Bank Capital and the Growth of Private Credit

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Banks and Beyond
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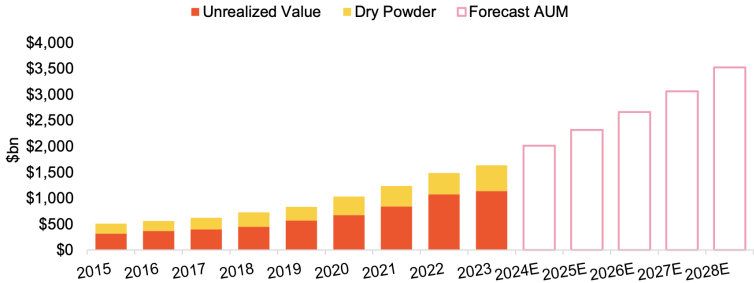
Growth in Private Credit



Source: BlackRock, Preqin. Historical (actual) data from Preqin, as of each calendar year-end, through March 31, 2023. 2024E to 2028E are BlackRock estimates.

- C&I loans, all commercial banks: $2.8tn
- US syndicated loans: $2.4tn
- US CLOs: $1tn
- US high-yield bonds: $1.5tn

Broad questions:

1. What explains the growth in private credit?
2. What are the potential risks to financial stability?

Potential Explanations

1. "Shadow banking" narrative: more stringent bank capital requirements post GFC cause lending to migrate to highly levered nonbanks (threatening financial stability).
   - Basel III Endgame "is great news for hedge funds, private equity, private credit, Apollo, Blackstone... They're dancing in the streets." Jamie Dimon, CEO of JPMorgan Chase
2. Lending to lenders is more attractive.
   - Differences in capital requirements and operating costs.
3. Bank supervision imposes higher operating costs on banks.
4. Private credit investors underestimate risk, require low risk-adjusted returns.
   - Erel, Flanagan, and Weisbach (2024): private credit funds deliver insignificant alpha. Cannot rule out sizable positive or negative abnormal returns.
   - Suhonen (2024) reaches similar conclusions using publicly-traded BDCs.

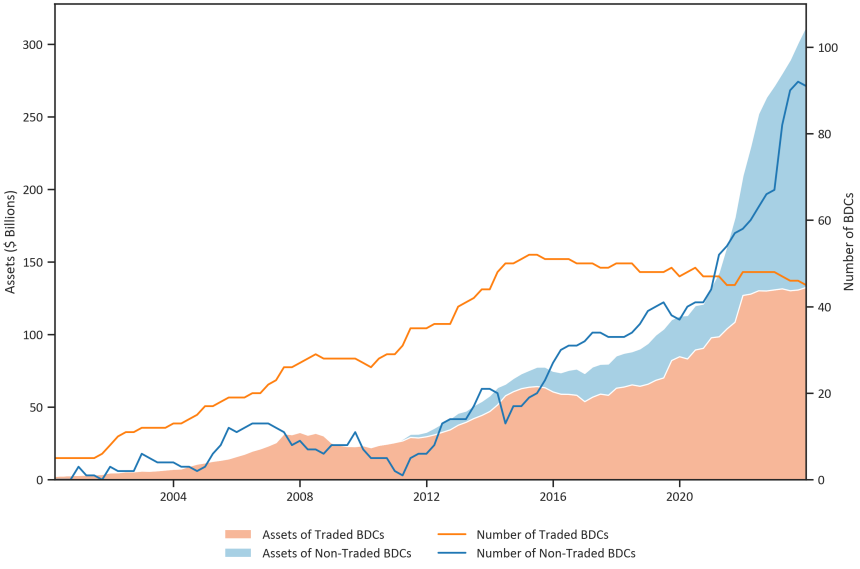
Private Credit Through the Lens of BDCs

- Business Development Companies (BDCs) are actively managed investment companies regulated under the Investment Company Act of 1940
  $\implies$ disclose financial statements, portfolio holdings
- Appear broadly representative of US private credit funds
  - About 20% of US private credit.
  - BDCs and US private credit funds have similar leverage (Block et al., 2024)
  - Coinvestment between BDCs and affiliated funds $\implies$ large overlap in portfolio holdings
- $\geq 70\%$ of assets in eligible investments: US private companies or those with public equity $<$ \$250m
- Leverage restrictions: Assets/Debt $\geq 200\%$; since 2018 can elect 150%.
- Registered Investment Company (RIC) pass-through entity. No entity level taxation; dividends taxed as ordinary income. Must distribute at least 90% of income.

Data

- **Population** of BDC from N-54A and N-54C filings.
- **Portfolio holdings** of all publicly-traded and largest non-traded BDCs from Leveraged Commentary & Data (LCD).
  - Sample period: 2013Q3–2023Q3.
- **Financial statements** from Capital IQ, SNL, SEC API.
- **Debt structure** from Capital IQ + SEC filings.
- **JVs** info from SEC filings.

