 TN[7]

CLOs

- Securitizations of (approx. 150-200) leveraged commercial loans

- CLO manager/issuer is generally not the same as the originator

Source: Benmelech et al. 2012

Regulatory / Policy Debate

- "History Doesn't Repeat Itself, but It Often Rhymes"

- **Regulatory alarm bells** (pre-Covid): Will CLOs lead to the next crisis?

  "I am especially concerned about collateralized loan obligations (CLOs), given the rapid growth of CLOs and the lack of appropriate responses from federal agencies, including the SEC. These securitizations have helped enable increased leveraged loans that are **generally poorly underwritten** and include few protections for lenders and investors, which creates significant risk to the financial system and the American economy."   (*Elizabeth Warren*)

- Wang and Xia (2014): Securitization-active banks originate loans with fewer protections

Covenant-lite share of outstandings, US leveraged loans
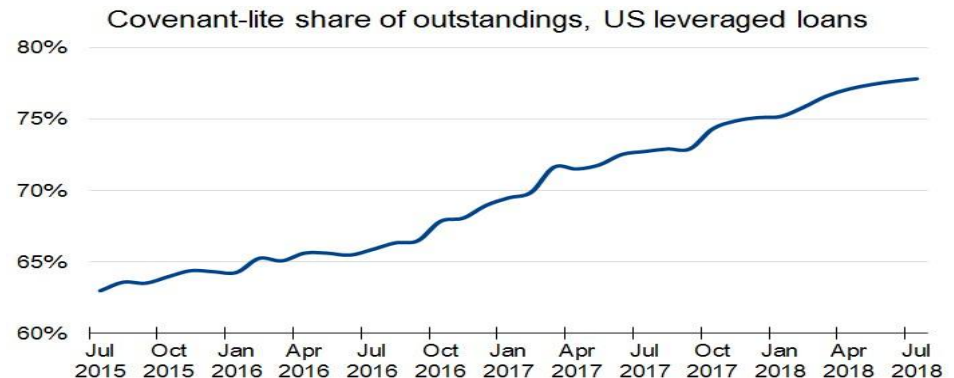
Source: LCD, an offering of S&P Global Market Intelligence

Regulatory / Policy Debate

- On the one hand, research shows that loan securitization *before the GFC* is correlated with **weak monitoring**

  – Wang and Xia (2014) → Looser covenants, more waivers

  – Bozanic, Loumioti and Vasvari (2018) → Standardized covenants

- On the other hand, CLOs have a long record of low defaults on notes

  – CLOs are actively managed

  – Structural constraints – rating and concentration limits

  – The CLO market/players learn from the lessons of GFC?

  – Limited ability to monitor ex post → **so strategically establish long run relationship with lead banks**

Market Evolution

- A remarkable trend
  - CLOs are increasingly purchasing different loans from the same lead bank
    - Relationship based on trading within the last 5 years

	Initial buys from a related bank (amount)
Pre-Crisis	46.01%
Crisis	**75.06%**
Post-Crisis	**76.59%**

Market Evolution

- Does the CLO-bank relationship serve as an evolving market mechanism to address adverse selection and moral hazard concerns?

  - *Mutual building of trust facilitates the sharing of valuable private information about borrowers*

    - *Sharpe (1990); Boot et al. (1993); Boot and Thakor(1994); Srinivasan (2014).*

Main Findings

- **CLOs seem to exhibit a superior ability to screen risky loans:** Firms whose loans are initially purchased by CLOs are **26.0% – 38.3%** less likely to have negative credit events over the next one-year period (compared to other firms with similar level of observable risk)

  - Only during the post-crisis period

  - Only for initial purchases from banks with strong pre-existing relationships

- **Information-sharing argument: Unobservable processing of non-public (private) information**

  - **Inferred through results that are more pronounced in settings where private information is more likely to be available and valuable**

  - Inconsistent with effect due to the direct relationship with the borrower

  - **Inconsistent with intensive ex post monitoring:** Insignificant association between CLO purchases and covenant inclusion

Main Findings (contd.)

