

Non-bank vs. bank commercial lending: Structural shift, but watch the cycle

Industry Overview

Equity | 11 October 2018

Non-banks now 42% of commercial lending

In this report, we perform a deep-dive analysis of the evolution of the commercial lending ecosystem (excluding corporate bonds). We estimate non-banks comprise 42% of this market, which we define as \$1.0tn in broadly syndicated leveraged lending, and \$400-700bn in private direct lending to middle-market companies. By comparison, on-balance sheet commercial & industrial (C&I) loans represent \$2.2tn. In our view, non-banks will continue to play a more prominent role in commercial financing, especially in a solid U.S. economy. This said, our analysis suggests that in a mild recession, non-bank credit-related cumulative losses could be 90bp higher than for banks, partially mitigated by higher income across the cycle.

Bank commercial growth has lagged...

Non-bank lending has garnered significant interest, not in small part due to the space's recent growth outperformance. Since 2009, non-bank commercial lending has grown 92%, outpacing bank growth by 1.3x and capturing 300bp of market share. But, the story is more nuanced. The largest market share shift in leveraged finance happened before the Global Financial Crisis, as banks ceded 5300bp of market share in the 12 years prior to the GFC. Since 2009, the "new frontier" is represented by the private direct lending market, which at +69% in five years has grown into one of the fastest-growing segments in US corporate credit. For both leveraged lending and private credit, technology and healthcare are the largest sector exposures.

...as structural factors overwhelm the cyclical

Given historically low interest rates, many investors are wondering how much of the share shift to non-banks from traditional banks is structural vs. cyclical. We think consolidation and stringent regulation for banks, along with a reduction in publicly-traded companies, suggest a more permanent shift. Further, the (lack of) inflation and demographics appear to be contributing to structurally lower rates.

Parallel stress test: Bank losses < non-bank losses

We ran a parallel stress test of bank and non-bank commercial credit, and extended the analysis to bank earnings and book value. We looked at three scenarios: 1) +100bp in LIBOR + average levels of defaults and recoveries; 2) a mild recession; and 3) a severe recession. In general, rising interest rates in-line with current expectations are unlikely to drive higher losses in either non-bank or bank loans, given strong interest coverage. In all three scenarios, bank losses are projected lower than nonbank losses.

Econ view: Not systemic, but watch interconnectedness

Corporate leverage is elevated, but we believe this economic cycle has longer to run. In a downturn, all else equal, defaults on bank balance sheets pose greater risk to the system. But, non-banks are still interconnected with the financial system, and we expect the pain in this market to be more severe than for banks in a crisis.

Equity & high yield strategy recommendations: Quality

Given our view on the cycle timing, we would stick to quality banks and managers: PNC, SIVB, ARES. In high yield, this supports our credit strategists' view to begin moderately underweighting lowest quality segments of the market in favor of higher quality segments.

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Equity Research
Erika Najarian
Research Analyst
MLPF&S
+1 646 855 1584
erika.najarian@baml.com

Michael Carrier, CFA
Research Analyst
MLPF&S
+1 646 855 5004
michael.carrier@baml.com

Ebrahim H. Poonawala
Research Analyst
MLPF&S
+1 646 743 0490
ebrahim.poonawala@baml.com

Brandon Berman
Research Analyst
MLPF&S
brandon.berman@baml.com

Christopher Nardone
Research Analyst
MLPF&S
christopher.nardone@baml.com

Michael Needham, CFA
Research Analyst
MLPF&S
michael.needham@baml.com

Ryan Morrison
Research Analyst
MLPF&S
ryan.p.morrison@baml.com

Spencer Kaufman
Research Analyst
MLPF&S
spencer.kaufman@baml.com

Credit Strategy
Oleg Melentyev, CFA
Credit Strategist
MLPF&S
+1 646 855 6379
oleg.melentyev@baml.com

Neha Khoda
Credit Strategist
MLPF&S
neha.khoda@baml.com

Economics
Michelle Meyer
US Economist
MLPF&S
+1 646 855 6261
mmeyer2@baml.com

Alexander Lin, CFA
US Economist
MLPF&S
alexander.lin@baml.com

Stephen Juneau
US Economist
MLPF&S
stephen.juneau@baml.com

Evolving ecosystem of commercial loans

Decade-long, historically low interest rates and more stringent post-crisis regulation on banks have shifted the ecosystem of commercial lending in the U.S. As a result, much has been written about the emergence of non-bank lenders in commercial, non-real estate financing, which recently totaled \$1.4-1.7tn in on-balance sheet bank lending, with non-banks gaining 300bp of market share since 2009. Based on our analysis, we believe structural factors will support growth in non-bank lending in a continued economic expansion. However, in the next recession, we forecast cumulative losses in non-bank originated commercial loans to be 90bp higher than in bank-originated commercial loans (though in good times the return profile tends to also be higher given the level of risk). We think this could exacerbate the next recession, but do not view the risk as systemic.

We explore the following in this report:

- **Commercial lending 101: size, growth, credit providers, and sector exposure.** We look at size and growth of nonbank commercial and industrial (C&I) lending vs. bank-originated C&I lending, and whether this expansion is appropriate relative to U.S. economic trends. In this section, we look at the primary names in the non-bank market. We also analyze how these non-bank lenders fund themselves, and the duration of the funding. Further, we look at sector exposure for banks and non-banks.
- **New frontier: the private debt market.** Estimated between \$400-700bn, the private debt market (defined as a lending source providing a loan directly, cutting out an intermediary) has been one of the fastest growing categories, up 43% over the past 3 years. We dig deeper into this asset category, where marketplace information can be scant.
- **Assessing cyclical vs. structural trends.** We examine how much of the market share shift to non-banks can be attributed to cyclical factors (low rate policies globally) vs. structural (bank consolidation, regulation, shift towards move private v. public companies). Moreover, we also explore which seemingly cyclical factors could be more structural in nature (disinflationary trends).
- **Investor protections vs. bank underwriting standards.** In this section, we look at investor protections for non-bank sourced financing. On the bank side, we look at how banks analyze creditworthiness.
- **Stress testing for credit losses.** In this section, we run a parallel stress test of credit losses under three different scenarios: 1) **normalized**, representing a +100bp increase in front-end rates and losses near long-term averages for frequency of default and severity (or loss) upon default; 2) **stressed case**, or a recessionary scenario akin to the early 2000s; and 3) **severely stressed case**, which looks at losses in a deep recession. We believe that the likely outcome in the next recession will be scenario #2, or the stressed case. Lastly, we assess liquidity risk that could drive more significant mark-to-market risk in a distressed backdrop.
- **Sizing potential impact on the US economy.** Lastly, we also explore the level of corporate indebtedness relative to history. We also look at the potential impact of this growing market on the economy today, and on the economy later (in a cycle).

High yield strategy

Investors have poured close to \$750bn into U.S. HY (high yield), leveraged loans, and private debt funds and instruments over the past five years in search of excess returns and protection against rising interest rates. This trade has worked well so far. However

our analysis in this report shows that we may be approaching the point where such reach for yield potentially brings more risk than reward.

We estimate the next credit cycle, when it happens, could bring credit losses to the extent of 2 years of expected annual yield income in high yield and leveraged loans, and 1.3 years in private debt. Investors could also experience temporary mark-to-market losses of up to 5 years of their annual income. To put this potential risk into perspective, it would take a 325bp increase in yield to wipe out 2 years of yield income in HY, given the 4yr duration of this asset class. A 325bp increase in yield coming primarily from rising Treasury yields is a much less likely event from here than another credit cycle hitting us at some point over the next few years.

While we do not believe [the next credit cycle](#) is imminent, this evidence improves our confidence in the existing [positioning recommendation](#) to begin moderately underweighting the lowest quality segments of the market in favor of higher quality segments.

— Oleg Melentyev, Neha Khoda

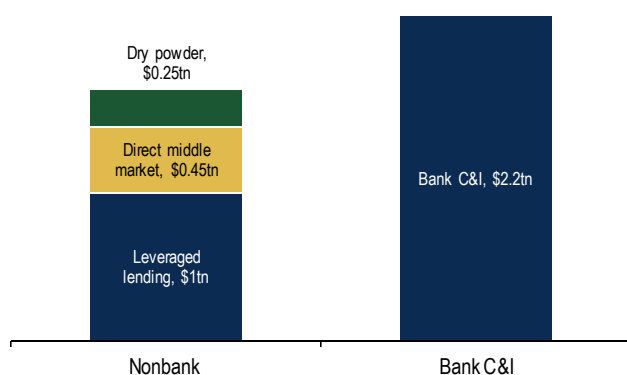
Commercial lending 101: The basics

In this section, we dive deeply into the basics of the nonbank and bank commercial lending market, which is sometimes referred to as C&I (commercial and industrial) lending. We focus on on-balance sheet C&I loans at banks, broadly syndicated leveraged loans, and non-bank private, direct middle market lending. Non-bank commercial growth has materially outpaced on-balance sheet bank C&I growth, by 23% since 2009. That said, the largest move in market share, particularly in leveraged finance, occurred prior to the Global Financial Crisis – suggesting that non-banks are here to stay, as providers for specific asset class. There may be more debate of the staying power of the private direct lending market, which we estimate recently comprised 18% of non-bank C&I loans.

Estimated size of non-bank market: \$1.4-1.7 trillion, up 92% since 2009

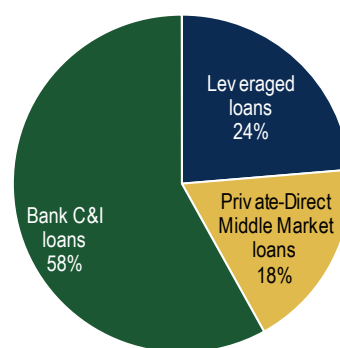
We estimate the size of the nonbank, commercial loan market to be \$1.4-1.7 trillion, compared with \$2.2 trillion for bank C&I lending (see Chart 1). Out of the \$1.4-1.7tn in nonbank commercial lending, we estimate \$1.0tn represents broadly syndicated leveraged loans.

Chart 1: Non-bank comm'l lending \$1.4-1.7tn vs. bank C&I bal of \$2.2tn



Source: Federal Reserve, Preqin, company reports
As of 9/30/18, except private debt as of YE17

Chart 2: Nonbank C&I loans = 42% of total C&I lending (excl. corp bonds)



Source: Federal Reserve, Preqin, company reports
Note that leveraged loans represent broadly syndicated financing, and excludes any estimated exposure left on bank balance sheets. As of 9/30/18, except private debt as of YE17

By its nature, the private debt market is more difficult to size; hence, our range of \$1.4-1.7tn. We would cite a few sources: first, using the Fed's Flow of Funds data, we would estimate the private lending market at around \$700bn after excluding banks, high yield, investment grade, and leveraged lending. A data source called Preqin sizes the market at \$650bn, though we note that this is as of year-end 2017 and includes about \$250bn of "dry powder" – funds raised but not yet deployed. Meanwhile, private equity firm Ares Management sizes the direct lending market at \$900bn, which we believe includes bank loans as well as direct lending. As such, we think an estimated range of \$400bn-700bn for the private lending market is appropriate. (In this analysis, as we compare market share and otherwise use the private lending market as a data point, we use the mid-point of this range.)

Note: we do not include corporate bond issuance in this analysis.

Below, we summarize the typical structure of non-bank commercial financing:

High yield issuer: 60% debt, 40% equity; debt: 50/50 secured loans/unsecured bonds; equity: 70% public, 30% private

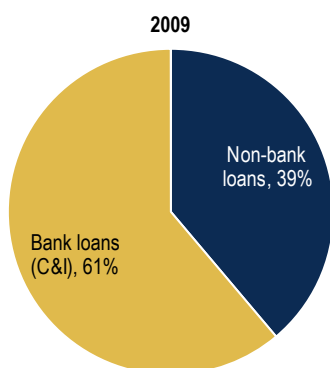
Leveraged loan issuer: 65% debt, 35% equity; debt: 80/20 loans/bonds, equity: 75% private

Private debt borrower: 55% debt, 45% equity, debt: secured + junior private loan (2nd lien or mezzanine), or unitranche, equity: predominantly private

Non-banks have taken share, though share shifts more dramatic pre-crisis

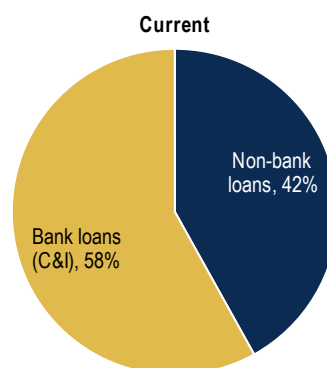
Structural and cyclical factors (which we discuss in detail later) have contributed to non-banks taking market share from banks of late. In 2009, banks sourced 61% of commercial, non-bond financing in the U.S. (We point out that non-banks already had significant market share during this time.) As of 2Q18, banks have ceded 300bp of market share (see Chart 3 and Chart 4). Note that available data for the private lending market was de minimis in 2009.

Chart 3: Banks represented 61% of the corporate lending market...



Source: BofA Merrill Lynch Global Research, Federal Reserve, Prequin, S&P LCD

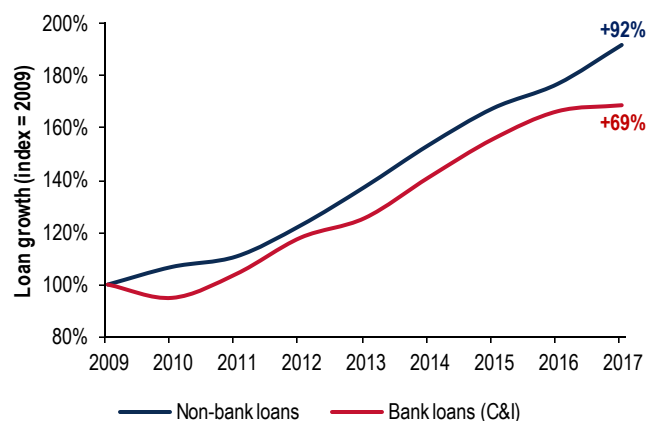
Chart 4: ... however have ceded 300bp to non-bank players



Source: BofA Merrill Lynch Global Research, Federal Reserve, Prequin, S&P LCD
Note: data as of YE17

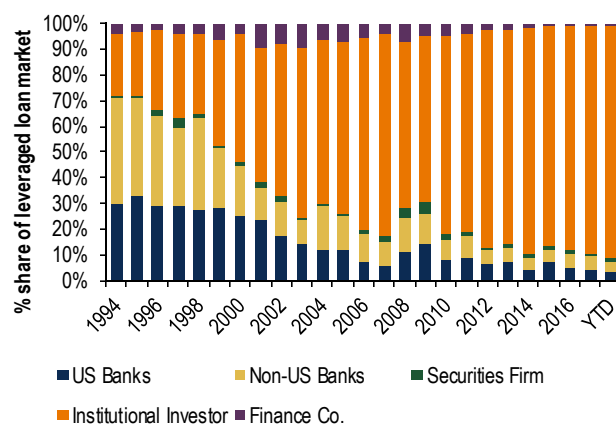
Many have pointed the robust growth of nonbank C&I lending (up 92% since 2009, or a 8% CAGR) vs. bank C&I lending (up 76% since 2009, CAGR of 6%) to conclude potential excess in nonbank lending (see Chart 5). However, more significant share shifts had occurred prior to the crisis. For example, between the early 1990s and 2006, banks' share of the leveraged loan market had shrunk to 18% from 71% (see Chart 6).

Chart 5: Comm'l non-bank lending has outpaced bank lending by 1.3x



Source: BofA Merrill Lynch Global Research, Federal Reserve, Preqin, S&P LCD

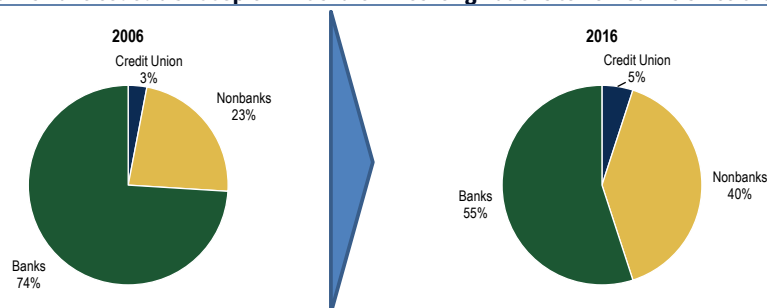
Chart 6: Banks' share of the leveraged loan market



Source: BofA Merrill Lynch Global Research, Federal Reserve, Preqin, S&P LCD

While the shift in market share (overall non-bank vs. bank commercial lending) is notable, it is not as dramatic in context of other asset classes. For example, banks have ceded a remarkable 3,400bp of market share in residential real estate originations to non-banks since the crisis (see Exhibit 1). In other words, nonbank lending has been a significant provider of commercial credit for some time, debunking the thesis that this is a “new” industry that emerged from the Global Financial Crisis. That said, as we explain in detail in a later section, private, direct middle-market lending is a more recent phenomenon.

Exhibit 1: Banks have ceded a 3400bp of mkt share in resi originations to non-banks since the crisis



Source: BofA Merrill Lynch Global Research, MBA, Inman

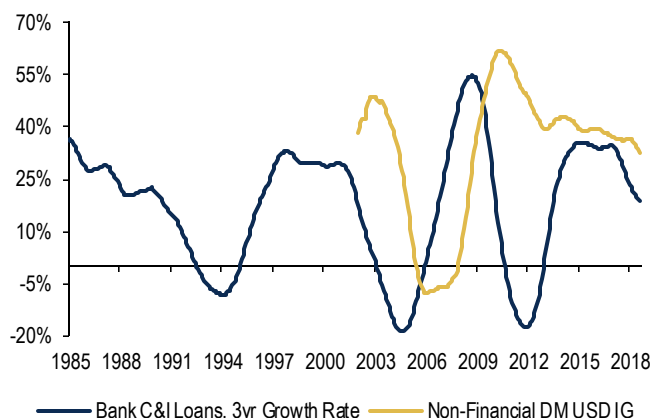
As we will discuss, we believe the more significant share shifts have occurred in the non-bank private lending market rather than leveraged lending, though the size of the market is smaller.