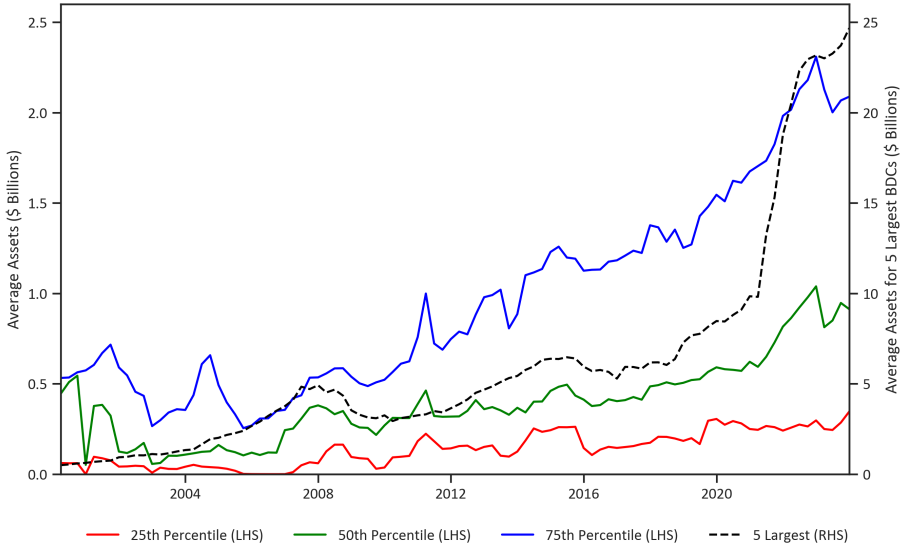
Total Assets and Number of BDCs, 2000Q1-2023Q4



Summary Statistics, 2023Q2

				Percentile			
	Mean	SD	Min	25th	50th	75th	Max
Total assets	4,080	7,463	217	942	2,138	3,316	51,615
Asset shares							
Loans	0.82	0.11	0.58	0.76	0.84	0.91	0.96
Equity	0.09	0.08	0.00	0.04	0.07	0.12	0.29
CLO equity	0.01	0.05	0.00	0.00	0.00	0.00	0.30
JVs	0.02	0.05	0.00	0.00	0.00	0.00	0.22
Cash	0.03	0.04	0.00	0.02	0.02	0.04	0.25
Loan characteristics							
Loan size ($ mil)	15.91	45.58	0.00	1.15	4.78	14.80	1345.80
Loan spread (bps)	648.57	227.56	0.00	550.00	600.00	700.00	4135.00
Default beta	0.86	0.17	0.60	0.74	0.83	0.97	1.49
Debt/Assets	0.50	0.09	0.20	0.46	0.52	0.55	0.69
Debt shares							
Bank debt	0.40	0.21	0.00	0.29	0.41	0.57	0.70
Unsecured bonds	0.46	0.23	0.00	0.32	0.44	0.58	1.00
Securitized debt	0.07	0.15	0.00	0.00	0.00	0.00	0.67
Other debt	0.07	0.16	-0.05	-0.01	-0.00	0.01	0.51
Financing spread (bps)	238.66	51.54	175.00	200.00	230.00	267.06	425.00

BDC Assets by Quartile, 2000Q1-2023Q4



Characteristics of Middle-Market Borrowers

- Based on a sample of 1,857 MM borrowers across private credit funds and BDCs

Percentile	Revenue ($ Millions)	EBITDA ($ Millions)	Debt/EBITDA	EBITDA/Interest
25	88.6	11.8	9.3	0.8
50	183.8	27.3	6.4	1.3
75	378.3	58.3	4.3	1.9
Credit Assessment	$\geq$ **b+**	**b**	**b-**	$\leq$ **ccc+**
Percent of Sample	11.6%	19.5%	40.9%	28.0%

Source: Private Credit: 12% Is Here – First Look at Interest Coverage and Liquidity for Middle Market Borrowers by Sector, KBRA.

BDC Loan Spread, 2013Q3–2023Q3

Comparing Capital and Liquidity of Banks versus BDCs

- Test the "shadow banking" narrative by applying bank capital and liquidity frameworks to BDCs:
  1. Standardized Approach
  2. Stress Testing
  3. Liquidity Coverage Ratio

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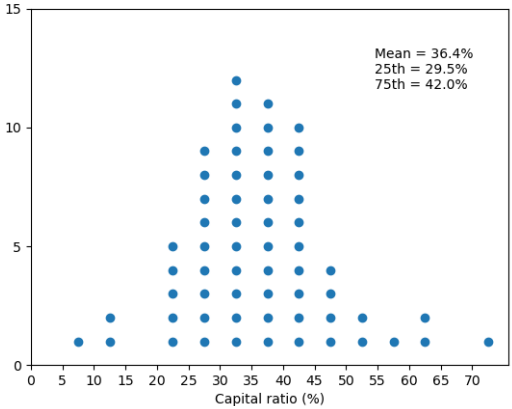
- **General conclusion:** BDCs have much more capital and liquidity than would be required by bank regulatory frameworks. Changes in the level of bank capital requirements are unlikely to explain the growth of private credit.