- **Implicit delegation of renegotiation to lead banks:** Firms with CLO-held loans are **12.6%** more likely to restructure using **prepackaged Ch 11** (compared to traditional Ch 11)

  - Effect stronger for stronger CLO-bank relationships

  - **Is this delegation efficient?** Apparently so; as firms with CLO-held loans more **24.6%** likely to emerge successfully from Ch 11

- In equilibrium, CLOs strategically establish a strong relationship with banks.

- **Overall: The CLO-bank relationship serves as an evolving market mechanism to address adverse selection and moral hazard concerns post-crisis.**

Sample

- Several databases: CRSP-Compustat Merged database, Creditflux 'CLO-i' database, Thomson Reuters Dealscan database, and the New Generation Research (NGR) bankruptcy database

- Focus on high credit risk borrowers

  - CLOs mainly invest in high-yield or leveraged loans

  - Reduce sample selection bias

  - Creditors have more incentives to acquire information when firms are closer to default (i.e., no point expending a lot of effort in screening AAA-rated firms)

- **Sample comprises firms with non-investment grade ratings (i.e., BB+ or lower)**

Sample

Sample	# of obs.
Monthly Compustat-CRSP matched sample from Jan 2005 to Sep 2019	1,186,620
Minus: Observations without outstanding Dealscan facilities	722,197
Observations with missing control variables	203,028
Observations without S&P entity rating	139,583
Full sample from Jan 2005 to Sep 2019	121,812
Non-Investment Grade sample	70,757

Annual Distribution

| | Full Sample | | CLO initial buys=0 | | CLO initial buys=1 | | (5) – (3) |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	Distress (%)	CLO initial buys (%)	Distress (%)	# of Obs	Distress (%)	# of Obs	t-stat
2005	3.19	0.13	3.17	4,510	16.67	6	1.88*
2006	1.95	2.57	1.95	4,656	1.63	123	-0.26
2007	2.14	11.04	2.21	4,399	1.65	546	-0.85
2008	10.80	18.13	10.80	4,018	10.79	890	-0.01
2009	3.81	16.17	3.87	3,956	3.54	763	-0.43
2010	1.72	17.58	1.93	3,783	0.74	807	-2.35**
2011	2.62	12.86	2.96	4,019	0.34	593	-3.74***
2012	2.43	12.46	2.53	4,038	1.74	575	-1.15
2013	2.02	20.17	2.20	3,630	1.31	917	-1.72*
2014	4.48	23.38	5.45	3,764	1.31	1,149	-5.96***
2015	8.97	5.54	9.39	4,771	1.79	280	-4.34***
2016	2.09	7.65	2.26	4,645	0.00	385	-2.98***
2017	1.98	12.67	1.95	4,368	2.21	634	0.44
2018	3.78	14.27	3.83	4,313	3.48	718	-0.45
2019	4.91	14.22	5.13	3,003	3.61	498	-1.45
Total	3.81	12.56	3.97	61,873	2.72	8,884	-5.72***

Loans purchased by CLOs are less likely to experience distress post-crisis

Specification

$Distress_{f,(m+1,m+12)} = \beta_0 + \beta_1 \, CLO \; initial \; buys_{f,m} + \beta_2 \, EDF + Controls + Firm \; FE + Year \; Month \; FE + \varepsilon_{f,m}$

$Distress_{f,(m+1,m+12)}$ is an indicator variable that equals 1 if the firm f files for bankruptcy or experiences a downgrade to CCC or below in the following 12 months, and 0 otherwise. The independent variable measures *CLO initial buys* of firm f's loan facilities in month m.

Wang and Xia (2014) and Benmelech et al. (2012): The observable risk of borrowers measured by Expected Default Frequency (EDF)

Our paper: Realized credit events conditioning on the same Expected Default Frequency (EDF)