Non-bank growth has been robust, on an absolute basis and relative to GDP

Going into detail, all segments of corporate lending have experienced significant growth over the past decade. However, high yield (HY), and to certain extent, bank loans, have posted declining rates of growth. Private and syndicated leveraged loans stand out from this picture, as peak growth happened more recently (2015-2016), achieved very significant absolute levels (+40-50% on a three-year basis). Further, these two commercial loan classes have shown renewed growth in recent quarters. Cumulative growth in non-financial corporate credit over the past five years reached \$2.8 trillion,

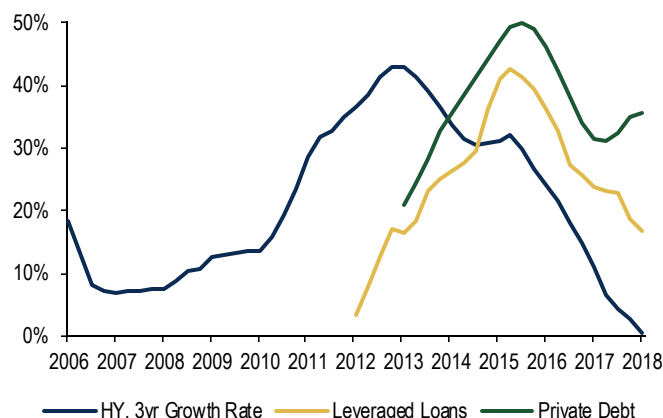
and was distributed as following: private debt +68% (~\$300bn), syndicated loans +60% (\$300bn), IG +70% (+\$1.3tn), bank loans +44% (\$680bn), HY +15% (\$130bn).

Chart 7: Growth in bank loans and IG



Source: BofA Merrill Lynch Global Research, Federal Reserve

Chart 8: Growth in leveraged finance and private debt



Source: BofA Merrill Lynch Global Research, Federal Reserve

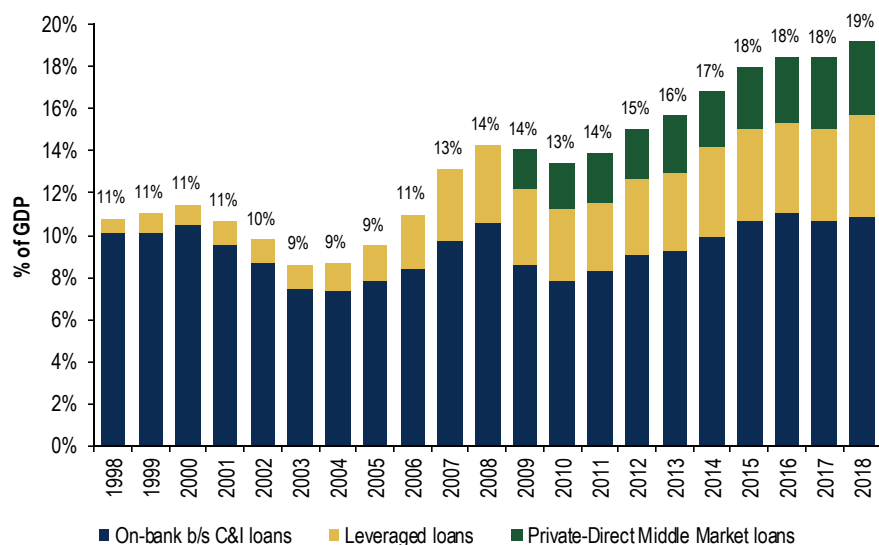
Non-bank commercial lending relative to GDP has grown

We think growth relative to GDP, rather than market share shifts, is a better way for equity and credit investors to gauge potential excess. Non-bank commercial lending has grown faster than GDP.

Overall commercial loans most recently represented 19% of GDP, vs. 14% at the height of the last economic cycle and 11% in the late 1990s (see Chart 9). This is clearly a material increase, indicating higher levels of corporate indebtedness – and this excludes bond issuance.

Over 20 years, bank C&I lending has ranged from ~8-10% of GDP, and represented 10% of GDP most recently. Meanwhile, nonbank C&I lending now has an 8% share of GDP, vs. 1% 20 years ago.

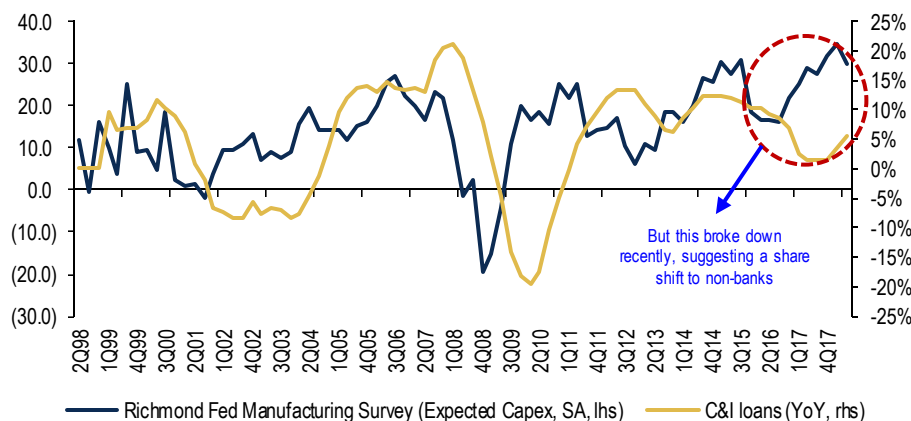
Chart 9: Corporate lending represents ~20% of GDP vs. 14% during the crisis



Source: BofA Merrill Lynch Global Research, Federal Reserve, Preqin, S&P LCD
 Note: Private-Direct Middle Market Loan data is unavailable prior to 2009

In recent history, there has been a relationship between on-balance sheet bank C&I loan growth and expected CapEx activity, with expected CapEx activity as a leading indicator by three quarters (see Chart 10). The relationship between the two has deteriorated recently. This implies that nonbanks could be capturing even more share in the post-Trump economy, which of course was recently fueled by corporate tax cuts. We think the private lending market has been part of the more recent share shift.

Chart 10: Expected CapEx activity has historically preceded on-bank b/s C&I loan growth by 3-qtrs



Source: BofA Merrill Lynch Global Research, Federal Reserve, Richmond Fed

Who are the non-bank credit providers?

The non-bank credit providers tend to be investment managers of different products and vehicles. All three asset classes (high yield, leveraged lending, private middle-market) are heavily institutional, which is a benefit in terms of relative stability of capital.

First, we look at providers in the leveraged loan market (see Exhibit 2). These providers primarily include CLO (collateralized loan obligation) managers, separate account managers, and mutual fund managers. Some of the largest leveraged loan managers include GSO Capital, Carlyle, CSAM, etc.

Exhibit 2: Providers of non-bank leveraged finance capital

Segment weight, %	HY Bonds	Leveraged Loans	Private Debt
SMAs/Dedicated Funds	51	33	81
CLOs	10	51	7
Retail Funds	31	15	1
ETFs	8	1	0
BDCs	0	0	11
Total	100	100	100
Estimated market size, US\$bn	1,300	1,000	400-700

Source: BofA Merrill Lynch Global Research

SMAs = separately managed accounts, BDCs = business development company

High yield is most exposed to retail/unconstrained institutional capital. Conversely, syndicated leveraged loans are more immune with 51% in locked-in CLO capital, although reinvestment periods are relatively short. Also, separately managed accounts and dedicated institutional funds in leveraged loan space are less likely to have meaningful restrictions on early withdrawals of capital.

Importantly, private debt funds, on the other hand, routinely restrict investor options for early withdrawals, making the structure of this market much less susceptible to sudden outflows and fire sales

Private credit market providers primarily include institutional fund and separate account managers, CLO managers, as well as managers of BDCs (Business Development Companies), though there is less data available in the private credit market. Some of the largest private credit managers (including distressed) include Oaktree, GS Merchant Banking, and GSO, while the U.S. direct lending part of the market tends to be led by ARES, GS Merchant Banking, and HPS, etc. (see Table 1 and Table 2).

Table 1: Largest private credit fund managers

Capital raised over last 10 years, \$ in billions

Firm	Total Capital Raised
Oaktree Capital Management	51.7
Goldman Sachs Merchant Banking	37.4
GSO Capital Partners	26.8
HPS Investment Partners	21.8
Intermediate Capital Group	21.2
Centerbridge Capital Partners	18.6
Apollo Global Management	18.3
Ares Management	18.1
Cerberus Capital Management	17.4
Fortress Investment Group	16.6

Source: Preqin

Table 2: Direct lending managers

Capital raised over last 10 years, \$ in billions

	Total Capital Raised
Ares Management	14.8
Goldman Sachs Merchant Banking Division	13.1
Intermediate Capital Group	10.7
HPS Investment Partners	8
BlueBay Asset Management	7.5
Benefit Street Partners	7.2
Cerberus Capital Management	7
Golub Capital	6.6
Hayfin Capital Management	6.6
Apollo Global Management	6.4

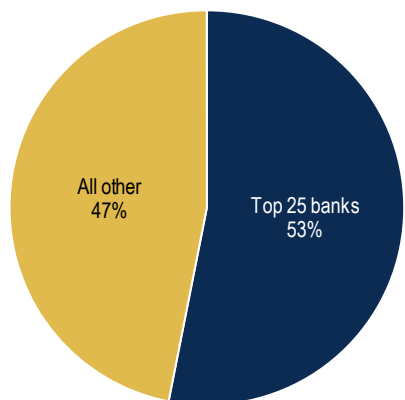
Source: Preqin

Within banks, regionals are growing faster in commercial of late

On a dollar basis, the top 25 banks in the U.S. (with the smallest at \$114bn in assets) held a 53% share of on-balance sheet C&I lending (see Chart 11). In the post-Trump US economy, regional and community bank C&I loan growth has materially outpaced that of the top 25, by an average of 288bp over the past four quarters (see Chart 12).

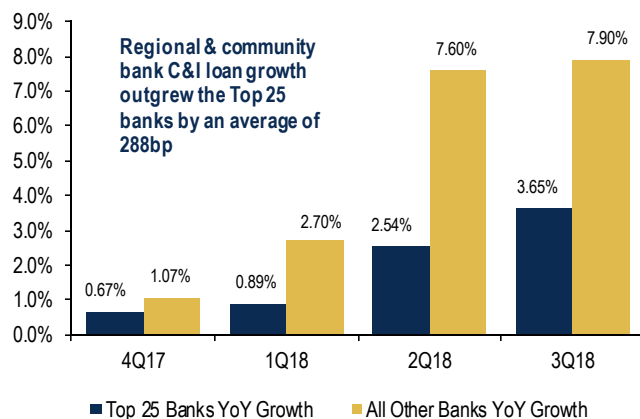
But larger banks have been losing market share over a long period of time. C&I lending from the top 25 banks represented 7.5% of GDP in 1985; in 2Q18, the share was 5.7% (see Chart 13). Meanwhile, smaller regional banks increased share to 3.2% of GDP in 2Q18 from 2.7% in 1985 – suggesting the large banks are not just losing out to nonbanks in this asset class.

Chart 11: Top 25 US commercial banks hold over half of total C&I loans



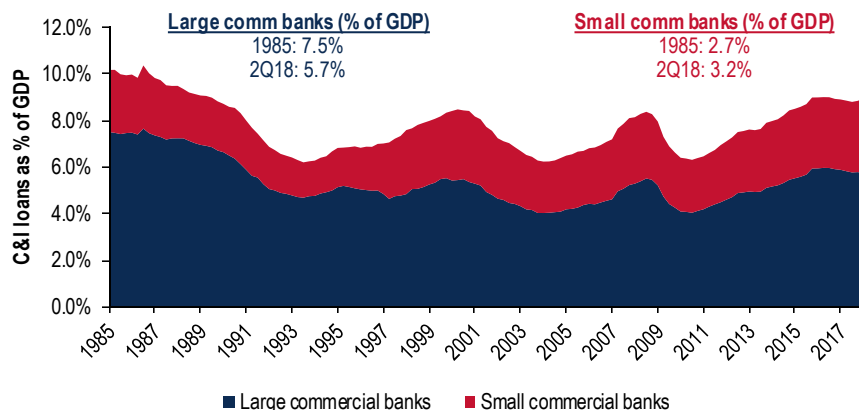
Source: Federal Reserve

Chart 12: Regional & community banks C&I vs. Top 25 banks



Source: Federal Reserve

Chart 13: Smaller US commercial banks becoming a larger share of C&I lending



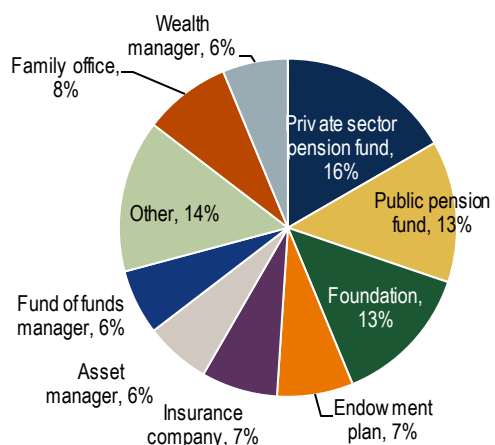
Source: Federal Reserve

Source of funds for non-bank credit providers: Mostly institutional

Breaking the non-bank credit market down into the two main segments, we begin with the leveraged loan market. Funding sources for this market primarily include institutions (including insurance companies, pension funds, banks, hedge funds, asset managers, etc.) as well as retail investors via mutual fund managers (see Chart 14).

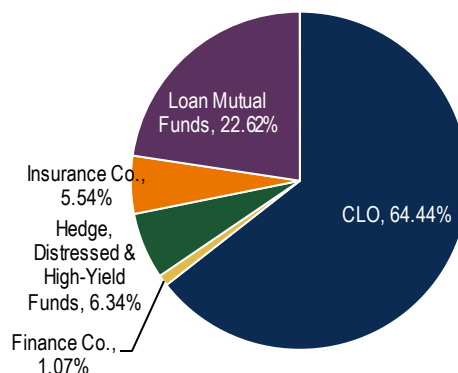
Sources of funds for the private credit market (~\$0.4-0.7tn) primarily include institutional investors as well as retail investors via BDCs (Business Development Companies), though there is less data available in the private credit market. The institutional funds and other vehicles tend to have locked up capital for 3-10 years, while the BDCs raise permanent capital in addition to some debt financing. Chart 15 provides some investor breakdown of the fund side of the private credit market.

Chart 14: Investors in the private credit fund market



Source: Preqin
Note: Represents comingled fund AUM captured by Preqin.

Chart 15: Leveraged loan market



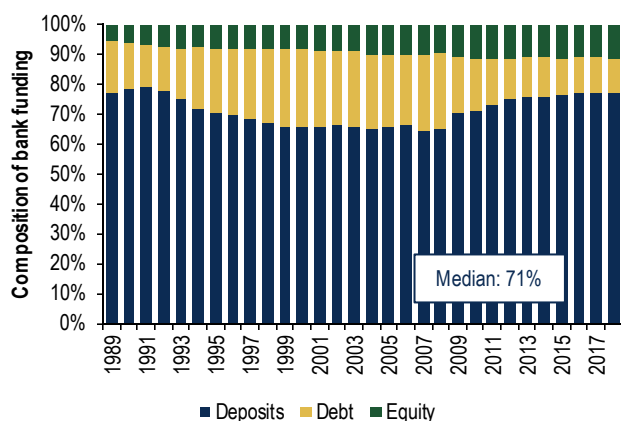
Source: Preqin

Funding is a competitive advantage for the banks

Banks remain deposit rich, with average cost of deposits at a mere 48bp as of 2Q18 vs. the current target Fed Funds rate in the 2-2.25% range. The primary source of funds for U.S. banks remains deposits, comprising 77% of total funding based on aggregate data for all FDIC insured institutions. We note that the current level of deposit funding is above the 71% long term historical average and compares to 65% the low hit during the '08-'09 credit crisis (see Chart 16 and Chart 17).

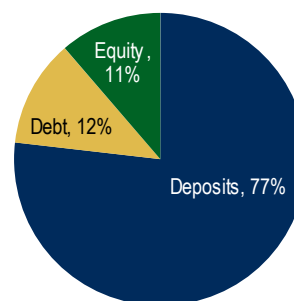
While rising interest rates are expected to push deposit costs higher for the banking industry, the relative funding advantage of the banks relative to nonbank peers is likely to widen in this environment. Wholesale funding sources are prone to exhibit high betas impacting the returns for nonbank peers. On the other hand, the rate paid on deposits is one of several reasons why a customer chooses to maintain a banking relationship. Other services such as the quality of treasury/cash management services (for commercial clients) or mobile banking technology (for retail clients) often outweighs the rate paid on deposits.

Chart 16: Historically deposits made up 71% of bank's liabilities...