Estimating BDC Capital Ratios Based on the Standardized Approach



Risk-Weighted Assets (136% median)

Asset	Risk Weight
Loans	100%
Equity in Private Company	400%
CLO Equity	1,250%
Undrawn Loan Commitments	50%

Adjustments

1. Adjust equity by subtracting the difference between fair value and amortized cost to account for fair value accounting used by BDCs versus amortized cost used by banks
2. Subtract allowance for loan & lease losses (ALLL) from assets and equity

Stress Testing BDCs

- Apply 2023 stress testing methodology
- Start with the capital ratio at the beginning of the stress period
- Generate forecasts for the end of the Fed's severely adverse scenario (2 years)
  - Portfolio Losses on C&I loans and equity
  - Annual Pre-Provision Net Revenue (PPNR)
- Capital ratio at the end of the stress scenario is beginning capital ratio less losses plus 2 x Annual PPNR
- Assumes balance sheet is static, i.e. no reduction in assets to de-lever

Overview of Severely Adverse Scenario

- **Economic Factors**
  - Unemployment peaks at 10%
  - GDP falls 3.5%
  - Inflations falls to 1.25%
- **Financial Factors**
  - 3-Month T-Bill yield falls to 0%
  - 10-Year Treasury yield falls to 75bps
  - Investment Grade-Treasury yield spread widens to 575bps from 100bps
  - Equity prices fall 45%

Portfolio Loan Losses in Severely Adverse Scenario

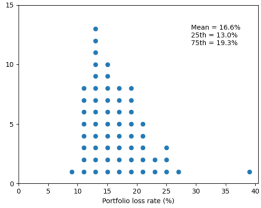
- Modelled loss rates released by the Fed suggest losses of about 15.3% on secured loans and 19.7% on unsecured loans.
  - 75th percentile of loan-level loss rates for speculative-grade loans.
  - Bank speculative-grade loan portfolios are about 3/4 BB and 1/4 B/CCC.
  - BDC loans are mostly B-rated.
  - 75% percentile broadly consistent with Annual default rates
    - default rates spiking to 1 SD above mean, and
    - reported distribution of BDC loans across credit ratings
- Adjust for **industry default beta** – the sensitivity of industry default rate to aggregate default rate Industry default beta
- Assume 40% loss rate on non-accruing loans.

Portfolio Equity Losses in Severely Adverse Scenario

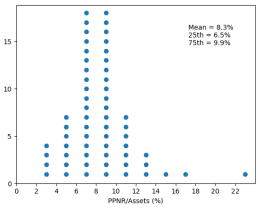
- In the severely adverse scenario, the stock market is forecast to decline 45%; assume equities in portfolio go down 45% as well
- Assume **warrants** expire worthless
- Assume that **CLO equity equity** tranches fall by 41.75%, consistent with industry studies
- For JVs with portfolio holdings in LCD apply the same assumptions to estimate loss on equity
  - Mean equity loss rate of 35.4%
  - For JVs without portfolio holdings in LCD, assume the same mean equity loss rate

Stress Test Results, 2023Q2

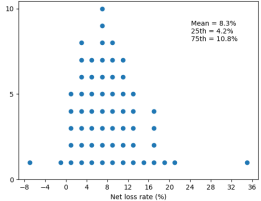
Portfolio loss rate



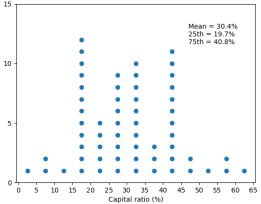
PPNR/Assets



Net loss rate



Stressed capital ratio

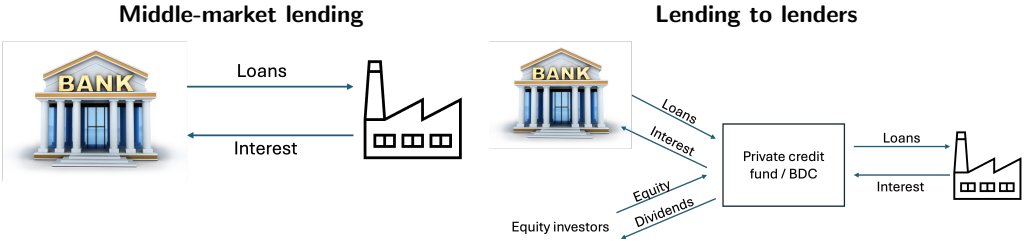


- Mean loss rate of 16.6%. Interquartile range of 13.0–19.3%.
- Mean PPNR of 8.3%. Interquartile range of 6.5–9.9%.
- Interquartile range of stressed capital ratio of 19.7–40.8%.

Key Takeaways and Questions

- BDCs are very well capitalized according to bank capital frameworks.
- Suggests that growth of private credit is not driven by standard regulatory arbitrage story.
- Raises two questions about how banks participate in private credit
  - Why do they lend to private credit funds rather than originate middle-market loans on balance sheet?
  - Why do they originate middle market loans as asset managers rather than on balance sheet?