Difference → unobservable information sharing between led banks and CLOs

Average effect

	Distress	Distress	Distress
CLO initial buys	**-0.988****		**-1.462*****
	(0.464)		**(0.444)**
Log *CLO initial buys*		**-0.061****	
		(0.030)	
Coverage Ratio	-1.565***	-1.566***	-1.938***
	(0.377)	(0.377)	(0.478)
Current Ratio	-1.151***	-1.151***	-1.403***
	(0.239)	(0.239)	(0.387)
Leverage	-2.557	-2.559	-1.286
	(1.579)	(1.580)	(2.006)
Total Asset	-1.011***	-1.009***	-1.036***
	(0.222)	(0.223)	(0.324)
MTB	0.182	0.182	0.459
	(0.302)	(0.302)	(0.378)
Profitability	-1.377**	-1.377**	-1.149**
	(0.650)	(0.650)	(0.478)
Tangibility	2.542**	2.543**	-1.739
	(1.048)	(1.049)	(2.130)
EDF	33.992***	33.992***	25.983***
	(3.094)	(3.095)	(2.400)
Rel Arranger	0.772*	0.777*	0.946**
	(0.417)	(0.417)	(0.468)
Rep Arranger	0.156	0.157	0.099
	(0.420)	(0.420)	(0.570)
Institution Lender	-1.454***	-1.456***	-1.008*
	(0.432)	(0.432)	(0.551)
Bank Affiliated CLO	0.298	0.341	-0.346
	(0.665)	(0.669)	(0.602)
Revolver	-1.979*	-1.979*	-0.994
	(1.174)	(1.174)	(1.431)
Lead Bank FE	No	No	Yes
Ind-Year FE	No	No	Yes

0.99% lower future distress probability → 26% of mean probability

Crisis versus post-crisis

	Pre-Crisis		Crisis (2008-2009)		Post-Crisis	
	(1)	(2)	(3)	(4)	(5)	(6)
	Distress	Distress	Distress	Distress	Distress	Distress
CLO initial buys	0.165		-1.393		-1.346***	
	(0.391)		(1.100)		(0.478)	
Log *CLO initial buys*		0.007		-0.084		-0.088***
		(0.031)		(0.079)		(0.032)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Results only for the post-crisis period. Pre-crisis patterns consistent with Benmelech et al. (2012)

CLO-bank relationships

	All periods	Pre-Crisis	Crisis (2008-2009)	Post-Crisis
	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
CLO initial buys× Strong Related	-1.421***	-0.683	-1.154	-1.393***
	(0.381)	(0.765)	(0.921)	(0.387)
CLO initial buys×Not Strong Related	-0.662**	0.265	-0.916	-0.384
	(0.315)	(0.414)	(0.769)	(0.368)
F-test (*p-value*)	0.037**	0.341	0.770	0.020**
Control	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes

1) **CLO-bank relationship indicator**: the CLO manager had transactions with the lead bank in the past five years
   - Accounts for about 80% of initial buys

2) **Relationship density:** the total loan net purchases from the lead bank over the past five years, scaled by the lead bank's total securitized loan outstanding

Strong related is defined as 1 when the relationship density is larger than the median value by year

Results are more pronounced for initial purchases from banks with strong pre-existing relationships, and effect of relationship is only significant in the post-crisis period.

Information sharing versus direct monitoring

Bank-CLO Information sharing: Identify settings where nonpublic info likely to be available and valuable

- Borrowers with less transparent external financial reporting environment (i.e., private info relatively more valuable)

- Loans with spreads that are indicative of higher private info

Ex Post Monitoring (of borrowers): Covenant inclusion in loans

Information sharing versus direct monitoring

	All periods	Pre-Crisis	Crisis (2008-2009)	Post-Crisis
	(1)	(2)	(3)	(4)
	Distress	Distress	Distress	Distress
CLO initial buys×RelatedBorrower	**-0.807**	**-1.530**	**1.256**	**-0.950**
	(0.587)	**(1.188)**	**(1.639)**	**(0.624)**
CLO initial buys×UnrelatedBorrower	**-1.281*****	**0.304**	**-1.505**	**-1.101*****
	(0.404)	**(0.400)**	**(1.110)**	**(0.416)**
F-test (*p-value*)	**0.515**	**0.160**	**0.196**	**0.847**
Control	Yes	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes	Yes

Lower distress likelihood for CLO loans is not associated with direct CLO-borrower direct relationships

More on direct monitoring

	Covenant	With Cov-Lite Loans	
	(1)	(2)	(3)
	Distress	Distress	Distress
CLO initial buys×Cov Lite	-2.047***		
	(0.596)		
CLO initial buys×With Cov	-1.009*		
	(0.564)		
CLO initial buys		-1.493***	
		(0.438)	
Log *CLO initial buys*			-0.102***
			(0.030)
F-test (*p-value*)	**0.193**		
Controls	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Ind-Year FE	Yes	Yes	Yes