Source: FDIC

Chart 17: ...today they represent 77%

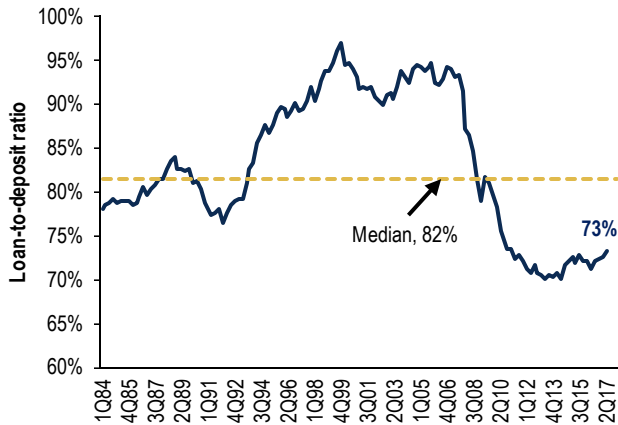


Source: FDIC

Despite normalizing interest rates, the banking industry still has robust levels of deposits, with 73c of loans for every dollar of deposits or lower than it has been historically (see Chart 18). As monetary policy continues to tighten, we expect some of these deposits to flow out of the system, pushing the loan-to-deposit ratio higher.

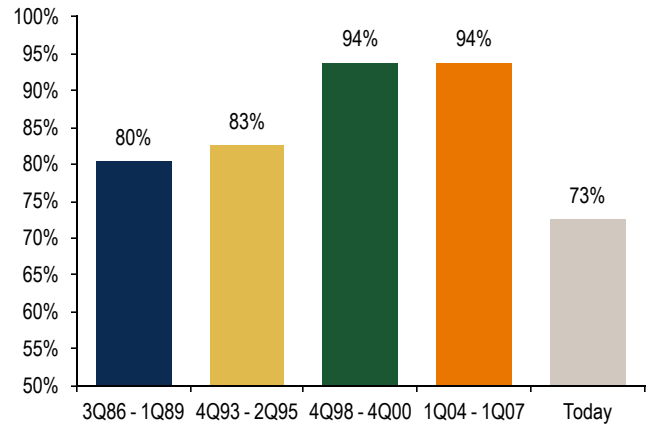
However, we note that liquidity requirements instituted after the '08-'09 financial crisis are likely to keep this ratio at lower levels vs. history (see Chart 19).

Chart 18: Industry loan-to-deposit ratio



Source: FDIC

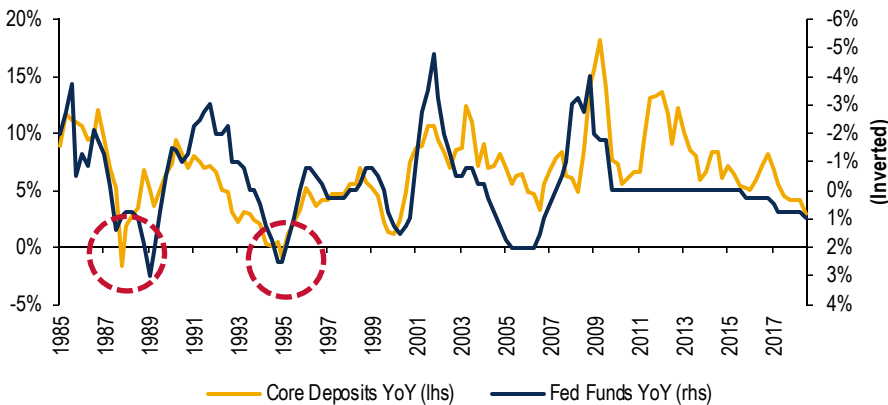
Chart 19: Loan-to-deposit ratio during prior rate cycles



Source: FDIC

Excess deposits typically drain out of the system when short rates rise (see Chart 20). Not surprisingly, we have seen US deposit growth slow as the Fed began its most recent rate hike cycle in Dec 2015. Moreover, after staying relatively subdued during the initial phase of this rate cycle, we expect competition for excess cash at consumer accounts to pick up – potentially leading to an inflection point in deposit betas. Given the higher value liquidity rules place on consumer deposits, we expect LCR (liquidity coverage ratio) impacted banks to be particularly competitive – and note that it is these larger banks that typically set the tone for deposit pricing in any given market. That being said, we note that while deposit growth has slowed during periods of rising interest rates, it has seldom gone negative.

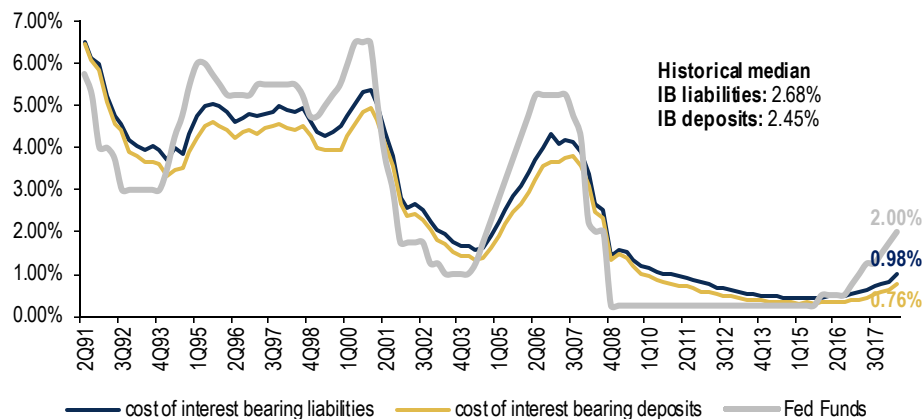
Chart 20: Deposit growth is inversely correlated with rising short rates



Source: Bloomberg, Federal Reserve (H.8 data)

Cost of funding has seen a secular decline for the banks over the last few decades as market interest rates have headed lower, improved economies of scale given industry consolidation. Historically, banks have tended to pass on about 48% of the increase in the Fed funds rate to their depositors over the course of a cycle. However, so far this cycle the industry has only passed through 20% of the increase in the Fed Funds rate to its customers. Deposit beta could remain subdued relative to history, especially if loan growth trends remain tempered relative to GDP growth.

Chart 21: Total interest bearing deposit and liabilities cost remain well below historical averages



Source: SNL Financial, Bloomberg

Note: data represents SNL Commercial Bank Index

Non-bank sector exposure: Technology and healthcare at the top

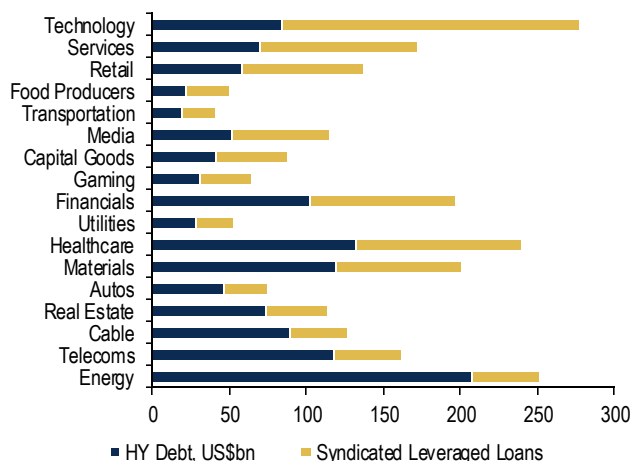
In the non-bank market, getting sector exposure can be challenging given the availability of data. Here are our best estimates. We show the sector distribution of leveraged finance debt (HY bonds + leveraged loans), ranked by proportion of total represented by loans. Overall, largest lev fin debt issuers are technology, energy, and healthcare. The sectors most heavily reliant on syndicated loans (as a percent of total indebtedness) are technology, services, and retail (see Chart 22).

The exposure of the private credit market is similar with the greatest exposure to the technology and healthcare sectors, but the mix tends to vary by year. (See Chart 23). Thus, we thought it would be more helpful to break down the exposure on an average basis since 2010.

Interestingly, these sectors heavily weighted in secured loans happen to be on the light end of distribution in terms of tangible asset coverage. This data point adds to the argument that recoveries in leveraged loan restructurings in the next cycle could be lower than historical experience would suggest.

Chart 22: Sector distribution of debt in leveraged finance

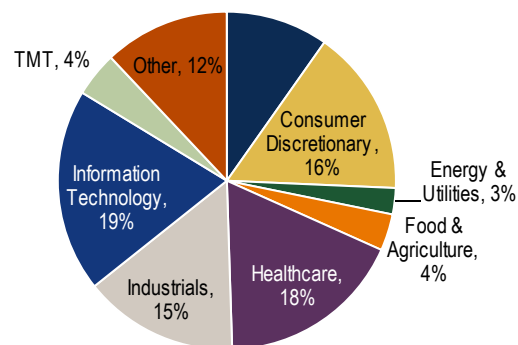
Ranked by proportion of total debt represented by loans



Source: Federal Reserve

Chart 23: Private debt sector breakdown

Average since 2010



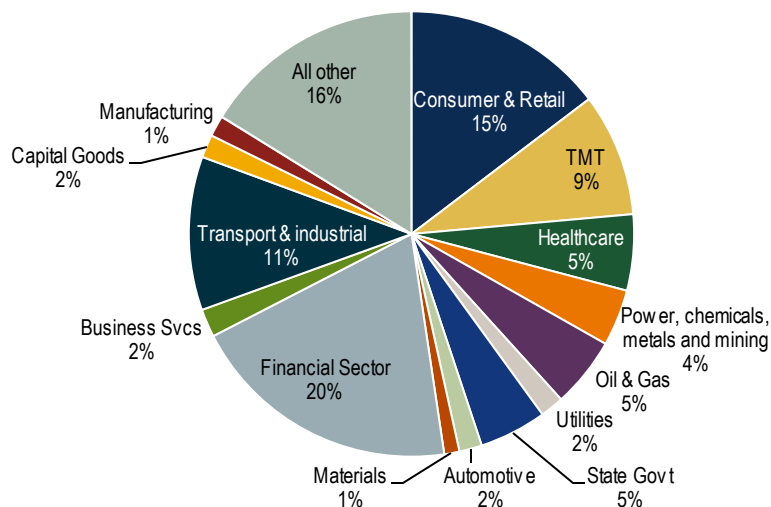
Source: Preqin

Note: Represents the number of private debt deals by industry, for comingled fund AUM captured by Preqin.

Banks' sector exposure: Financial sector and consumer exposure the greatest

Using the largest six lenders as a proxy, exposure to the financial sector (other banks, insurance, asset managers, etc.) appear to be the banks' top sector exposure in commercial lending (see Chart 24). Exposure to consumer and retail is the second highest exposure.

Chart 24: Bank sector exposure



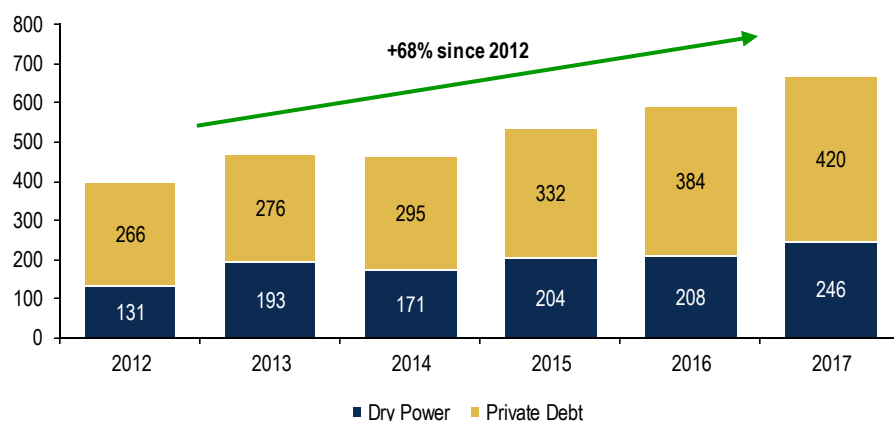
Source: Company data

The new frontier: Private debt

As a result of regulatory and competitive changes that we discuss in other sections, banks have stepped back from certain kinds of corporate lending (exacerbating the trend away from bank loans which started in the late 1990s), but also from dis-intermediating and syndicating certain types of loans. The capital markets have responded in a predictable way, by creating a new class of investors/vehicles, unconstrained by regulatory hurdles and designed to take advantage of bank's retreat. Risk takers and risk budgets have migrated from bank desks and balance sheets to private lenders.

As mentioned, the "private debt" market, which we define here as the segment of total U.S. non-financial debt space that is neither in a form of bonds, or bank-held loans, or broadly syndicated leveraged loans, has grown substantially over the past 5 years to reach \$400-\$700bn (see Chart 25).

Chart 25: Private debt has grown substantially over the past 5 years

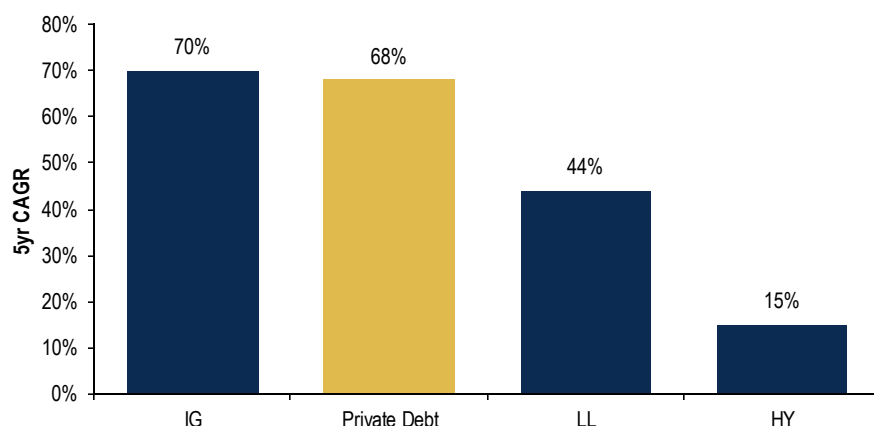


Source: Preqin

Among key participants in the private debt space are direct lenders – unregulated non-banking institutions/vehicles. Lending guidelines that may apply to banks do not necessarily apply to them. Another constituency is represented by BDCs, which are designed to facilitate capital formation for small and middle-market companies (usually private or public <\$250mn mkt cap) and account for about \$80bn in AUM. CLOs represent another source of capital for middle-market companies, accounting for \$50bn of middle-market funding.

This makes private debt one of the fastest-growing segment of U.S. corporate credit over the past 5 years, at +68%. By comparison, growth in other segments reached 70% in IG (investment grade), 44% in leveraged loans, and only 15% in HY (see Chart 26). Private debt growth experienced two distinct episodes of growth. First, in 2013-2015, as banks were focused on the implementation of most post-Global Financial Crisis, Basel III prudential regulatory measures (+\$200bn). Second, growth also accelerated over the past two years (+\$131bn), after major global central banks implemented negative interest rates and increased liquidity in the market place.

Chart 26: Private debt one of the fastest-growing segments of U.S. corp credit over the past 5 yrs



Source: BofA Merrill Lynch Global Research, Federal Reserve, Preqin

When public credit markets were shut down in late 2015/early 2016, direct lenders showed they were willing to provide capital, offering certainty of execution and pricing. They did so on their terms and with little competition.

A new industry of alternative investment managers has emerged to participate in direct lending. Preqin estimates the number at 322 funds, roughly a quarter of which debuted in the last five years. While early entrants in this space are represented by seasoned institutions such as Ares, Golub, Oaktree, Apollo, Blackstone and others, the number of new participants raises questions around their experience, ability to attract capital and build necessary analytical infrastructure (though the asset base is still relatively small).

Dry powder in private debt funds reached a record \$246bn earlier this year, according to the same source. This can lead to intense competition among money managers to deploy such capital, creating potential negative side-effects to quality of capital allocation process, so manager selection is important.

Certain banks, feeling the pressure from a new competitor on their historical turf, are also getting more aggressive in defending their lending business, offering competitive lending solutions to issuers who would otherwise borrow from direct lenders – mostly on rates. Their ability to do so remains constrained by the regulatory requirements. Notably, the big banks we have spoken with have noted pulling in the underwriting reins, but observing more aggressive competition on structure from larger regional banks.

Key risks attributable to the rapid growth in private debt

These competitive pressures lead to more aggressive deal structures and pricing. To win deal allocations, some managers come under pressure to provide higher leverage, accept looser documentation, or allow lower pricing.

Such rapid development of private debt lending potentially fits the description of a classic new hot market, which often results in unsustainable growth trajectories leading to eventual corrections, required to stabilize the market at longer-term sustainable levels.

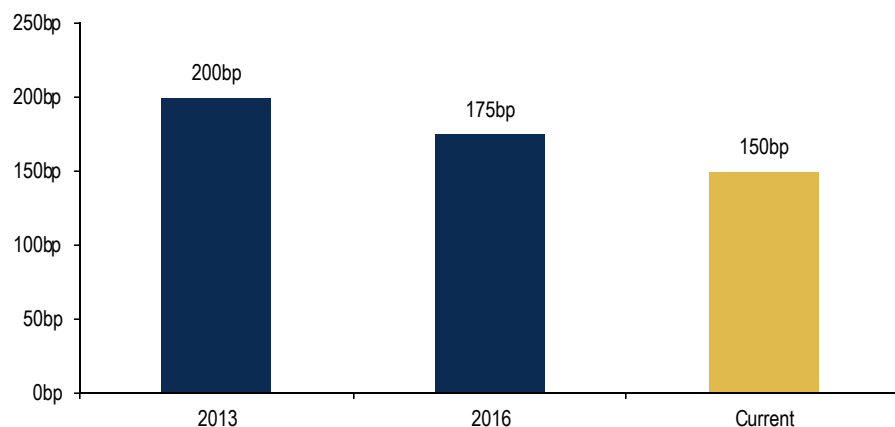
Strong growth in assets coupled with high levels of un-deployed capital leads to strong competition for credit-worthy borrowers. Such competition usually manifests itself in less attractive pricing terms as well as in the deterioration of investor protections, though protections are generally better than the syndicated market.