Middle-Market Lending vs. Lending to Private Credit Funds



Middle-Market Lending vs. Lending to Private Credit Funds

Middle-Market Lending

- SOFR + 600bps; expected loss rate of 160bps
- 100% risk weight implies $\sim$ 12% capital; stress-testing implies $\sim$ 20% capital
- Funding costs SOFR + 55bps
- Operating expenses $\sim$ 1.38% of assets

Lending to Private Credit Funds

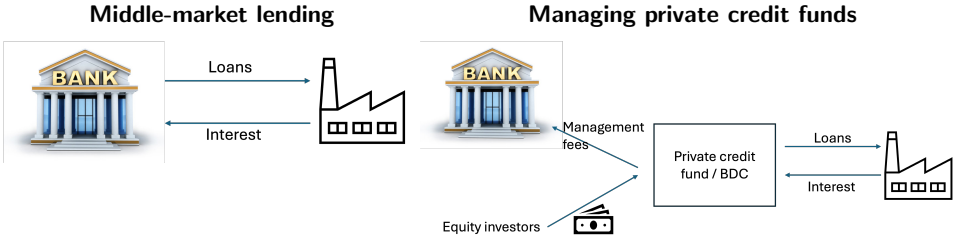
- Overcollateralized loan backed by pool of MM loans $\Longrightarrow$ senior securitization tranche $\Longrightarrow$ 20% risk weight; SLR is binding constraint.
- SOFR + 230bps; de minimis expected loss rate
- Operating expenses much lower, say 0.2% of assets

Implies ROE of $\sim$ 14% for middle market lending and $\sim$ 33% for lending to middle market lenders

What is the source of high ROE of lending to private credit funds?

- Imperfect competition in bank lending
- Risk is greater than implied by AAA rating
- Cost of providing liquidity after a credit line drawdown during period of stress
- Spread on secured loans comparable to spread on unsecured bonds and to weighted average spread on CLO tranches

Middle-Market Lending versus Management of Private Credit Funds



Funding versus Operating Costs

- Consider a bank setting up a middle market lending business. Can do this:
  1. **On balance sheet**, taking advantage of lower funding costs
  2. **Off balance sheet** through asset management arm
- Either way, originate same volume of loans L earning the same interest rate net of expected credit losses, r_L.

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- Either way, originate same volume of loans L earning the same interest rate net of expected credit losses, r_L.
- The NPV of **on-balance sheet** business is

$$\underbrace{-k_b L}_{\text{equity}} + (1-\tau)PV\left[\underbrace{r_L L}_{\text{income}} - \underbrace{r_b(1-k_b)L}_{\text{funding costs}} - \underbrace{c_b L}_{\text{op costs}}\right]$$

- Let $r_b = r_d - \delta$, where r_d is the cost of debt for nonbanks and δ is the money premium or subsidy that banks enjoy. Rewrite NPV as

$$\underbrace{-L + (1-\tau)PV[r_L L] - PV[c_b]L}_{\text{pre-financing NPV}} + \underbrace{\tau(1-k_b)L}_{\text{interest tax shields}} + \underbrace{(1-\tau)(1-k_b)PV[\delta]}_{\text{funding cost advantage}}$$

Value of Private Credit Fund

- Pre-fee value of a private credit fund is

$$-k_p L + PV\left[r_L L - r_p(1-k_p)L - c_p L\right]$$

- Fund is a flow-through entity that pays no taxes.
- Equity investors in the fund are tax exempt.
- Asset manager charges fees equal to the pre-fee value of the fund (Berk and Green 2004):

$$PV[fL] = -L + PV[r_L L] - PV[c_p L]$$

- After-tax value to the bank

$$(1-\tau)(-L + PV[r_L L] - PV[c_p L]) \tag{1}$$

Balance Sheet Lending versus Private Credit

- Bank prefers off-balance sheet lending (private credit) if

$$\underbrace{(1-\tau)(1-k_b)PV[\Delta]}_{\text{funding cost advantage}} \leq \underbrace{\tau k_b}_{\text{tax disadvantage}} + \underbrace{(1-\tau)(PV[c_b]-PV[c_p])}_{\text{operating cost disadvantage}}$$

- If $PV[\cdot] = \frac{1}{r}$, simplify as

$$c_b - c_p \geq (1-k_b)\Delta - \frac{\tau}{1-\tau} r k_b$$

- Suppose $\tau = 25\%, r = 4.81\%, k_b = 20\%$. Then

$$c_b - c_p \geq 0.8\Delta - 0.32\%$$

- If $\Delta = 100$ bps, operating cost differential must be greater than 48 bps.
- If $\Delta = 175$ bps, operating cost differential must be greater than 108 bps.