Distress likelihood for CLO-held loans does not increase for cov-lite loans

More on info sharing

Banks' Private Information – Debt-Contracting Value

	High Private Info (Low DCV)			Low Private Info (High DCV)		
	(1) Distress	(2) Distress	(3) Distress	(4) Distress	(5) Distress	(6) Distress
CLO initial buys	-2.042***			-0.921		
	(0.631)			(0.719)		
Log *CLO initial buys*		-0.134***			-0.061	
		(0.043)			(0.049)	
CLO initial buys×Strong Related			-2.133***			-0.592
			(0.543)			(0.623)
CLO initial buys×Not Strong Related			-0.803*			-0.593
			(0.451)			(0.578)
F-test (*p-value*)			0.009***			0.999

Effects more pronounced when non-public information potentially more relevant

Chapter 11 Outcomes

- Anecdotal legal arguments, as well as empirical evidence in Demiroglu and James (2015) → CLOs less likely to participate in out-of-court restructuring

- So, does CLO participation lead to costly bankruptcy outcomes?

  - We argue: CLOs have low incentives to exert intense monitoring during the renegotiation period

  - Thus, CLOs (implicitly) delegate the renegotiation effort to either the lead bank or the court

  - Delegation to the lead bank **with a strong relationship** may be efficient due to banks' reputational and relationship effects → Low incentives to rent extract

  - Alternatively, CLOs may be more likely to support prepacks to increase short term recovery rate / avoid uncertainty associated with traditional Ch 11

- **Thus, we expect that CLO ownership is associated with a greater likelihood of prepackaged vs. traditional Chapter 11 filings**

Restructuring Incentives

	Linear Regression		Logit Regression	
	(1)	(2)	(3)	(4)
	Prepack	Recover	Prepack	Recover
CLOhold	**0.126***	**0.246****	**0.759***	**1.037****
	(0.070)	**(0.093)**	**(0.398)**	**(0.422)**
Market Cap	-0.000	0.005	0.005	0.020
	(0.007)	(0.012)	(0.046)	(0.052)
Cashholding	-0.059	-0.105	0.156	-0.317
	(0.073)	(0.130)	(1.363)	(0.732)
Cashflow	-0.000	0.001***	0.071	0.047
	(0.000)	(0.000)	(0.149)	(0.056)
Tangibility	0.034	0.133	0.158	0.530
	(0.100)	(0.144)	(0.873)	(0.654)
Leverage	0.033	0.018	0.318**	0.089
	(0.021)	(0.030)	(0.144)	(0.122)
R&D	-0.000	0.005***	-3.996	-0.287
	(0.001)	(0.001)	(4.137)	(0.737)
Post2007	0.083**	0.019	1.253**	0.089
	(0.033)	(0.073)	(0.439)	(0.343)
Industry FE	Yes	Yes	Yes	Yes
$Adj\ R^2$	0.061	0.094	0.093	0.073
N	614	614	612	612

Higher probability of prepackaged bankruptcy, conditional on filing for bankruptcy
More likely to successfully emerge from Ch 11

Restructuring Incentives

	(1)	(2)	(3)	(4)
	Prepack	Prepack	Emerge	Emerge
CLOhold×Strong Related	0.296**	0.280**	0.472**	0.452**
	(0.134)	(0.129)	(0.165)	(0.167)
CLOhold×Not Strong Related	-0.141	-0.146	-0.149	-0.140
	(0.111)	(0.112)	(0.136)	(0.129)
Control	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes
F-test (*p-value*)	**0.089***	**0.093***	**0.056***	**0.063***

More efficient delegation of renegotiation due to CLO-bank relationship

Strategic relationship establishment

	(1) Chosen	(2) Chosen	(3) Chosen
Strong Related	**0.023***** **(0.001)**	0.002** (0.001)	0.005*** (0.001)
Strong Related × CCC rating		**0.004**** **(0.002)**	
CCC rating		-0.003* (0.001)	
Strong Related × EDF			**0.009***** **(0.002)**
EDF			0.002** (0.001)
Strong Related × Post Crisis		**0.020***** **(0.001)**	**0.023***** **(0.001)**
CLO FE	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Key Takeaways

- Regulatory/academic concerns about poor underwriting driven by CLOs

- CLO-bank relationships serve as an evolving market mechanism to address adverse selection and moral hazard concerns

- CLOs lack incentives to monitor ex post → However, by efficiently delegating renegotiation to relationship banks, the effect of lax monitoring is not visible in our data

- LIMITATIONS:

  1)THE COST OF CLO-BANK RELATIONSHIPS IS NOT EXAMINED (e.g., HIGHER COMOVEMENT BETWEEN BANK AND CLO PERFORMANCE)

  2) COVID 19 PERIOD NOT INCLUDED

THANK YOU!