The private debt market is by definition less transparent. This makes it more difficult to judge the aggregate credit quality trends as well as aggressiveness of new deals in that market. Names in private debt portfolios are less likely to be followed by broader equity/credit analysts in other asset classes – this decreases the likelihood of early detection of negative fundamental trends.

Secondary trading liquidity of private and middle-market debt is meaningfully more constrained given their private nature and small size even under normal volatility circumstances. For all practical purposes, such liquidity should be expected to be minimal in a stressed market environment.

Management fees in private debt have come under pressure, reflecting the broader trend in other asset classes. According to Preqin, such fees are averaging 150bp here, vs. 200bp five years ago, and 175bp in 2016 (see Chart 27).

Chart 27: Management fees in private debt have declined ~50bp over last five years



Source: Preqin

Note: Represents median fee rates

Key mitigating factors that could neutralize the risks

Given smaller capital structures, a limited number of investors typically own the whole deal by themselves. This allows investors to dictate covenants and exercise greater degree of control over the issuer. In a hypothetical debt restructuring, such an investor could also face less of a risk of competing claims reducing asset pool.

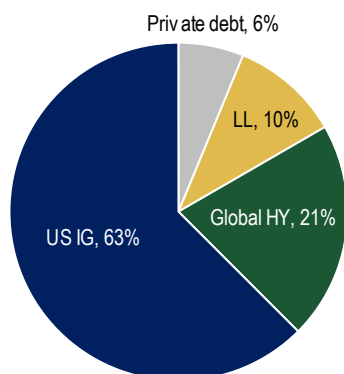
Middle market loans have a lower proliferation of standard “cov-lites” (absence of maintenance covenants) vs. the broadly syndicated loan market, and have tighter language around restricted payment baskets, asset sales and cash flow sweeps. EBITDA adjustments are also reported to be a less prevalent, but nonetheless appears to be growing problem. Anecdotal evidence suggests that covenants in middle market loans are generally stronger compared to overall leveraged loan market. Leverage in the middle market is estimated to be 5x-5.5x vs. 6.0x in syndicated loans. By interesting contrast, the lion’s share of banks limit their middle market exposure to 4.0x leverage.

Further, direct lenders often get better access to issuer financials (4Q reporting, sometimes even monthly), regular calls with managements.

The asset class is relatively small and the potential for spillover to broader credit may be limited. At \$400-\$700bn, the private debt space could be only 60% of the size of leveraged loans, 30% the size of global HY, and 10% the size of U.S. IG (see Chart 28). Assuming most vehicles that hold private debt are segregated from those holding public

instruments, a distress in the former should not have an immediate contagion effect on the latter.

Chart 28: At \$400-\$700bn, the private debt space could be only 60% of the size of leveraged loans



Source: BofA Merrill Lynch Global Research, Preqin, Federal Reserve

Having said that, we believe there is a limit as to how far these factors would mitigate a deep stress scenario. For example, given that most BDCs are trading in 8-10% yield range, yields could easily reach high teens or even 20%s, in a scenario where their prices were to drop substantially. This could lead to a flow of capital away from public debt markets and towards these newly created opportunities.

Illiquidity could have a mitigating side-effect, in that there will be fewer fire-sales that could otherwise set low price prints and become benchmarks for subsequent portfolio markdowns and further fire-sales. This factor does not change the underlying economic value of an asset, but it mitigates short-term price volatility.

In addition, poor liquidity could force better credit quality standards, as lenders know they are likely to own the deal to maturity. Absence of a realistic prospect of early exits through secondary markets forces lenders to adopt more conservative leverage requirements towards borrowers.

The structure of broadly syndicated loan market today also relies less on mark-to-market instruments and daily liquidity funds, which could help it experience more orderly price adjustment in the next downturn.

Direct lending funds typically do not use any leverage, or in some cases limit themselves to 1.5x-2x debt to 1x equity. BDCs can lever as high as 2:1 (recently increased from 1:1). CLOs could be levered up to 8x in middle-markets and 10x in broadly syndicated space, however their liabilities are fixed for the duration of the deal, limiting the risk of a forced unwind.

The actual use of leverage in direct lending funds remains modest: 43% use no leverage at all (fully financed with equity capital), while another 27% use less debt than equity (so 70% of universe is unlevered/low levered).

Standard loan retail mutual funds hold only limited allocations to middle market loans. We analyzed portfolios of largest funds representing 25% of total AUM in this segment,

and determined that less than 2% of their positions were in smaller-issuer loans. This limits the liquidity risk to their portfolios.

Structural vs. cyclical: The great debate

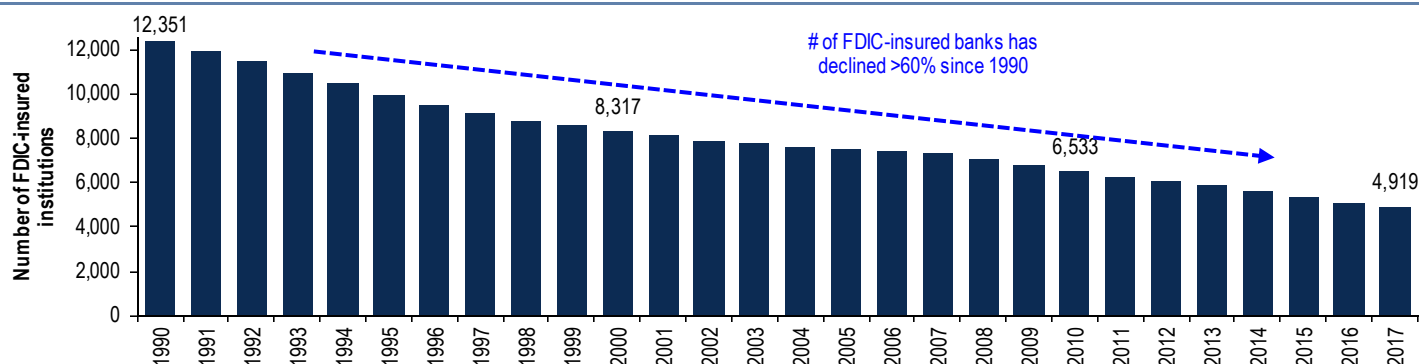
Given historically low interest rates, for longer, globally, many investors are wondering how much of the commercial lending share shift to non-banks from traditional banks is structural vs. cyclical. Particularly given the slower-than-expected pace of US regulatory reform in a Republican administration, we think there is a strong argument for structural factors. We think bank consolidation and stringent regulation has redefined client focus and risk taking for the industry. Further, the number of public companies has declined 40% over the past 20 years, while the number of private companies has increased 10% over the same period – suggesting a structural shift in demand for private debt. We note that (lack of) inflation and lower potential growth are two important considerations for interest rates. Both appear to be contributing to structurally lower rates.

Structural: Consolidation and concentration

As noted earlier, non-bank lenders have gained 400bp in market share since the Global Financial Crisis – notable, but not as significant as press reports would imply. This is because the share shift to non-banks from banks was happening long before. As a reminder, pre-Global Financial Crisis, bank commercial loan share was already down to 18%, implying that the most dramatic change in market share had happened pre-GFC.

Bank consolidation may have played a part in this long-term structural change. Since 1934, the number of FDIC-insured banks has declined 65% (see Chart 29). Using deposit market share as a proxy for overall market share, the top 5 banks hold 43% of market share today; in 1998, this share was 19%. In theory, as the market consolidates, larger institutions would look to win business with larger clients given bigger balance sheets and a greater ability expand the relationship (e.g., treasury management, capital markets), perhaps focusing less on middle market clients. Bank industry consolidation coincides with the shift in share in leveraged lending, and, as previously noted banks outside of the top 25 have actually gained share from big banks over a long period of time.

Chart 29: Number of U.S. banks has declined over 60% since 1990



Source: BofA Merrill Lynch Global Research, FDIC data

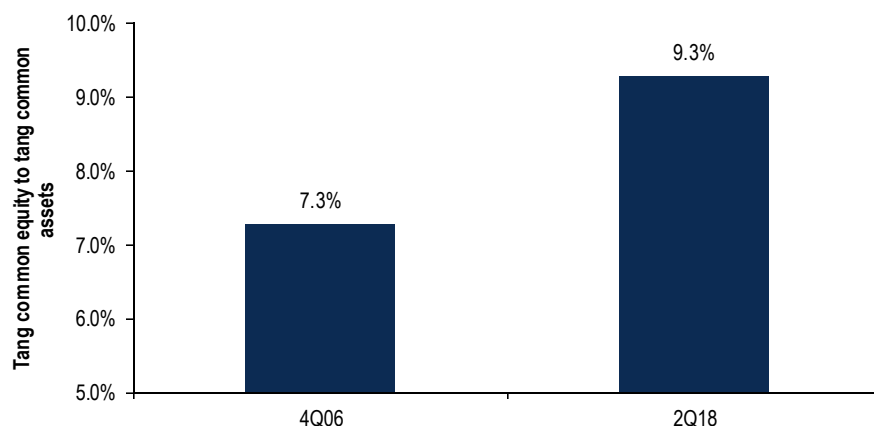
Structural: How post-crisis regulation changed the game

Of course, the material change in global prudential regulations following the Global Financial Crisis played a significant impact on risk-taking at banking institutions. In this section, we focus on the rules that would be most impactful to bank appetites for C&I lending. (For a detailed guide on post-crisis regulation, please see our [Global Regulatory Handbook 4.0](#).)

Comparing capital standards today vs. pre-crisis is not often a useful exercise, as many of the capital standards applied to G-SIBs (globally systemically important banks) simply

didn't exist until after the crisis. A more “crude” measure of capital – tangible common equity to tangible assets – nonetheless implies that banks have significantly more capital today than before the crisis (see Chart 30).

Chart 30: Industry TCE ratios



Source: FDIC

The most impactful prudential rule change to potentially impact C&I lending appetite is likely common equity tier 1 (CET1). After all, CET1 is the rule requiring that banks hold capital against risk-weighted assets (RWA). Under the standardized approach, C&I loans have a risk weight of 100% (see Exhibit 3). U.S. banks have two ways to calculate RWAs: standardized (pre-set risk weights) or advanced (model-based risk weights). However, according to the Collins Amendment, a bank is constrained by the higher of the two RWA results, or the lower of the two capital ratio outputs. Simply speaking, the rule precludes banks from modeling lower risk weights to its advantage, even if loss experience appropriately models a lower implied RWA.

Exhibit 3: Difference between standardized and advanced approaches for sample risk weights

	Standardized	Advanced
Secured financing	RWA based on collateral haircut approach	Determined by the likelihood of default and recovery given default, based on firm experience (could be below or above 100%)
US PSEs (including municipal securities)	20 or 50%	
Residential mortgage loans*	50%	
Home equity loans	100%	
HVCRE loans	150%	
CRE loans (term + construction)	100%	
Auto loans (consumer)	100%	
C&I loans	100%	
FI Trdg: Currencies & gold	RWA based on potential future exposure and counterparty	

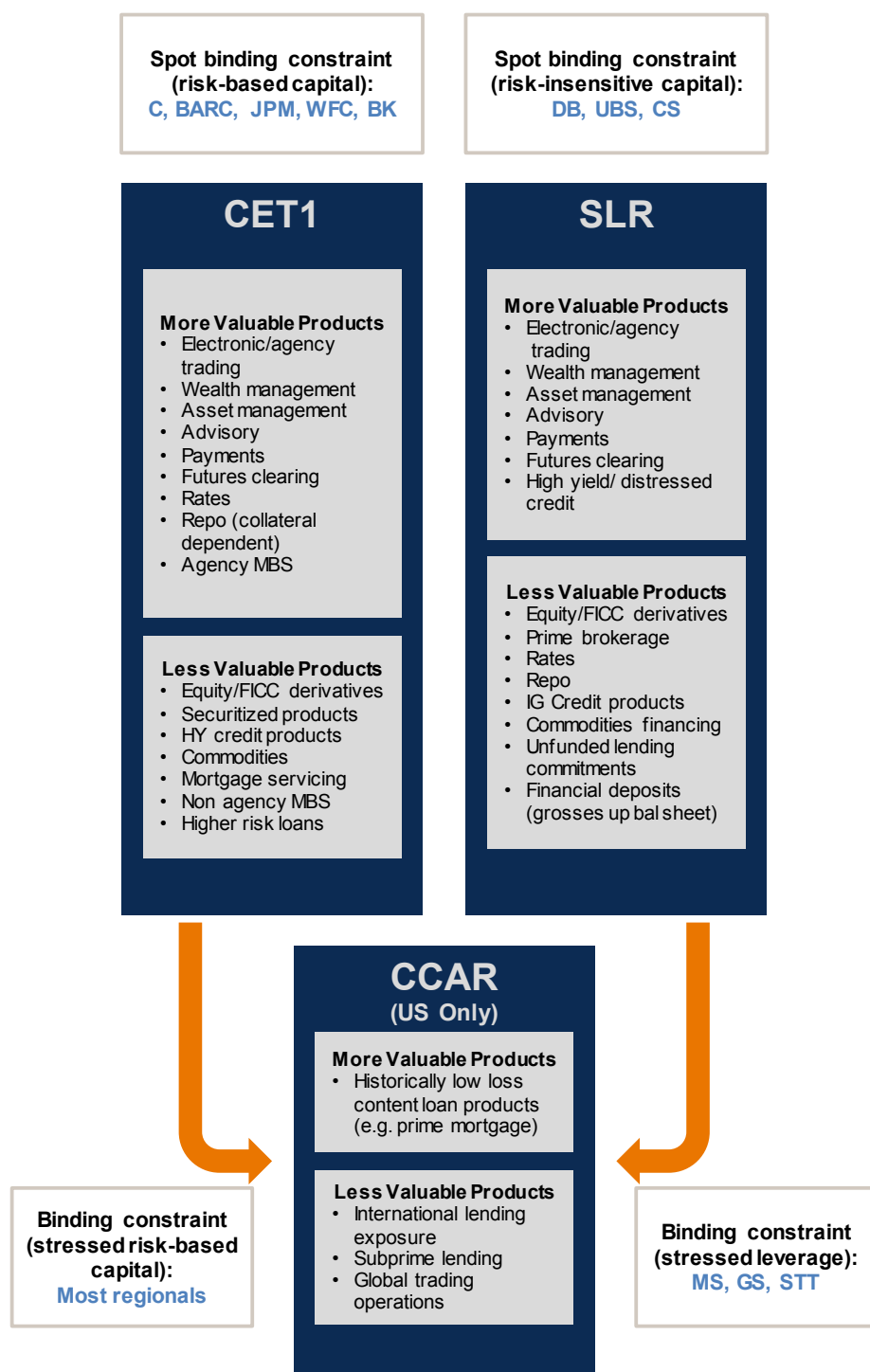
Source: BofA Merrill Lynch Global Research, Federal Reserve

Note: Asterisk denotes “prudentially written”

The two primary capital rules governing large banks are CET1 and SLR (supplementary leverage ratio) – the latter requiring the amount of capital against gross assets, rendering the requirement **risk insensitive**. As such, binding constraint is an important concept to grasp when anticipating risk appetites, as product-level “value” changes based on binding constraint (see Exhibit 4). Excluding the trust banks, four out of six U.S. G-SIBs are bound by CET1, while Goldman Sachs and Morgan Stanley are bound by

SLR. In other words, the four largest “traditional” balance-sheet C&I lenders are bound by a capital regime where higher risk-weighted assets are considered “less valuable.”

Exhibit 4: More- and less-valuable financial products under current capital requirement framework



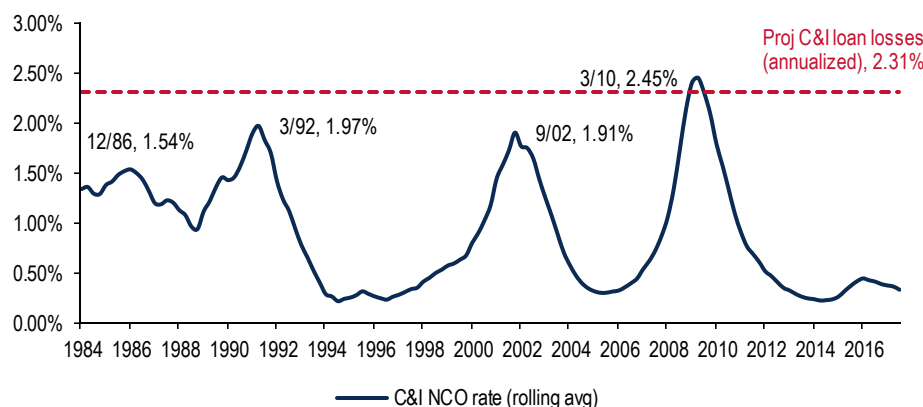
Source: BofAML Global Research, Federal Reserve

DFAST: An annual “mark to market” exercise for accrual-based loans

The U.S. stress test, or DFAST (Dodd Frank Act Stress Test), exacerbates some of this impact. The average annual C&I loss rate over the five-year history of DFAST is 2.3%; this compares to an actual historical peak of 2.45% in 2010, the highest of the previous

four observable economic down-cycles (see Chart 31). Note that stress test parameters change every year. In our view, this encourages consistent, lower-risk policies at banks.

Chart 31: The avg annual C&I loss rate under DFAST (2.3%) vs. peak of 2.45% in 2010



Source: Federal Reserve, FDIC

Note: Federal Reserve projects cumulative loan losses over a 9 qtr period.

Stressed capital buffer (SCB) proposal – de facto increase in standards?