Key Takeaways

- Operating costs of running a risky loan portfolio on a bank balance sheet are plausibly 50–100 bps greater than if the loans are in a BDC or private credit fund
  - Could be cost of compliance with supervision and regulation
  - Could be suboptimal portfolio decisions related to supervision and regulation
- Banks have no edge in middle market lending but they do have an edge in funding
  - Private credit funds dominate middle market lending despite funding disadvantage
  - Banks choose to lend to private credit funds rather than middle market firms in part because it allows them to exploit their funding advantage with more leverage/less capital
- Credit is not migrating to more leveraged entities as it did pre-GFC

Potential Financial Stability Concerns

1. Banks incur losses on loans to BDCs
   - Risk to banks from lending to BDCs seems low given over-collateralization of loans
2. Banks incur losses on loans they also make to BDC portfolio companies (Haque, Mayer, and Stefanescu, 2024)
3. Violation of regulatory leverage limits (asset coverage) and of financial covenants forces BDCs to reduce lending/liquidate assets
4. Difficulty rolling over debt forces BDCs to reduce lending/liquidate assets
   - Unsecured bonds almost certain to be downgraded to speculative grade.
   - Large share held by rating-sensitive investors: insurance companies and mutual funds.
   - But only 11% of total debt matures within 2 years. ▸ Debt maturity wall
5. Redemptions by equity investors
   - More than $100 billion (1/3) in perpetual BDCs that offer (quarterly) liquidity.
   - Redemptions are at board's discretion, but boards may initially allow investors to redeem, putting pressure on BDC's ability to comply with leverage limits

Stress Testing Asset Coverage Ratios: Preliminary Perspectives

- Investment Company Act of 1940 requires BDCs to maintain 200% asset coverage ratio (assets/debt).
- Small Business Credit Availability Act (SBCAA) of 2018 allows BDCs to elect to decrease their ACR to 150%.
  - Cannot incur additional debt or pay dividends if ACR will be violated.
  - Inability to pay dividends jeopardizes RIC status for corporate tax purposes.
- Bank loans use ACR as a financial covenant.

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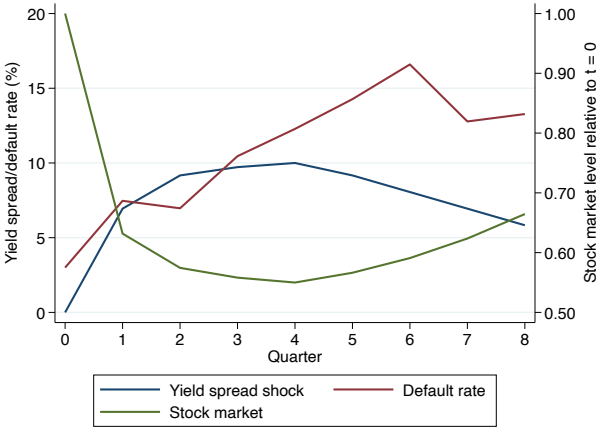
- Approach: Apply dynamic stress testing methodology to measure asset coverage ratios under stress.
- Ingredients:
  1. Macroeconomic scenario
  2. Portfolio valuation
  3. BDC behavior

Stress Testing Asset Coverage Ratios

Macroeconomic Scenario



1. **Stock market** returns are from the Fed's 2023 severely adverse scenario.
   - Stock market drops 45%.
2. **Yield spread** shock = change in the BBB spread in the Fed's scenario scaled by the ratio of changes in B/CCC vs. BBB spreads during the GFC
   - Peaks at 10%.
3. **Default rate** calibrated using data on B/CCC annual default rates during the GFC and quarterly dynamics of bankruptcy filings.
   - Peaks at 16.6%.

Stress Testing Asset Coverage Ratios

Portfolio Valuation

Each quarter estimate the fair market value of each BDC's portfolio.

1. **Loans**
   - Project cash flows using current SOFR and loan spread (cash vs. PIK)
   - Discount projected cash flows at

$$SOFR + Yield\ spread_{2023Q2} + Industry\ default\ beta \times Yield\ spread\ shock$$

2. **Equities**
   - Scale aggregate stock market returns specified in the stress test scenario by industry default beta.
3. **JVs**
   - Value each JV's loan portfolio to calculate value of BDC's stake.

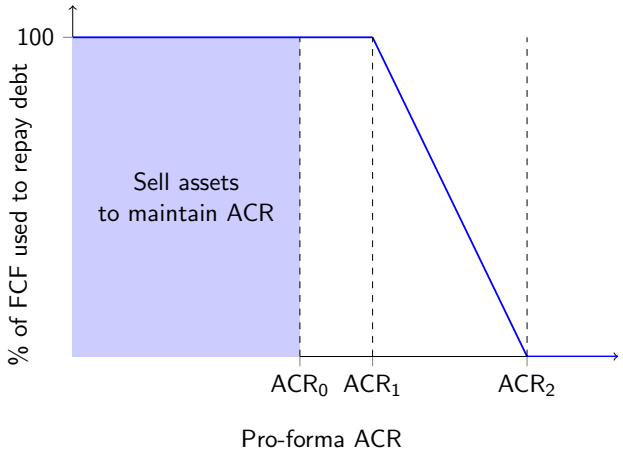
Stress Testing Asset Coverage Ratios

Portfolio Company Default

- Performing portfolio companies default randomly at the base rate scaled by the industry default beta.
- Accounts for cross-sectional correlation in portfolio holdings.
- Once a company defaults:
  - Equity securities are wiped out.
  - No interest income.
  - 60% of principal at default is recovered 6 quarters later.