BACKUP

CLOs

Chart 2
The Typical CLO Lifecycle

Majority of assets typically acquired by the collateral manager during this period.

Manager is actively searching for assets in the primary and secondary markets.

Balance of collateral acquired to reach required portfolio target par balance.

Manager is actively purchasing assets to reach the target par balance.

Usually spans the first two years after the effective date.

CLO issuer is not allowed to redeem any outstanding CLO tranches or change the transaction's terms.

Manager is actively trading in an attempt to maximize the performance of the transaction.

Some managers reinvest with a focus on equity, some with a focus on debt.

Sales of assets are more limited.

Typically trading is limited to prepays and other unscheduled principal pay downs.

Non-call period

Warehouse period | **Ramp-up period** | **Reinvestment period** | **Amortization period**

Pricing date | Closing date

Effective date

End of the reinvestment period

Start | Deal specific | 6 months | 2 years | 5 years | Legal maturity

Supplementary tests: PE-managed CLOs

	All-periods
	(1)
	Bankruptcy
Initialbuy×PE	-0.343**
	(0.134)
Initialbuy×Non PE	-0.291*
	(0.157)
F-test	0.12
Controls	Yes
Industry-Year	Yes
R^2	0.509
N	11,942

Better screening by PE managed CLOs → superior ability or information from the equity side?

Top Managers and Arrangers

Managers

GSO Capital Partners

PGIM

Carlyle Group

Credit Suisse Asset Management

Ares Management

Octagon Credit Investors

CIFC Asset Management

MJX Asset Management

Voya Alternative Asset Management

Sculptor

Arrangers

Citigroup

Morgan Stanley

JP Morgan

Bank of America

Credit Suisse

Goldman Sachs

Barclays

BNP Paribas

Wells Fargo

Jefferies

- "The OC ratio is the par value of the CLO's collateral (after making some important adjustments) divided by the outstanding amount of that particular class of notes together with that of all the classes of notes senior to it in the capital structure"

-
  "The Weighted Average Rating Factor (WARF) is a concept used by these two rating agencies to measure the quality of a CLO's portfolio in ratings terms, converting the rating of each asset into a numerical score"

US CLO average coupon across the stack and weighted average cost of capital (bps)
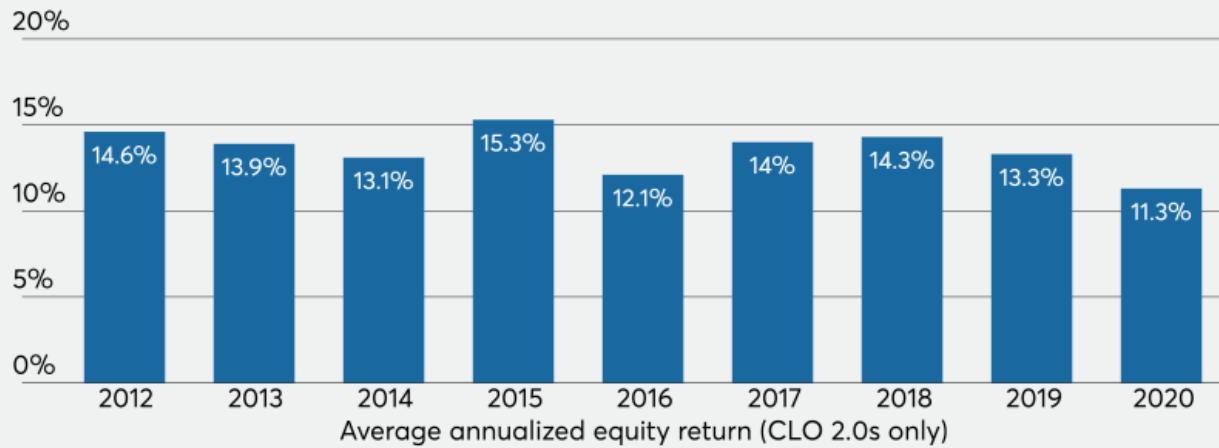
Time frame	AAA	AA	A	BBB	BB	WACC
2Q19 (L+)	135	193	268	378	672	201
3Q19 (L+)	135	190	278	398	704	206
4Q19 (L+)	134	196	277	406	734	203
1Q20 (L+)	124	174	234	349	675	182
2Q20 (L+)	193	266	338	463	690	241
3Q20 (L+)	160	213	279	417	757	217
4Q20 (L+)	138	184	254	396	738	195
Change from 3Q20	-22	-29	-24	-21	-19	-22
Change from a year ago	4	-12	-23	-10	4	-8