Moreover, an April 2018 proposal from the (Trump) Fed looks to elevate the importance of stress test results – potentially de-facto raising capital standards. The CET1 standard is comprised of three sub-requirements: 1) the 4.5% minimum; 2) the risk-calibrated G-SIB surcharge, if applicable (currently ranging from 1.5-3.5% for U.S. banks); and 3) a capital conservation buffer of 2.5%. The Fed is proposing to replace the capital conservation buffer with the stressed capital buffer, or the net amount of capital each DFAST participant burns in the test (see Exhibit 5). The SCB cannot be less than 2.5% (or equal to the original capital conservation buffer), but has no upward limit.

Exhibit 5: Pro forma capital requirements under the Fed's proposal

Key	A	B	C	D	E = C - D	F	G	H	I = max [E-G-H or 2.5%]	J = A+B+F+I	K	L	M = K - J	N = L - J	O	P = O - J
	Minimum req	GSIB surcharge	CET1 ratio (4Q17)	Proj min CET1 ratio (DFAST '18)	Stress test losses (DFAST '18)	Add: Planned dividends	Less: RWA growth	Less: Capital Actions	Stressed capital buffer	Pro forma req	CET1 ratio "target"	Current min req	Target vs. pro forma	Current min vs pro forma	CET1 ratio (2Q18)	Spot CET1 ratio vs pro forma
G-SIBs																
JPM	4.5%	3.5%	12.1%	7.2%	4.9%	0.7%	0.4%	1.6%	2.9%	11.6%	11.5%	10.5%	-0.1%	-1.1%	11.9%	0.3%
C	4.5%	3.0%	12.4%	7.2%	5.2%	0.4%	0.4%	0.8%	3.9%	11.9%	11.5%	10.0%	-0.4%	-1.9%	12.1%	0.2%
MS	4.5%	3.0%	16.1%	7.3%	8.8%	0.6%	0.3%	1.6%	6.9%	15.0%	10.5%	10.0%	-4.5%	-5.0%	15.8%	0.8%
GS	4.5%	2.5%	11.9%	5.6%	6.3%	0.2%	0.2%	0.9%	5.2%	12.5%	10.5%	9.5%	-2.0%	-3.0%	11.5%	-1.0%
WFC	4.5%	2.0%	12.0%	8.6%	3.4%	0.7%	0.5%	1.5%	2.5%	9.7%	10.0%	9.0%	0.3%	-0.7%	12.0%	2.3%
BK	4.5%	1.5%	11.5%	9.0%	2.5%	0.7%	0.4%	1.9%	2.5%	9.2%	9.0%	8.5%	-0.2%	-0.7%	11.0%	1.8%
STT	4.5%	1.5%	11.6%	5.3%	6.3%	0.7%	0.1%	1.8%	4.5%	11.1%	10.0%	8.5%	-1.1%	-2.6%	11.3%	0.2%
Regionals																
BBT	4.5%	0.0%	10.2%	7.9%	2.3%	0.7%	0.4%	1.7%	2.5%	7.7%	10.0%	7.0%	2.3%	-0.7%	10.2%	2.5%
CFG	4.5%	0.0%	11.2%	6.8%	4.4%	0.4%	0.3%	0.8%	3.3%	8.2%	10.0%	7.0%	1.8%	-1.2%	11.2%	3.0%
FITB	4.5%	0.0%	10.6%	7.5%	3.1%	0.5%	0.4%	1.2%	2.5%	7.5%	10.0%	7.0%	2.5%	-0.5%	10.8%	3.3%
HBAN	4.5%	0.0%	10.0%	8.1%	1.9%	0.7%	0.4%	1.1%	2.5%	7.7%	9.5%	7.0%	1.8%	-0.7%	10.5%	2.8%
KEY	4.5%	0.0%	10.1%	6.8%	3.3%	0.5%	0.3%	1.0%	2.5%	7.5%	9.5%	7.0%	2.0%	-0.5%	9.9%	2.4%
MTB	4.5%	0.0%	11.0%	7.5%	3.5%	0.6%	0.3%	1.3%	2.5%	7.6%	9.5%	7.0%	1.9%	-0.6%	10.6%	3.0%
NTRS	4.5%	0.0%	12.4%	11.7%	0.7%	0.7%	0.6%	1.5%	2.5%	7.7%	8.5%	7.0%	0.8%	-0.7%	12.3%	4.7%
PNC	4.5%	0.0%	9.8%	6.4%	3.4%	0.6%	0.4%	1.4%	2.5%	7.6%	8.5%	7.0%	0.9%	-0.6%	9.6%	2.0%
RF	4.5%	0.0%	11.0%	8.1%	2.9%	0.5%	0.4%	1.3%	2.5%	7.5%	9.5%	7.0%	2.0%	-0.5%	11.0%	3.5%
STI	4.5%	0.0%	9.6%	6.6%	3.0%	0.5%	0.3%	1.3%	2.5%	7.5%	8.5%	7.0%	1.0%	-0.5%	9.7%	2.2%
USB	4.5%	0.0%	9.1%	7.5%	1.6%	0.6%	0.5%	1.5%	2.5%	7.6%	8.5%	7.0%	0.9%	-0.6%	9.0%	1.4%

Source: BofA Merrill Lynch Global Research, company data, Federal Reserve

Note: Stress test losses based on 2018 DFAST results which compares the CET1 ratio at 4Q17 to the Fed's projected minimum CET1 ratio under the severely adverse scenario. Planned dividends based on actual 2018 capital ask. "Target" CET1 ratio denotes management's publicly disclosed optimal CET1 ratio

Based on 2018 DFAST results, the SCB would raise standards for three out of eight G-SIBs, and for one regional bank. Unless the final rule is softened from the proposal and/or the DFAST standards change favorably in 2019 and beyond, the SCB could further generally curb bank appetite for risk. That said, we would note that banks would

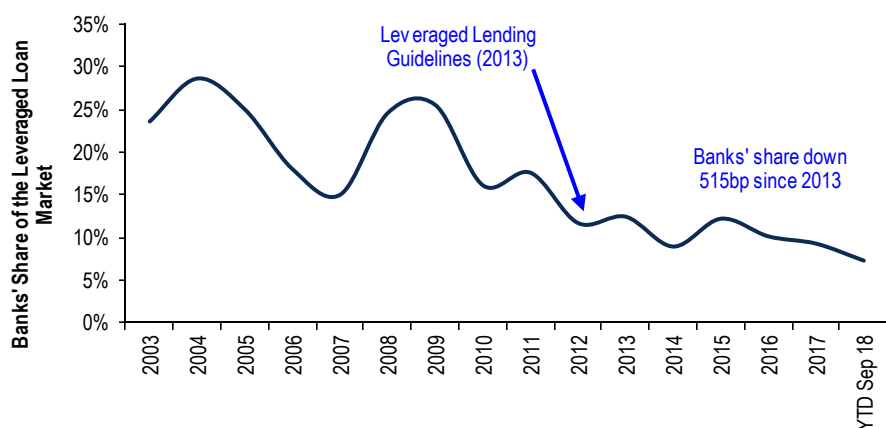
preserve capital first by easing buyback activity and dividend growth before lowering capital allocated to client growth.

Shift in interagency guidance on leveraged lending

In March 2013, the Fed, the FDIC, and the OCC published the “Interagency Guidance on Leveraged Lending”. The guidance allowed banks to set its own definition of a “leveraged loan”, but outlined four characteristics common to such loans, such as: 1) use of proceeds (i.e., buyouts, acquisitions, capital distributions); 2) total debt/EBITDA >4x or senior debt/EBITDA >3x (absent cash netting), or the appropriate amount of leverage applicable to specific sectors; 3) a borrower widely recognized by the market as a highly leveraged institution (high debt/equity ratio); and 4) post-close, pro-forma leverage exceeds industry norms or historical levels.

This was subsequently clarified by an interagency FAQ published in November 2014, which appears to have been more impactful to bank C&I growth than the guidance itself (see Chart 32). Key clarifications include citing a leverage level of 6x as a level that raises “concern” (though not a bright line test), noting that loans that meet one of the four common characteristics were not automatically considered as leveraged lending, and covenant-lite structures were still permitted, and the subsequent loan risk rating would be based on the borrower’s total financial picture. Banks we surveyed indicated that this caused them to broaden credit analysis and generally tighten standards, especially after the Nov. 2014 clarification.

Chart 32: Banks’ share of leverage lending most impacted by follow-up clarification to guidelines

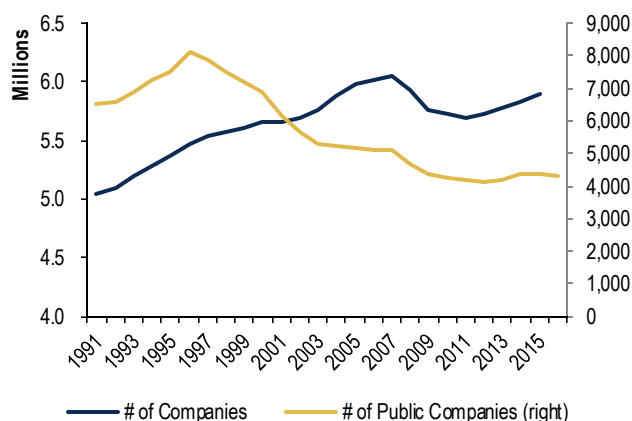


Source: Preqin

Structural: Private companies growing faster than public companies

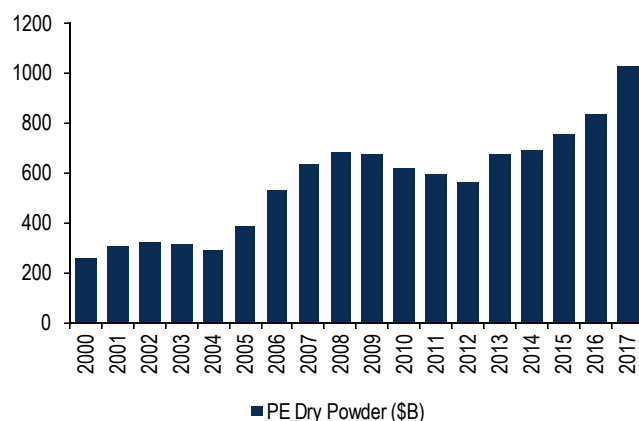
Another structural trend driving the growth in private credit specifically is the growth in private vs. public companies. Over the past 20 years the number of public companies is down nearly 40%, while private companies continue to grow. In addition, with PE dry powder at peak levels, we don’t see this trend stalling anytime soon (see Chart 33 and Chart 34).

Chart 33: Shrinking # of US public co's, growing number of privates



Source: U.S. Census Bureau, World Federation of Exchanges

Chart 34: Private equity dry powder has grown meaningfully (\$bn)



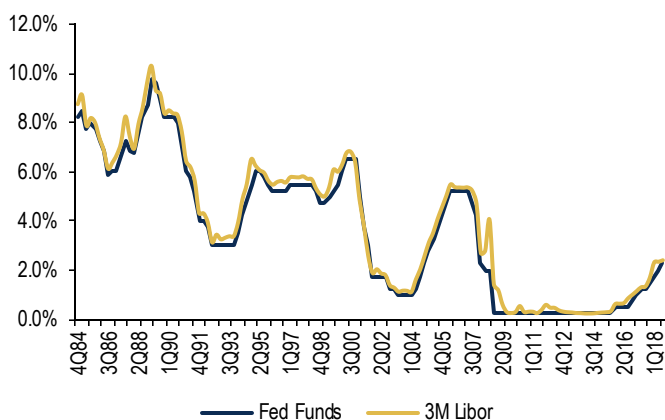
Source: Preqin

Cyclical: Global central bank policy of ultra-low rates

In addition to the structural factors discussed above, the easy money policies adopted by global central banks following the '08-'09 financial crisis have also likely played a role in fueling increased non-bank lending. At the short end of the yield curve, the US Federal Reserve and its counterparts in the UK, Europe and Japan pushed overnight interest rates at or near zero percent. These rates stayed zero bound for several years before the start of the current US interest rate cycle in 4Q15.

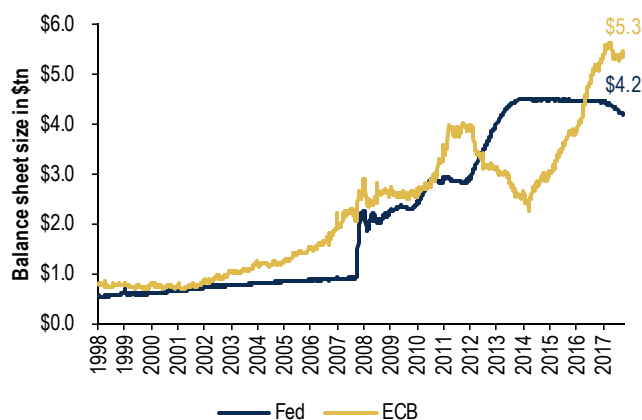
Additionally, the zero interest rate policy was supplemented by the introduction of quantitative easing (QE) which materially injected liquidity into the global financial system and pushed interest rates lower across the yield curve. The US Fed saw its balance sheet balloon from \$900bn pre-crisis to a peak of \$4.5tn in 2016 driven by the purchase of US Treasury and mortgage backed securities.

Chart 35: Fed funds rate vs. 3 month Libor



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 36: Fed balance sheet recovery



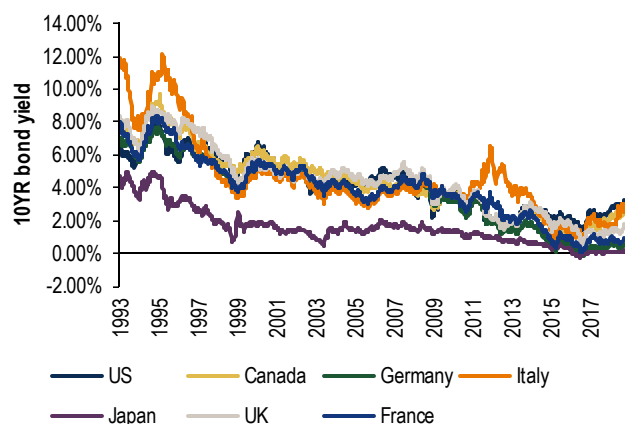
Source: BofA Merrill Lynch Global Research, Bloomberg

Ultra loose monetary policy pushed investors out on the risk curve and in search for yield as they looked for a suitable rate of return on their investments. While it is hard to segregate cyclical vs. structural drivers, the growth in the CLO (collateralized loan obligations) market over the last few years has likely been aided by the low interest rate backdrop with global risk free rates averaging 147bp between 2013-17 vs. 336bp average in the previous ten years.

From 2013-17, the U.S. CLO market almost doubled in size, growing from \$271bn to \$501bn. Among other reasons, investors have been drawn to U.S. CLOs by their strong

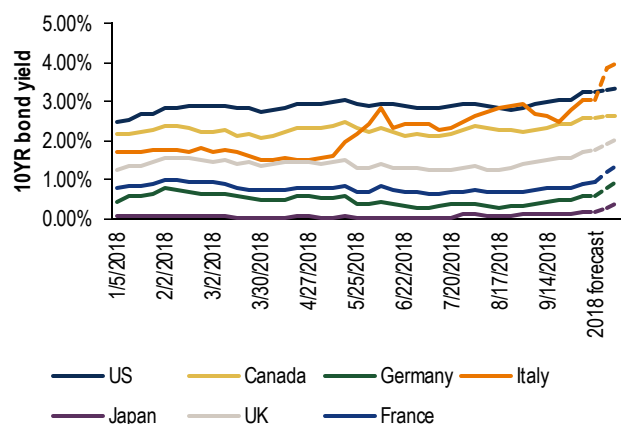
track record during the '08-'09 credit crisis and wider spread levels relative to like-rated corporates and other securitized products. We note that CLO issuance has declined since the \$150bn peak in 2015. However, activity remains at relatively robust levels with BofAML's CLO Strategy team forecasting issuance of \$120bn for 2018. Moreover, rising interest rates could support investor demand for CLOs given the floating rate loans (LIBOR based) underlying these securities. Conversely, a compression in the CLO arb spread in a rising rate backdrop could restrict CLO supply. Moreover, a steady rise in interest rates (increasing investment alternatives) or increased concerns around a potential credit downturn could temper investor appetite and lead to a drop in issuance over the coming years.

Chart 37: Global "risk-free" rates on the decline since 1993...



Source: Bloomberg

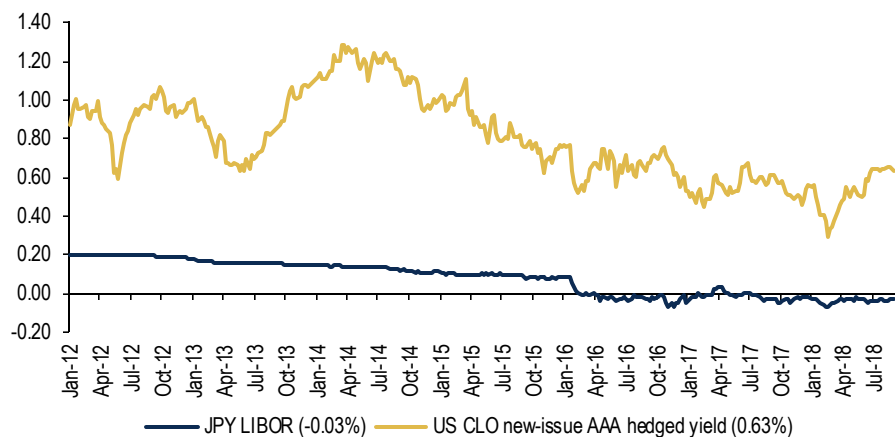
Chart 38: ... but projected to begin rising



Source: Bloomberg

We also note that the appetite among foreign investors has played a role in fueling the CLO boom given the differential in yields between U.S. and non-U.S. developed markets. As noted below there has been a wide spread between the Japanese Libor and CLO AAA hedged yields. As a result, Japanese investors stand to pick up an attractive yield even on a currency-hedged basis as compared to options back home. While some of this is structural given the aging demographics in Japan that is causing a search for yield (which we discuss in the next section), there is a cyclical component as well driven by the low rate environment following the '08-'09 credit crisis.