Stress Testing Asset Coverage Ratios

BDC Behavior



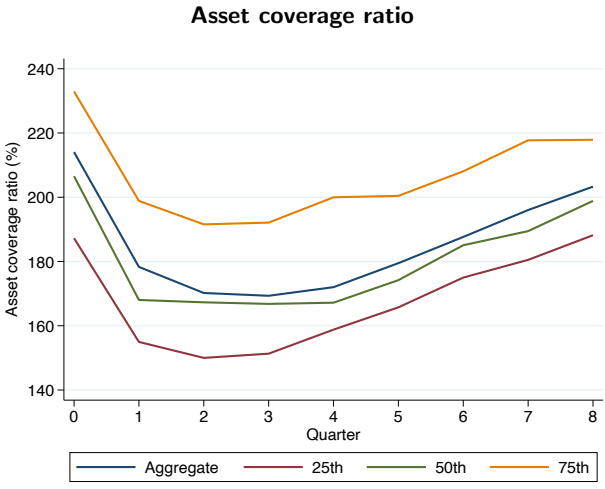
- 90% of Net Investment Income paid out as dividends
- Pro-forma ACR assuming free cash flow (FCF) is used to repay debt
- Remaining FCF reinvested
- Finance negative FCF using debt
- For BDC with 150% minimum ACR:
  - $ACR_0 = 150\%$
  - $ACR_1 = 165\%$
  - $ACR_2 = 200\%$

Stress Testing Asset Coverage Ratios

Limitations

1. Assuming that BDCs maintain their debt structure. Not modeling the ability to refinance maturing debt.
2. Not modeling redemptions from perpetual non-traded BDCs.
3. Not accounting for the lines of credit and undrawn commitments that BDCs have extended to portfolio firms.
4. Not accounting for financial covenants in BDC credit facilities from banks. These may be more likely to bind than the regulatory asset coverage ratio.

Stress Testing Asset Coverage Ratios: Preliminary Results



- Median ACR quickly drops from 206% to 166%.
- Recovers gradually to initial value.

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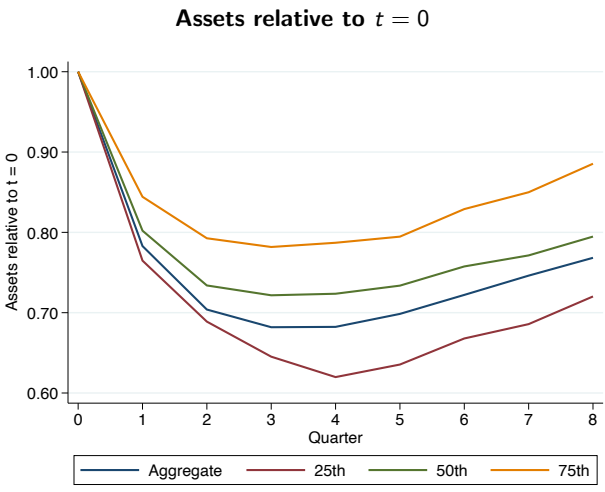

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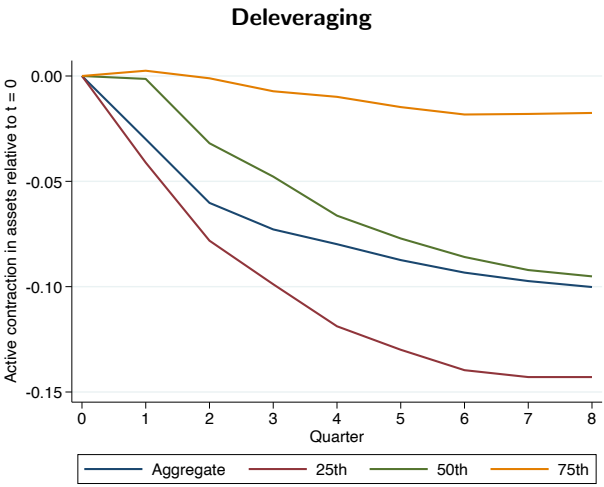

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- Median BDC actively reduces assets by 9.5%.
- 25th percentile reduces assets by 14.3%.