Data through Dec. 14, 2020.

Source: LCD, an offering of S&P Global Market Intelligence

Staying on course

Average annualized returns of BSL CLO equity has again hit double-digits despite COVID-related volatility

Average annualized equity return (CLO 2.0s only)

Year	Return
2012	14.6%
2013	13.9%
2014	13.1%
2015	15.3%
2016	12.1%
2017	14%
2018	14.3%
2019	13.3%
2020	11.3%

Source: JPMorgan/INTEX

CLO Performance

	(1)	(2)	(3)	(4)
	CCC Bucket$_{m+12}$	CCC Bucket$_{m+12}$	Default Bucket$_{m+12}$	Default Bucket$_{m+12}$
Strong Relationship	**-0.008*****		**-0.001***	
	(0.001)		**(0.000)**	
Strong Related Pct		**-0.008*****		**-0.001***
		(0.001)		**(0.000)**
Senior OC	0.073***	0.073***	0.009	0.009
	(0.026)	(0.026)	(0.007)	(0.007)
Junior OC	-0.180*	-0.181*	0.014	0.014
	(0.102)	(0.102)	(0.021)	(0.021)
WARF Slack	-0.026	-0.026	0.003	0.003
	(0.017)	(0.017)	(0.007)	(0.007)
Defaulted Bucket	0.002	0.002	0.001*	0.001*
	(0.003)	(0.003)	(0.001)	(0.001)
CCC Bucket	0.009***	0.009***	0.001	0.001
	(0.002)	(0.002)	(0.001)	(0.001)
Portfolio Size	0.273***	0.273***	0.057***	0.057***
	(0.070)	(0.069)	(0.016)	(0.016)
Avg Portfolio Rating	-0.270***	-0.270***	-0.026	-0.026
	(0.073)	(0.073)	(0.030)	(0.030)
Manager FE	Yes	Yes	Yes	Yes
Trustee FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Adj R^2	0.378	0.378	0.150	0.150
N	42,768	42,768	42,768	42,768

CLO performance better in presence of strongly related lead banks

More about Private (Non-Public) Info sharing

Banks' Private Information - Loan Spread Residuals

	High Private Info			Low Private Info		
	(1) Distress	(2) Distress	(3) Distress	(4) Distress	(5) Distress	(6) Distress
CLO initial buys	-1.548**			-0.256		
	(0.615)			(0.495)		
Log *CLO initial buys*		-0.106**			-0.015	
		(0.042)			(0.033)	
CLO initial buys×Strong Related			-1.495***			-0.251
			(0.536)			(0.462)
CLO initial buys×Not Strong Related			-0.862*			-0.158
			(0.501)			(0.351)
F-test (*p-value*)			0.240			0.862

Effects more pronounced when non-public information potentially more relevant

Selling around bankruptcy

	Before Bankruptcy		After Bankruptcy	
	(1) Sell	(2) Sell Pct	(3) Sell	(4) Sell Pct
Strong Related	**-0.109***	**-0.143***	**-0.061**	**-0.028**
	(0.031)	**(0.038)**	**(0.029)**	**(0.047)**
CLO Characteristics	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Cluster	CLO	CLO	CLO	CLO
Adj R²	0.505	0.448	0.568	0.344
N	667	667	839	823

Less likely to sell loans originated by related lead banks

Bankruptcies over time

Bankruptcy Cases