Chart 39: There has been a wide spread between the Japanese Libor and CLO AAA hedged yields



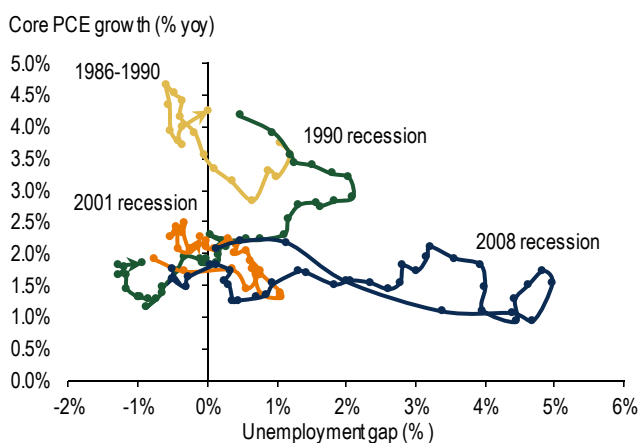
Source: Bloomberg

Cyclical-turned-structural: (Lack of) inflation, lower potential growth

Inflation and potential growth are two important considerations for interest rates, and both are contributing to structurally lower rates. First, on inflation: there has been a general downtrend in inflation since the 1980s high-inflation era. The most important driver has been the increasing influence and effectiveness of the Federal Reserve in managing the business cycle and inflation, albeit with some major road bumps along the way. And we believe there is little reason to expect a reversal upwards due to these factors:

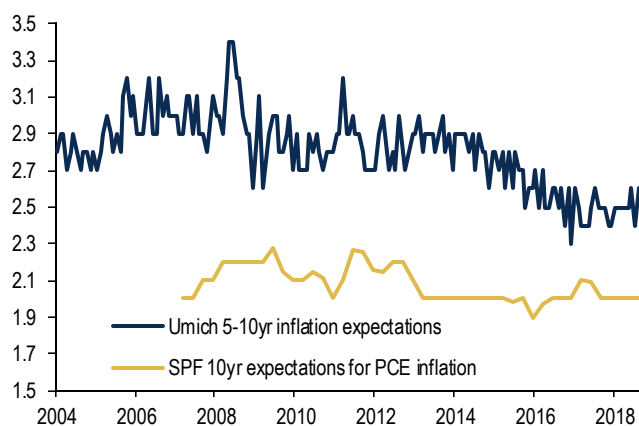
1. **The Phillips curve has flattened:** the standard cyclical inflation response to low unemployment has diminished over time (Chart 40). In addition, [the empirical data do not point to a dramatically steeper curve as the labor market tightens further](#).
2. **Anchored inflation expectations:** inflation expectations have drifted lower over the course of the cycle as inflation persisted below the Fed's 2% target. We have seen some recovery in recent years, but expectations generally remain lower than the prior expansion (Chart 41).
3. **Globalization and technological changes:** the globalization of supply chains coupled with disruptive forces from new technologies have likely contributed to more contained, stable inflation.

Chart 40: The Phillips curve has flattened



Note: unemployment gap is unemployment rate less NAIRU estimate from Congressional Budget Office (CBO). Source: BofA Merrill Lynch Global Research, Bureau of Economic Analysis, Bureau of Labor Statistics, CBO

Chart 41: Inflation expectations have drifted lower during the cycle

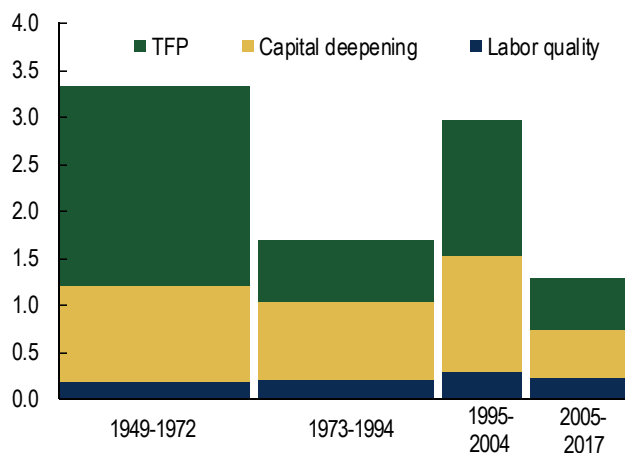


Source: University of Michigan, Philly Fed

Various metrics indicate that labor markets have gotten tight and businesses are dealing with rising input costs. That said, given the above we do not think we are in for an inflation scare, and anticipate core inflation will only gradually overshoot the Fed's 2% target in the near term before settling around the target over the longer run. Given the outlook, low and stable inflation will likely translate into little upward pressure on yields and weigh little on investor appetite for yield products.

Potential growth in the U.S. has also declined over time. Potential growth is correlated with real rates (also known as r^*), thus the slowdown in potential has contributed to structurally lower rates. The key driver has been productivity. We have been operating in a low productivity environment since before the last recession, and [in our view the prospects for a return to a high-productivity regime in the near term seem limited](#). Innovation in robotics and artificial intelligence, adoptions of big data and machine learning analytics are some of the possible avenues for a productivity pickup, but we believe the broad diffusion of these technologies will take years if not decades.

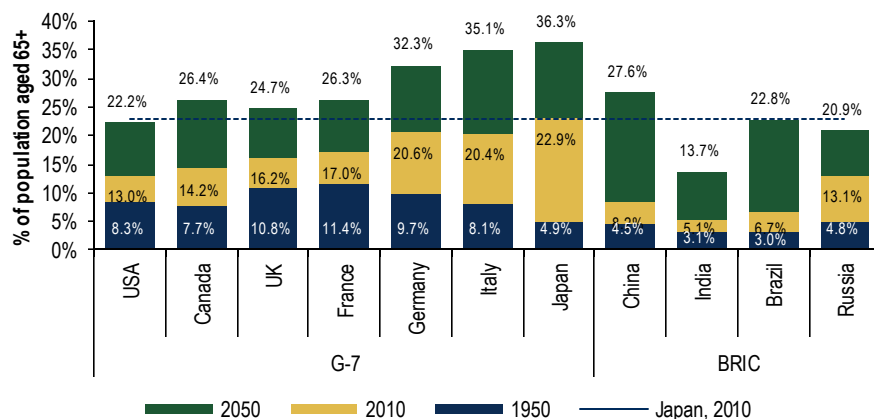
Chart 42: US labor productivity growth and its sources (%yoy)



Source: BofA Merrill Lynch Global Research, Bureau of Labor Statistics

The US is also dealing with an aging population, which has been an additional headwind for potential GDP growth. Census Bureau population projections predict these adverse trends to continue over the medium term as more of the Baby Boomers retire. Demographics also contribute to lower long run interest rates through greater demand for yield products (see Chart 43).

Chart 43: By 2050, populations around the world will be as old as Japan is today



Source: UN WPP 2015 revision

Investor protections: Lev fin, private debt

Syndicated leveraged loans have continued to attract investor interest in the last couple of years, as their investment thesis (significant yield pickup coupled with no interest-rate sensitivity) remains appealing to many. As a result, the leveraged loan market has grown by 19% in the last two years mostly through continued near-record issuance of CLOs and continued inflows into institutional and retail funds. This compares to a flat size of U.S. HY over the same interval (see Chart 44).

Chart 44: Syndicated loans as a pct of leveraged finance debt



Source: Federal Reserve

With strong demand for loans in recent years, asset managers have to compete on two scales: pricing and investor protections. The ability of CLO managers to compete on price is limited as their debt liabilities require minimum portfolio income generation. As such, some managers could be more inclined to compete by accepting looser investor protections for the same price.

A typical CLO ramp-up period includes a warehousing stage that could last for about six months. During this stage, new loans are being acquired as a collateral for the future CLO deal, and an equity investor in a warehouse facility carries the risk of market conditions moving against them during this ramp-up period. Therefore, equity investors are incentivized to close the ramp-up period as soon as possible.

This pressure is counterbalanced by established time windows on CLO warehousing facilities, which arguably allow managers some flexibility to bypass on deals they view as particularly unattractive. The choice of a CLO manager could depend on how quickly such manager is expected to complete this stage. There is a premium associated with well-established managers. In some cases, CLO manager and equity investor are the same entity.

Pressure to ramp up a portfolio for future CLOs at the time of record CLO issuance volumes puts some managers in a position where they are forced to compete on the strength of investor protections for a given level of credit risk/coupon.

Retail funds also contribute to excess demand for loan product as they continue to see inflows. YTD 2018, loan funds are seeing a 10% inflow, compared to a 9% outflow from HY funds. Loan funds have higher tolerance towards lower quality (B2/B3) paper compared to CLOs.

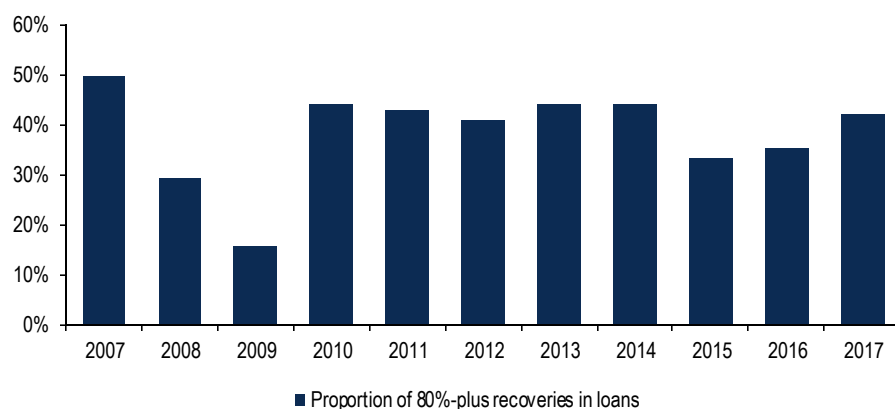
While there are some natural limits on how aggressive non-banks can be on pricing (via pricing floor on their liabilities), there are no immediate consequences to accepting looser covenants. When default rates are low (like today), the impact from looser covenants through lower loan recoveries is negligible. This would likely change, once default rates increase in the next credit cycle.

Key risks: Ongoing, meaningful deterioration of investor protections

Strong competition in the new CLO/loan asset management space in the last few years led to deterioration in key investor protections, such as restricted payments, asset sales, EBITDA add-backs, and incremental debt capacity.

These covenants are critically important to recovery in case of default, as they are capable of directly affecting the pool of assets available to creditors in bankruptcy, and the extent of creditors' ability to establish claim over it vs. unsecured and equity investors.

Chart 45: Proportion of 80%+ recoveries in leveraged loans



Source: Federal Reserve

Loan recoveries, defined as post-default trading prices, averaged a relatively high 65% since 2007 as a function a large proportion of loans recover near-par in restructuring. Tight covenant packages helped them achieve stronger controls over asset pools in bankruptcy or other distressed resolution.

This may change in the next cycle as key covenants have been eroded in recent years. Assuming the proportion of near-par recoveries is cut in half, the average first lien loan recovery rate could drop to low-50s%. For example, on a \$1.1tn loan market size with 15% peak default rate and 15% undershoot in recovery (50% vs. 65% historical), this is an equivalent of \$25bn of capital being permanently wiped out purely as a function of poor covenants. The next credit cycle is likely to bring some very poor recovery prints in certain most aggressive capital structures. We discuss various scenarios for defaults/recoveries later in this report.

Definitions of certain key covenants:

Structural subordination: Protection against lien dilution or structural subordination for existing lenders.

Restricted payments: Protection against cash leakage and value transfers that depletes value of associated collateral.

Debt Incurrence: Protection against issuers leveraging up or paying other debt-holders at the detriment of existing lenders.

Investments: Protection against issuer taking on risky investments through carve-outs and builder baskets.

Asset sales: Protection for lenders to enable them to benefit from asset sale proceeds and excess cash flows.

Covenants are particularly weak in the broadly syndicated loan market, where the competition for new deal allocations is high. The private/direct lending space has also seen some deterioration in investor protections, but to a lesser extent than what we have seen in the syndicated transactions.

Key mitigating factors that often get misinterpreted by market observers

Not all loans lacking covenants carry the same risk of low recovery. “Cov-lite” is not a new term, as it was coined at the end of last credit cycle, in 2006-07, when a growing number of new loans were coming in without a maintenance covenant. In such cases, issuers were not required to adhere to leverage tests once the loan was issued. We have long found this particular covenant mundane, as the experience of multiple breached maintenance covenants has demonstrated that lenders generally reserved their right to declare technical default, and instead chose to provide waivers for a fee.

Post-Global Financial Crisis, the number of such “cov-lites” has grown to vast majority of new leveraged loans by around 2013. So again, this is not a new development. In our view, the “cov-lite” label muddies the waters of a real problem for the next credit cycle, which is epitomized by the new structures lacking other, more crucial key covenants.

Bank underwriting: Tighter and tighter

It is difficult to directly compare bank underwriting standards with that of non-banks and even among a group of banks. That said, we were able to summarize our conversations with banks under coverage to determine general standards industry wide C&I loans. As expected, bank underwriting standards appear tighter than that of nonbanks, and color from management teams implies that standards for leveraged loans tightened even more in 2013 and 2014, after the aforementioned leverage lending guidance came out from three US regulatory agencies.

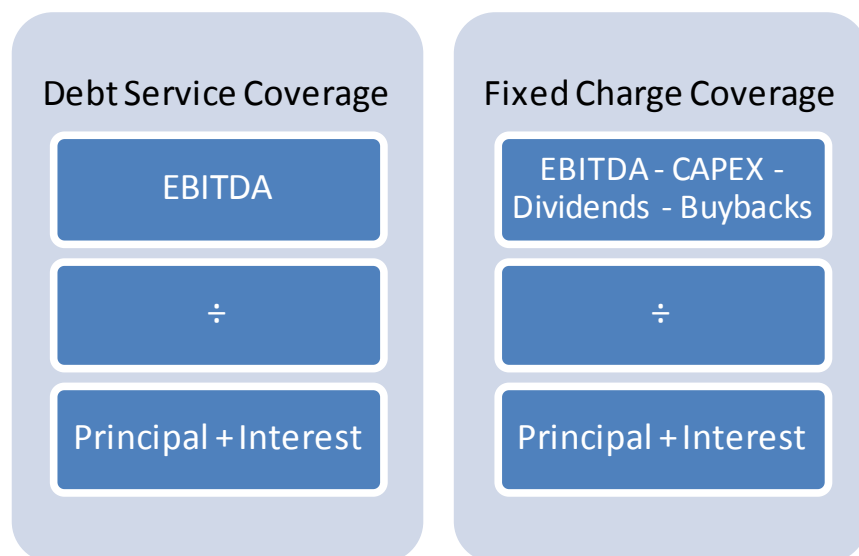
For example: “debt service coverage” as defined by a bank can be different from nonbanks. Nonbanks and investors in these products tend to look at the result of EBITDA over fixed obligations (principal and interest) to define debt service coverage. Meanwhile, banks tend to analyze “fixed charge coverage,” a more encompassing view of cash flow that take into account CapEx spend, cash taxes, regular (ongoing) dividends, and share repurchase (see Exhibit 6). In other words, the bank definition of cash flow is generally stricter.

We summarize the color from banks by loan structure:

- **Leveraged lending.** Given that most banks employ an originate-and-distribute model (realizing fees rather than interest income), the major restriction on this asset class is the leverage limit (6x or below is the OCC guidance). For many banks, this business was the most impacted by the 2013 and 2014 regulatory guidance. Typically, the first and second lien term loans provided are sold to the secondary market, and the remaining risk to the bank would be the undrawn revolver.
- **Sponsor finance.** Aside from capital call lines, banks offer sponsors LIBOR-based, term facilities for sponsor-backed transactions that remain on bank balance sheets. These loans may have a maturity profile of 5-6 years. The maintenance fixed charge coverage (which as a reminder is much tighter than debt service coverage) floor is typically 1.25x, with leverage restrictions up to 4.0x. Large banks noted that this business has become a much smaller part of their balance sheet, due to competitive issues.

- **Middle market lending.** Banks typically look for leverage of 4x or lower, with fixed charge coverage of 1.2x at origination for these LIBOR-based loans. A fixed charge coverage < 1x would cause a bank to classify the loan as a criticized loan. Additionally, banks tend to look at ~85% collateral coverage (e.g., accounts receivable, inventory, real estate); otherwise, additional restrictions kick in. Notably, banks require 1-2 financial covenants on a middle market loan. For loans to large-cap companies, banks have observed some non-banks (and some regional banks) waive leverage covenants.

Exhibit 6: Difference between debt-service coverage ratio and fixed-charge coverage ratio



Source: BofA Merrill Lynch Global Research

Parallel stress test: Nonbank losses higher

The primary question we get from both equity and fixed income investors related to this topic is: how bad are the loan losses going to be in the next cycle? In general, we believe the on-balance sheet C&I loans will have lower loss/charge-off rates (default times severity, or the inverse of recovery) than leveraged loans or private middle market loans in a stressed environment, though they also have lower income. These loss estimates include only permanent, or credit-related, losses for non-bank sourced loans, and do not take into account temporary, or liquidity-related, losses. (Though, we do arrive at an estimate for liquidity marks in our detailed analysis.)