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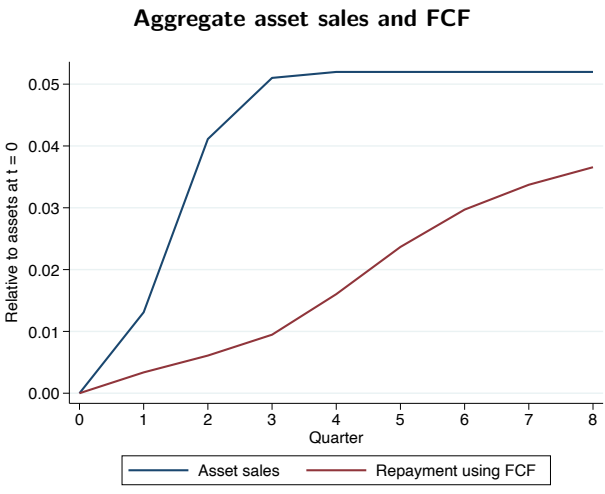

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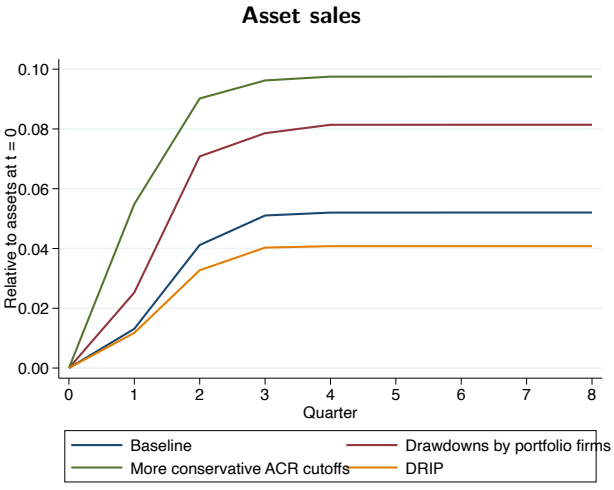
- Aggregate asset sales of $\approx 5\%$.
- FCF equal to 4% of assets used to repay debt.

Alternative Models



Alternative models

1. 50% of commitments to portfolio firms are drawn down at $t = 1$
2. More conservative ACR cutoffs: sell below 165% (210%)
3. Dividend reinvestment (DRIP) declines linearly from most recent value to zero

Takeaways

- Asset sales affected much more than use of FCF.
- More conservative policies result in significantly quicker and larger deleveraging.
- Drawdowns also have a meaningful effect.

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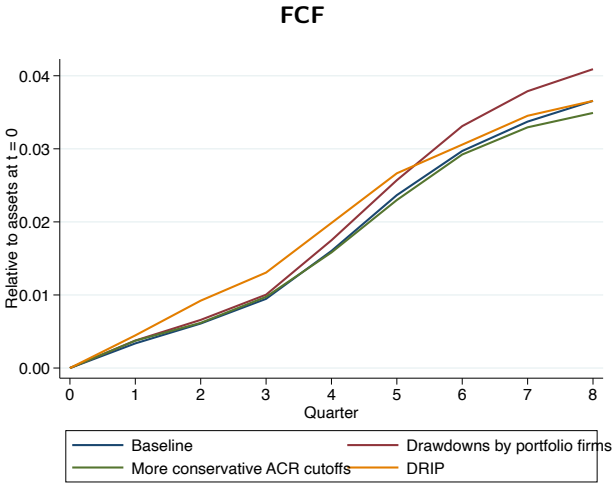

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Implications and Conclusion

- Growth of private credit is not easily explained by the standard regulatory capital arbitrage story.
- Private credit fueled by access to bank funding. More attractive for banks to lend to private credit funds, given favorable capital treatment, spreads, and lower origination costs.
- Leveraged loan guidance could be part of the explanation.
- More fundamentally, the growth of private credit and growth of bank lending to these funds (and NBFIs more generally) suggests that:
  - Banks likely do not have an edge in originating risky loans (high supervisory and compliance costs, lack of focus)
  - Banks do have an edge in raising low cost funding and thus have incentives to make safe loans to private credit funds with an edge in originating risky loans
- Financial Stability
  - Probably limited risk to banks
  - Deleveraging by private credit funds may be a bigger concern, but size and welfare effects are not clear yet

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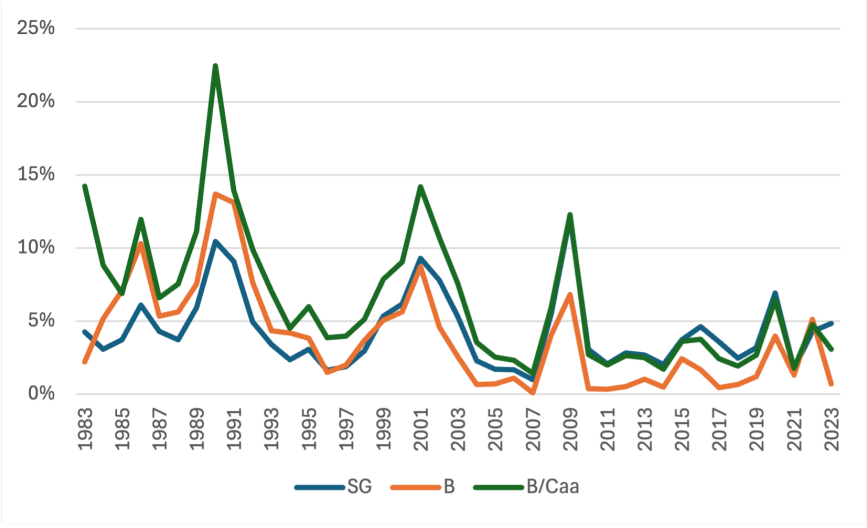
Annual Default Rates



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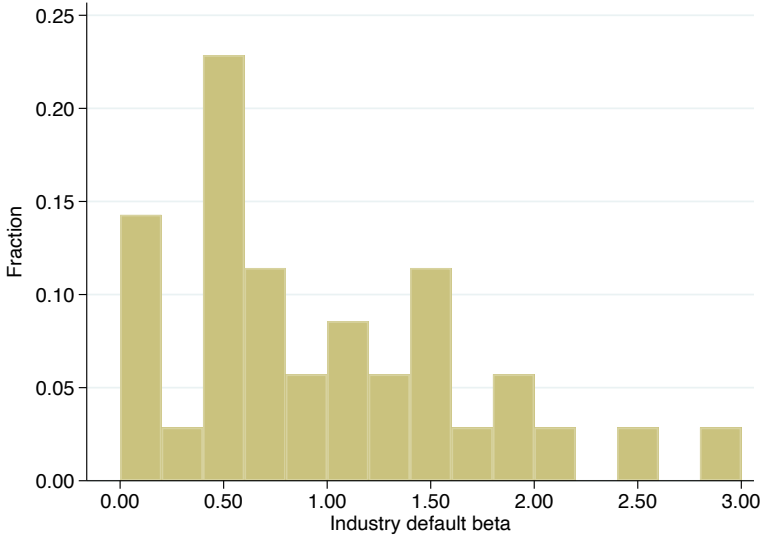
Industry Default Beta

Distribution



Industry Default Beta

Examples

Industry	Beta	Mean	SD	N
Insurance	0.00	0.3%	0.6%	44
Utilities: Electric	0.06	0.1%	0.3%	54
Utilities: Oil & Gas	0.08	0.2%	0.5%	54
Utilities: Water	0.12	0.2%	0.7%	35
Banking	0.19	0.5%	0.8%	49
⋮				
Transportation: Cargo	0.68	2.2%	3.0%	54
Chemicals, Plastics, & Rubber	0.68	0.8%	1.5%	54
Services: Business	0.77	1.9%	2.2%	52
Environmental Industries	0.86	2.9%	4.4%	36
Capital Equipment	0.93	1.4%	1.9%	54
⋮				
Construction & Building	1.85	2.6%	3.5%	54
Consumer goods: Durable	1.92	2.2%	3.9%	52
Media: Broadcasting & Subscription	2.08	3.1%	4.4%	41
Hotel, Gaming, & Leisure	2.43	3.9%	4.8%	45
Media: Advertising, Printing & Publishing	2.88	4.9%	7.2%	42

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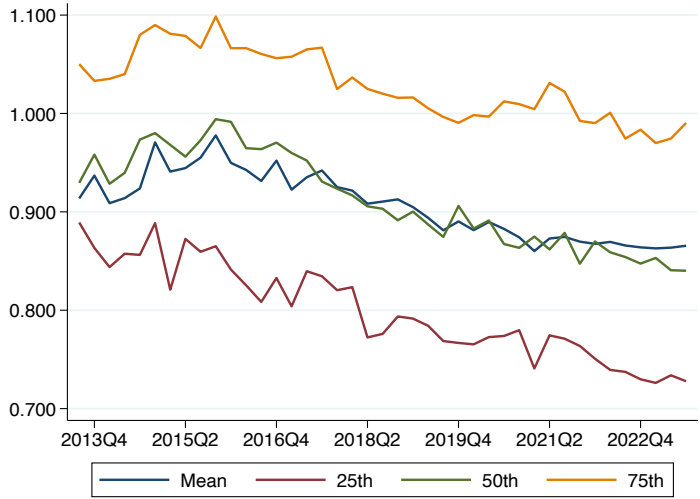
Industry Default Beta

Distribution of Portfolio-Level



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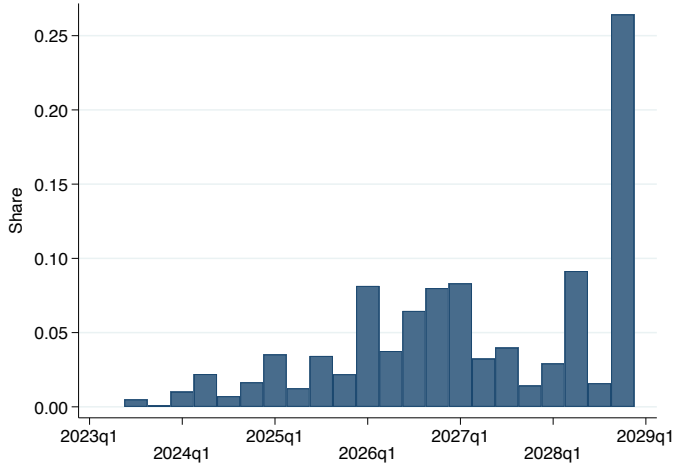
Debt Maturity Wall



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