Note that we stress-tested on an industry level, not in a bottom-up manner by bank or by credit. As such and importantly, there will likely be outperformers and underperformers of individual banks, individual managers, and individual credits.

In order to answer this question, we separately stress-tested: 1) non-bank leveraged lending; 2) non-bank private middle market; and 3) on-balance sheet bank C&I loans. For banks and bank investors, we then further sensitized earnings power and book value.

We sensitized losses under the following scenarios:

- **Scenario #1: Normalized case** – We define “normalized” as a parallel move in fed funds and LIBOR of +100bp. We then look at long-term averages for default and recoveries; in the banks’ case, the long-term average for net charge-offs in C&I. We think this is a likely near-term scenario for front-end rates. That said, if front-end rates are normalizing moderately, we think losses can generally remain below average, as this would imply a strong U.S. economy and scant cash flow issues.

- **Scenario #2: Stressed case** – We define “stressed” as a mild recession, more akin to the early 2000s recession than the Global Financial Crisis. Nevertheless, we assume fed funds decline 212.5bp to 0%, and that LIBOR moves down in parallel. (We do not assume that the Fed expands its balance sheet.) ***We think the next cycle will most likely resemble the backdrop we used for this scenario.***
- **Scenario #3: Severely stressed case** – This is defined as a severe recession. Like in the stressed case, we assume fed funds go to zero (but not negative), and LIBOR declines by the same amount. We assume the Fed will use its balance sheet, as in the Global Financial Crisis, to support liquidity and the economy. For bank stress, we look to the Fed’s DFAST scenarios under the severely adverse case, rather than using the Global Financial Crisis, as a reference point for losses (but not pre-provision net revenue, where the gap between the Fed model and banks’ co-run models tend to be wide).

Bank sensitivity: An earnings, not major book value, event

Scenario #1: +100bp move in LIBOR, “average” loss rates

Our primary conclusion here is that, when isolated, a 100bp move higher on front-end rates would not be enough on its own to upend debt service coverage or DSC (using a basic definition of EBITDA/principle + interest rate obligations). For bank loans, coverage ratios would be stressed to 4.8x (see Exhibit 7). By comparison, for leveraged loans, “stressed” DSC would be 2.9x, and 2.5x for private nonbank direct lending. It would take another 900bp of rate hikes for DSC to be at 1x for private nonbank loans, and another 15% of rate hikes for bank C&I loans to approach 1x.

Exhibit 7: Bank vs. non-bank sensitivity under +100bp parallel shift in rates

	HY Bonds	Leveraged, Syndicated Loans	Private Debt	On-bank bal sheet C&I loans
Pct Floating	25%	75%	95%	
Fixed Coupon	6.65%	6.08%	7.75%	
Floating Coupon (over Libor)	3.90%	3.33%	5.00%	
Current				
Libor		2.40%		
Weighted Average Coupon (w/ Libor)	6.56%	5.82%	7.42%	C&I Loan Yields 4.25%
Total Debt, US\$bn	\$1,200	\$1,100	\$700	Total R2K Debt, US\$bn 979
LTM EBITDA, US\$bn	\$255	\$183	\$127	LTM EBITDA, US\$bn 245
Int Expense, US\$bn	\$79	\$64	\$52	Int Expense, US\$bn 42
Leverage Ratio	4.7x	6.0x	5.5x	Leverage Ratio (x) 4.0
Coverage Ratio	3.2x	2.9x	2.5x	Coverage Ratio (x) 5.9
+100bp Fed funds				
Libor		3.40%		Est. C&I Loan Beta 95%
Weighted Average Coupon (w/ Libor)	6.81%	6.57%	8.37%	C&I Loan Yields 5.20%
Total Debt, US\$bn	\$1,200	\$1,100	\$700	Total R2K Debt, US\$bn 979
LTM EBITDA, US\$bn	\$255	\$183	\$127	LTM EBITDA, US\$bn 245
Int Expense, US\$bn	\$82	\$72	\$59	Int Expense, US\$bn 51
Leverage Ratio	4.7x	6.0x	5.5x	Leverage Ratio (x) 4.0
Coverage Ratio	3.1x	2.5x	2.2x	Coverage Ratio (x) 4.8

Source: BofA Merrill Lynch Global Research

Note that we used the Russell 2000 as a proxy for banking clients; this is what we stressed in the rate shock analysis to look at “stressed” coverage ratios.

Bank sensitivity to normalize: 25% earnings hit, book value still growing

For our earnings and book value sensitivity analysis, we spread the analysis over two years, or the average historical duration of a credit cycle. Under the “normalized” scenario, we see an earnings hit of 28% on Year 1 and 25% by Year 2 (see Exhibit 8). Book value would not be eroded and would in fact grow modestly; a key assumption that

we make is that dividends are held constant at current levels (and banks would still be earning at a pace greater than dividend payments), but repurchase activity is ceased.

As mentioned, we used the through-the-cycle net charge-off average in C&I. We then assume a 1.79% ending reserve relative to C&I loans (in-line with historical average), and kept losses and reserves on other loan categories constant.

To analyze the banking industry's sensitivity to +100bp in front end rates and "normalized" or through-the-cycle average charge-off rates, we use LTM (last twelve months) aggregate earnings as a base in all scenarios. We then assume modest net interest income growth of 3% over 2 years, in-line with our annual '19 estimate. (We assume that deposits re-price faster than loans from here.)

Exhibit 8: Scenario analysis under "normalized" conditions

Normalized Scenario	"Base"	Year 1	Year 2	2yr chg	Notes
Net interest income	522,652	529,545	536,970	3%	Assumes 3% cumulative growth
Total noninterest income	262,436	262,436	262,436		
Total noninterest expense	456,087	456,087	456,087		
Pre-provision net revenue (PPNR)	329,001	335,895	343,319	4%	Assumes long-term average NCO rate, weighted by loan type
Provision for loan and lease losses	51,318	134,528	134,528	162%	
Est. net charge-offs		90,343	90,343		
Net charge-offs to avg. loans	0.52%	0.96%	0.96%		Assumes long-term avg. reserve ratio for C&I loans, all else consistent with LTM
Provision to avg. loans	0.54%	1.43%	1.43%		
Loan loss reserve ratio	1.25%	1.70%	2.15%		
Est. C&I reserve ratio		1.79%	1.79%		
Pre-tax income	277,683	201,367	208,791	-25%	Assumes 1H18 tax rate (wtd.)
Estimated tax rate (wtd. avg. of 1H18)	21%	21%	21%		
Applicable income taxes	59,631	43,242	44,837		
Net operating income	218,052	158,124	163,955		
Estimated impact from higher C&I losses vs. LTM	-	-27.5%	-24.8%		
Tangible book value	1,579,104	1,579,104	1,579,104		Assumes no change to dividends paid
Add: Net operating income	-	158,124	163,955		
Less: Dividends	-	134,664	134,664		
Less: Share repurchase	-	0	0		
Pro forma tangible book value	1,579,104	1,602,564	1,608,395	2%	
Estimated impact from higher C&I losses vs. LTM	-	1.5%	1.9%		

Source: BofA Merrill Lynch Global Research, FDIC

Scenario #2: "Stressed" or mild recession; fed funds to zero

In this scenario, the bank earnings hit is severe, but book value is only eroded by 1% on a cumulative basis.

Bank sensitivity to stressed scenario: 50% earnings hit, flat book value

Under the "stressed" scenario, we see an earnings hit of 40% on Year 1 and 48% by Year 2 (see Exhibit 9). Book value would decline very modestly by 0.3% in Year 2, and 1.5% by Year 2. Again, we did not shut off or reduce dividends, but we did shut off buybacks.

In order to stress test losses, we averaged the peak charge-off rate in C&I from the previous four credit cycles, occurring in 1986, 1991, 2002, and 2009. We then applied peak reserves to the C&I portfolio. We similarly held losses and reserves constant in the other portfolios, though we recognize that is unlikely the realistic scenario even in a mild recession. However, we wanted to show investors the isolated impact of higher C&I losses.

To reflect the Fed reducing its target rate to 0%, we estimate a decline in net interest income by 5% in Year 1 and another 3% decline in Year 2. This is in contrast with the material net interest income growth experienced when the Fed last cut rates – due to the material opportunity to cut deposit rates. Given an industry level deposit rate of 55bp, there is a very limited ability to defend net interest income against rate cuts.

Exhibit 9: Scenario analysis under stressed conditions

Stressed scenario	"Base"	Year 1	Year 2	2yr chg	Notes
Net interest income	522,652	496,519	481,624	-8%	Assumes 5% decline in Y1, followed by a 3% decline in Y2, consistent with historical trends
Total noninterest income	262,436	262,436	262,436		
Total noninterest expense	456,087	456,087	456,087		
Pre-provision net revenue (PPNR)	329,001	302,869	287,973	-12%	Assumes 3.5% cumulative C&I losses, consistent with historical trends (all else equal)
Provision for loan and lease losses	51,318	136,941	145,806	184%	
Est. net charge-offs	-	105,669	107,798		
Net charge-offs to avg. loans	0.52%	1.12%	1.14%		
Provision to avg. loans	0.54%	1.45%	1.55%		
Loan loss reserve ratio	1.25%	1.57%	1.95%		Assumes avg. reserve ratio of prior credit cycles for C&I loans, all else consistent with LTM
Est. C&I reserve ratio	-	1.90%	2.33%		
Pre-tax income	277,683	165,928	142,167	-49%	Assumes 1H18 tax rate (wtd.)
Estimated tax rate (wtd. avg. of 1H18)	21%	21%	21%		
Applicable income taxes	59,631	35,632	30,530		
Net operating income	218,052	130,296	111,637		
Estimated impact from higher C&I losses vs. LTM	-	-40.2%	-48.8%		
Tangible book value	1,579,104	1,579,104	1,579,104		Assumes no change to dividends paid Assumes banks halt repurchase activity during "credit cycle"
Add: Net operating income	-	130,296	111,637		
Less: Dividends	-	134,664	134,664		
Less: Share repurchase	-	0	0		
Pro forma tangible book value	1,579,104	1,574,736	1,556,077	-1%	
Estimated impact from higher C&I losses vs. LTM	-	-0.3%	-1.5%		

Source: BofA Merrill Lynch Global Research, FDIC

Scenario #3: "Severely stressed" or deeper recession; fed funds to zero

Under our severely stressed scenario, we project bank C&I asset quality to outperform leveraged loans and nonbank direct lending. In this scenario, the bank earnings hit is also severe (53%), and book value is eroded by 2% on a cumulative basis.

Bank sensitivity to severely stressed scenario: 53% earnings hit

Under the "severely stressed" scenario, we see an earnings hit of 47% on Year 1 and 53% by Year 2 (see Exhibit 10). Book value would decline 1% in Year 1, and 2% by Year 2. We did not shut off or reduce dividends, but we did shut off buybacks. In an actual severe recession, we would anticipate dividend cuts in reality.

In order to stress test losses under a severe recession, we looked at (annualized) DFAST C&I losses under the "severely adverse" scenario, which encompasses five stress tests. We then applied peak reserves to the C&I portfolio. We similarly held losses and reserves constant, though we recognize that is even more unlikely in a severe recession.

To reflect the Fed reducing its target rate to 0%, we estimate a decline in net interest income by 5% in Year 1 and another 3% decline in Year 2. That said, again, in reality, if the Fed is using alternative tools to support the economy and the market (such as asset purchases), the hit to net interest income may be greater as the entirety of the curve moves down.

Exhibit 10: Scenario analysis under severely stressed conditions

Severely stressed scenario	"Base"	Year 1	Year 2	2yr chg	Notes
Net interest income	522,652	496,519	481,624	-8%	Assumes 5% decline in Y1, followed by a 3% decline in Y2, consistent with historical trends
Total noninterest income	262,436	262,436	262,436		
Total noninterest expense	456,087	456,087	456,087		
Pre-provision net revenue (PPNR)	329,001	302,869	287,973	-12%	Assumes Fed projected C&I loan losses under DFAST, all else equal to long-term avg.
Provision for loan and lease losses	51,318	156,562	156,562	205%	
Est. net charge-offs	-	119,651	119,651		
Net charge-offs to avg. loans	0.52%	1.27%	1.27%		
Provision to avg. loans	0.54%	1.66%	1.66%		
Loan loss reserve ratio	1.25%	1.63%	2.00%		Assumes reserve ratio during 2007-09 financial crisis for C&I loans, all else consistent with LTM
Est. C&I reserve ratio	-	2.85%	2.85%		
Pre-tax income	277,683	146,306	131,411	-53%	Assumes 1H18 tax rate (wtd.)
Estimated tax rate (wtd. avg. of 1H18)	21%	21%	21%		
Applicable income taxes	59,631	31,419	28,220		
Net operating income	218,052	114,888	103,191		
Estimated impact from higher C&I losses vs. Base	-	-47.3%	-52.7%		
Tangible book value	1,579,104	1,579,104	1,579,104		Assumes no change to dividends paid Assumes banks halt repurchase activity during "credit cycle"
Add: Net operating income	-	114,888	103,191		
Less: Dividends	-	134,664	134,664		
Less: Share repurchase	-	0	0		
Pro forma tangible book value	1,579,104	1,559,328	1,547,631	-2%	
Estimated impact from higher C&I losses vs. Base	-	-1.3%	-2.0%		

Source: BofA Merrill Lynch Global Research, FDIC

Non-bank sensitivity analysis: it's all about earnings, not rates

Generally speaking, we do not see an unmanageable decline in the ability of borrowers to service their debt, based on the current expected trajectory of rates. In other words, higher interest rates alone should not drive greater defaults. Cash flow issues stemming from a mild or severe earnings contraction would, however, in our view.

In the exhibits below, we look at where the asset classes stand today in terms of valuations and fundamentals. Note that while we show HY and syndicated loan spaces in two separate columns, the reality of the situation is that these spaces are not mutually exclusive as some issuers are present in both markets. With this limitation in mind, we think of this attribution as being defined by issuers that are predominantly HY or predominantly loans. We believe that such representation, while imperfect, allows us to more properly model the capital structure behavior of these otherwise distinct asset classes.

Scenario #1: +100bp move in LIBOR, “average” loss rates

This section is the base-case for the next couple of years, implies the macro environment remains broadly supportive and the Fed achieves its longer-term dot plot forecast. We note the following dynamics in our analysis:

- The impact on issuer fundamentals here is visible in changing coupons to the extent they are floating, and interest coverage ratios (ICRs) change in response to coupons.
- ICRs get somewhat problematic in syndicated loans and private debt space, but they remain generally manageable and comfortably above 2x.
- Leverage here is assumed to be unchanged, even though one could reasonably expect both earnings and debt to grow, somewhat out of sync with each other, over the next few years in a scenario where the Fed is able to deliver four more rate hikes. We did not aim to make this exercise about our judgment on those two imperfectly synchronized growth rates, and decided to leave our leverage assumption unchanged in pursuit of simplicity and clarity of more consequential arguments that follow.
- We think some moderate credit losses could come out of this scenario, but unlikely to mark a turn in credit cycle more broadly. Such incremental moderate credit losses are more likely to surface in the syndicated loan and private debt spaces, where capital structures are predominantly floating rate.
- Importantly, we do not view this scenario as being directly linked to the next substantial pickup in credit losses. This is not how the cycle ends.

Exhibit 11: Non-bank sensitivity under +100bp parallel shift in rates

	HY Bonds	Leveraged, Syndicated Loans	Private Debt
Pct Floating	25%	75%	95%
Fixed Coupon	6.65%	6.08%	7.75%
Floating Coupon (over Libor)	3.90%	3.33%	5.00%
Current	Libor	2.40%	
	Weighted Average Coupon (w/ Libor)	6.56%	7.42%
	Total Debt, US\$bn	\$1,200	\$700
	LTM EBITDA, US\$bn	\$255	\$127
	Int Expense, US\$bn	\$79	\$52
	Leverage Ratio	4.7x	5.5x
	Coverage Ratio	3.2x	2.5x
+100bp Fed funds	Libor	3.40%	
	Weighted Average Coupon (w/ Libor)	6.81%	8.37%
	Total Debt, US\$bn	\$1,200	\$700
	LTM EBITDA, US\$bn	\$255	\$127
	Int Expense, US\$bn	\$82	\$59
	Leverage Ratio	4.7x	5.5x
	Coverage Ratio	3.1x	2.2x

Source: BofA Merrill Lynch Global Research

Scenarios #2 and #3: Comparing a mild vs. a severe recession

The key component of our sensitivity analysis is designed to define a full-scale recessionary experience, both in the event of a mild recession and a severe recession.

- We assume earnings decline 30% (normal recessionary range 30-40%), the Fed cuts rates down to zero and Libor bottoms out at 0.50%, leverage/ICR ratios respond accordingly as functions of unchanged debt levels, lower earnings and somewhat lower interest expenses, to the extent of their floating nature.
- Given these changes in issuer fundamentals, leverage is likely to increase to 6.7x in HY, 8.6x in syndicated loans, and 7.5x in private debt.
- In a severe recession, under these prevailing leverage conditions, we argue the default rates could hit 10% in HY (normal recessionary range 8-12%), meaningfully higher level of 14% in syndicated loans, and 12% in private debt (though limited history).
 - The HY bond market has an established track record of peak default rates over three independent credit cycles, with a normal recessionary peak level of 8-12%. We thus argue for a middle-of-the-road type of default experience here in the next credit cycle.
 - Such track record is materially less reliable in syndicated loans, where the 2001-2002 cycle arrived when the asset class was in its infancy, and the 2008-2009 was arguably softened by the extraordinary policy response aimed specifically at banks and structured finance products, although not directly CLOs.
 - Our argument for a 14% default rate rests on our understanding of substantial growth rates that were witnessed here in recent years, coupled with the higher leverage measures relative to other related asset classes. Leverage in the syndicate loan market could hit 8.6x under a moderate assumption of a 30% drop in EBITDAs.
 - The private debt space has no meaningful track record in previous credit cycles, as the asset class has grown to its present size only in the past few years, although its early origins are traceable to the previous decade. We thus base our 12% default rate assumption primarily on its leverage measures, which are assumed to be (but not always directly observable)

around 5x-5.5x, in between HY and syndicated loans (though some data suggests default rates could be lower).

- We also assume recovery rates of 35% in HY, 60% in loans and private debt. Recovery rates here are defined as trading prices shortly after the event of default. This measure differs from ultimate recovery, which is the payout on the other side of a restructuring process.
 - Syndicated loan recoveries are penalized as a function of three factors: poor investor protections/covenants and poor tangible asset coverage in sectors most exposed to syndicated loans (technology, services, and retail). We do give the loan market a benefit as its structure is now materially less exposed to mark-to-market instruments, thus limiting the extent of fire sales that took place in 2008-2009.
 - A 60% recovery assumption in private debt in a severe recession is a very rough estimate, given the absence of verifiable historical track records and extremely low liquidity. Paradoxically, the latter could be viewed as a benefit, as absence of any practical ability to trade out of a position could arguably prevent many private loans from ever being “marked-to-market” in a restructuring process. We aim to approach this question more holistically however, essentially making an argument that if an independent expert were to make a bona-fide assessment of such loan’s true market value in a distressed situation, he/she must have applied an additional discount for illiquidity.
 - While we heard a wide range of opinions on this particular subject from various experts in this field, we believe that at the end of the day, inability to trade cannot be reasonably argued to increase intrinsic value, even if it does make its determination less transparent.

Exhibit 12: Scenario analysis under stressed and severely stressed conditions

Severely Stressed Case	Libor	0.50%	
	Weighted Average Coupon (w/ Libor)	6.09%	5.61%
	Earnings Growth	-30%	
	Total Debt, US\$bn	\$1,200	\$700
	LTM EBITDA, US\$bn	\$179	\$89
	Int Expense, US\$bn	\$73	\$39
	Leverage Ratio	6.7x	7.9x
	Coverage Ratio	2.4x	2.3x
	Peak Default Rate	10.0%	12.0%
	Cycle Duration, yrs	2.0	
	Recovery Rate (price after default)	35.0%	60.0%
	Credit Loss (Permanent Loss), US\$bn	\$156	\$67
	Secondary Dollar Price	0.65	0.60
	Mark-to-Market Loss (Temporary Loss), US\$bn	\$378	\$246
Stressed Case	Current Income Generation, US\$bn/yr	\$79	\$52
	Permanent Loss, multiple of Current Income	2.0x	1.3x
	Temporary Loss, multiple of Current Income	5x	5x
	Permanent + Temporary Loss, multiple of Income	7x	6x
	Libor	0.50%	
	Weighted Average Coupon (w/ Libor)	6.09%	5.61%
	Earnings Growth	-30%	
	Total Debt, US\$bn	\$1,200	\$700
	LTM EBITDA, US\$bn	\$179	\$89
	Int Expense, US\$bn	\$73	\$39
	Leverage Ratio	6.7x	7.9x
	Coverage Ratio	2.4x	2.3x
	Peak Default Rate	8.0%	9.0%
	Cycle Duration, yrs	2.0	
	Recovery Rate (price after default)	40.0%	75.0%
	Credit Loss (Permanent Loss), US\$bn	\$115	\$32
	Secondary Dollar Price	0.80	0.85
	Mark-to-Market Loss (Temporary Loss), US\$bn	\$221	\$96
	Current Income Generation, US\$bn/yr	\$79	\$52
	Permanent Loss, multiple of Current Income	1.5x	0.6x
	Temporary Loss, multiple of Current Income	3x	2x
	Permanent + Temporary Loss, multiple of Income	4x	2x

Source: BofA Merrill Lynch Global Research

- Permanent credit losses are defined as the peak default rate times expected duration of the cycle (we assume 2 years) times severity (or 1 minus the recovery rate).
 - We also calculate temporary mark-to-market losses based on assumed low print in secondary market prices of 65c in HY, 70c in loans, and 60c in private debt. Naturally the confidence in these assumptions must be taken into consideration with expected depth of liquidity.
 - We separate between permanent and temporary loss here in an effort to highlight the fact that the latter is not crystalized unless an investor sells at that low print, although everyone is taken for a ride to that level. The permanent loss is unavoidable if a portfolio is exposed to an instrument in question.
 - In a severe recession, we estimate permanent losses to be roughly 2x the current annual income generated in HY and syndicated loans and 1.3x in private debt. Temporary losses are estimated at 5x the annual income level.
 - To put it another way, investors stand to wipe out 5 years of their income if a severe recession were to materialize in this exact form, although a material portion of that is likely to be recaptured in a subsequent upswing. They are also likely to never recover 2 years of their current income, assuming a passive benchmark exposure to HY/loans and 1.3 years to private debt.

- Highlighted in gray next to each scenario, we also show less stressed scenarios that could occur in a mild recession, to give readers a better sense of the range of likely outcomes. We think of these more- and less-stressed scenarios as equally likely to materialize over the next few years, dependent on currently unknown circumstances of the next downturn.
- We also give private debt a greater benefit of the doubt that recoveries there could be materially better in a mild recession, a function of lower leverage and better covenant protections in that space.
- The key takeaway here is that temporary losses could be limited to 3 years of income in HY/loans and 2 years in private debt. Permanent losses could claim 1.5yrs, 1yrs, and 0.6x yrs respectively.
- In a more optimistic scenario, we assume somewhat lower credit losses in loans and private debt. Default rates are assumed at 10% in this less-stressed scenario, while recoveries are at 70% in syndicated loans and 75% in private debt (credit given for patient institutional capital, and better structured deals vs. syndicated loans).

Summary of non-bank sensitivity credit analysis

Exhibit 13: Scenario analysis for credit losses in leveraged finance, private debt

	HY Bonds	Leveraged, Syndicated Loans	Private Debt
Pct Floating	25%	75%	95%
Fixed Coupon	6.65%	6.08%	7.75%
Floating Coupon (over Libor)	3.90%	3.33%	5.00%
Current			
Libor		2.40%	
Weighted Average Coupon (w/ Libor)	6.56%	5.82%	7.42%
Total Debt, US\$bn	\$1,200	\$1,100	\$700
LTM EBITDA, US\$bn	\$255	\$183	\$127
Int Expense, US\$bn	\$79	\$64	\$52
Leverage Ratio	4.7x	6.0x	5.5x
Coverage Ratio	3.2x	2.9x	2.5x
+100bp Fed funds			
Libor		3.40%	
Weighted Average Coupon (w/ Libor)	6.81%	6.57%	8.37%
Total Debt, US\$bn	\$1,200	\$1,100	\$700
LTM EBITDA, US\$bn	\$255	\$183	\$127
Int Expense, US\$bn	\$82	\$72	\$59
Leverage Ratio	4.7x	6.0x	5.5x
Coverage Ratio	3.1x	2.5x	2.2x
Severely Stressed Case			
Libor		0.50%	
Weighted Average Coupon (w/ Libor)	6.09%	4.39%	5.61%
Earnings Growth		-30%	
Total Debt, US\$bn	\$1,200	\$1,100	\$700
LTM EBITDA, US\$bn	\$179	\$128	\$89
Int Expense, US\$bn	\$73	\$48	\$39
Leverage Ratio	6.7x	8.6x	7.9x
Coverage Ratio	2.4x	2.7x	2.3x
Peak Default Rate	10.0%	14.0%	12.0%
Cycle Duration, yrs		2.0	
Recovery Rate (price after default)	35.0%	60.0%	60.0%
Credit Loss (Permanent Loss), US\$bn	\$156	\$123	\$67
Secondary Dollar Price	0.65	0.65	0.60
Mark-to-Market Loss (Temporary Loss), US\$bn	\$378	\$331	\$246
Current Income Generation, US\$bn/yr	\$79	\$64	\$52
Permanent Loss, multiple of Current Income	2.0x	1.9x	1.3x
Temporary Loss, multiple of Current Income	5x	5x	5x
Permanent + Temporary Loss, multiple of Income	7x	7x	6x
Stressed Case			
Libor		0.50%	
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Cycle Duration, yrs		2.0	
Recovery Rate (price after default)	40.0%	70.0%	75.0%
Credit Loss (Permanent Loss), US\$bn	\$115	\$66	\$32
Secondary Dollar Price	0.80	0.80	0.85
Mark-to-Market Loss (Temporary Loss), US\$bn	\$221	\$198	\$96
Current Income Generation, US\$bn/yr	\$79	\$64	\$52
Permanent Loss, multiple of Current Income	1.5x	1.0x	0.6x
Temporary Loss, multiple of Current Income	3x	3x	2x
Permanent + Temporary Loss, multiple of Income	4x	4x	2x

Source: BofA Merrill Lynch Global Research

Liquidity risk in a recession could be more pronounced

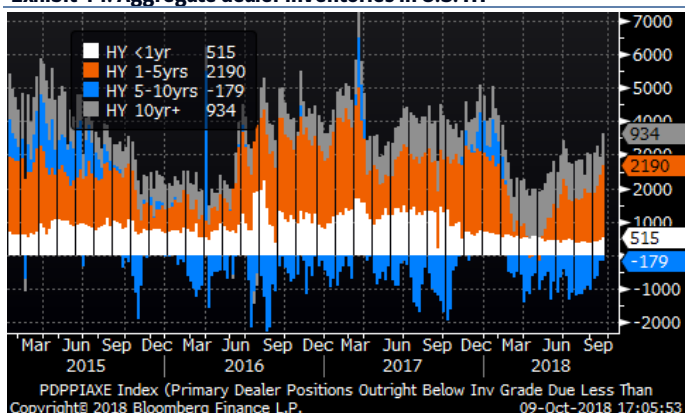
Liquidity has generally been a constraining factor throughout the history of leveraged finance markets. HY bond and leveraged loans have rarely provided investors with particularly deep secondary trading markets – at least, if one's point of reference is determined by experienced in large cap equities, higher-quality bonds, FX, or commodities.

In the past, there were episodes when lev fin liquidity was relatively good, as was the case in 2006-07. Additionally, throughout history, there were select large capital structures that often had deep two-sided markets. Rarely do experienced leveraged finance investors expect deep liquidity to last over considerable time or encompass a considerable number of issuers in this market.

The topic of liquidity in the leveraged finance space has emerged as an issue of particular concern to credit investors, particularly after the Global Financial Crisis. After all, dealers curtailed their market-making activities as a result of both new regulations (capital requirements and the Volcker Rule, the latter which we detail later this section), as well as changes to dealer risk appetite and policies. The days of multi-billion dollar inventories of HY bonds on bank balance sheets came to an end shortly after 2008.

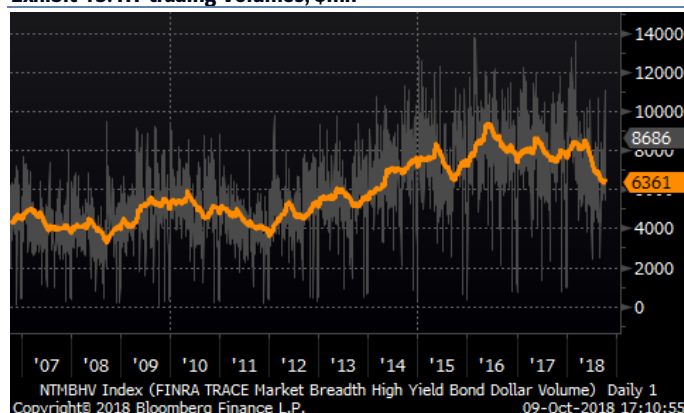
In recent years, aggregate dealer inventories in HY have rarely exceeded \$5bn. This \$5bn stands against a \$1.3tn market by size and against \$6-8bn of average trading volume it generates in a given day (see Exhibit 14 and Exhibit 15).

Exhibit 14: Aggregate dealer inventories in U.S. HY



Source: The Federal Reserve

Exhibit 15: HY trading volumes, \$mn



Source: NASD FINRA

These facts lead to concerns that while the liquidity situation appears sustainable in times of inflows into the asset class, it may be easily disrupted in times of market stress and significant investor withdrawals. Additionally, if liquidity can be described as limited in HY bonds, and perhaps even more constrained in broadly syndicated loans, it may be nonexistent in smaller middle-market and private debt spaces, where whole tranches are often held in only a handful of accounts.

We generally share these concerns and agree with the argument that the next credit cycle will present an important test to the stability of the leveraged finance market's trading infrastructure. The key point here is to remember that while the AUM (assets under management) in funds promising investors daily liquidity has grown by hundreds of billions of dollars in recent years, dealer balance sheets went the other way and compressed to a significant extent.

With all these reservations in mind, we do not count ourselves among doomsayers that predict a severe dislocation in corporate credit as a result of liquidity constraints.

As we introduced this topic above, we started with a description of the secondary market that has been perennially illiquid with exceptions due to unusually lax risk management episodes or unusually well traded cap structures. Seasoned investors who have participated in this market over several credit cycles likely understand its liquidity constraints.

The fact that dealers have stepped back has been balanced with the fact of new trading venues, counterparties, and instruments emerging to fill the void. There are several competing electronic trading platforms in the credit space today that did not exist prior to the financial crisis. Hedge funds and other opportunistic investor types are counting themselves among active market makers and they have stepped in during the recent episodes of market volatility with firm bids. Portfolio instruments such as ETFs, total return swaps, and options now complement CDX (credit default swap) indexes in allowing investors to transfer risk more efficiently.

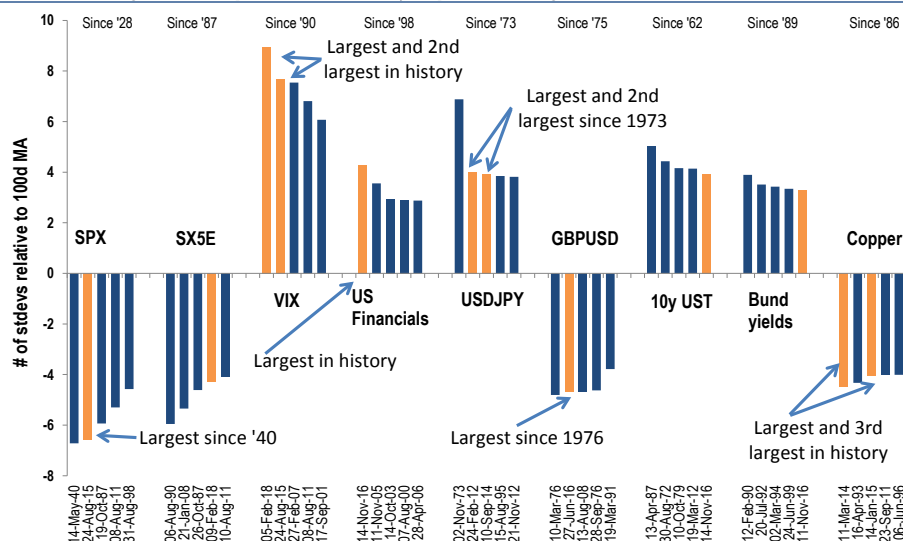
Will the bid-ask spreads widen meaningfully in the next stress episode? We believe they will. Will the market necessarily malfunction in that scenario? Not necessarily.

Recent deep stress volatility events such as Dec 2015 (a small distressed fund failing), Jun 2016 (Brexit), Nov 2016 (Trump election), and Jan 2017 (VIX fund failures) have proven the ability of the leveraged finance markets to continue to operate. In fact, one could argue that all these episodes rewarded those who had the discipline, the risk budget, and the market sense to step in and take advantage of those temporary dislocations.

Considering the Volcker Rule: Progress could be dependent upon midterms

In general, we think prudential regulation on capital and liquidity, along with the Volcker Rule, could exacerbate liquidity trends driven by changes in market structure and market growth in a volatile market. The chart below looks at the standard deviation of performance across a wide variety of asset classes (see Exhibit 16). In each asset class, recent volatility has been in the top five widest standard deviations historically. This suggests more limited capacity by broker/dealers to be supportive in a volatile market. But to emphasize, the leveraged finance markets have held up well even in the midst of recent volatility.

Exhibit 16: Many assets experienced record jumps in recent years from calm to stress



Source: BofA Merrill Lynch Global Research. Daily data of the SPX from 30-Dec-27 to 2-Dec-15, VIX from 2-Jan-90 to 2-Dec-15, SHCOMP from 31-Dec-90 to 2-Dec-15, USDJPY from 31-Mar-71 to 2-Dec-15, EURCHF from 31-Mar-99 to 2-Dec-15, USGG10YR from 30-Mar-62 to 2-Dec-15, GDBR10 from 31-Mar-89 to 2-Dec-15 and XAU from 31-Mar-20 to 2-Dec-15. We measure this one day dislocation as the magnitude of the level relative to its trailing 100d moving average in standard deviations. If we see records set on subsequent days, we only record the largest as representing that event. For USGG10YR, we use the intraday move on 15-Oct-14.

Impactful reform to the Volcker Rule (as suggested by a 2017 OCC proposal) could be at risk if Democrats win one or both chambers of Congress. About 40% of rule changes to Volcker would have to be done through legislation, with the rest achievable through regulation (see Exhibit 17).

Exhibit 17: U.S. Dept. of the Treasury recommendations for Volcker reform

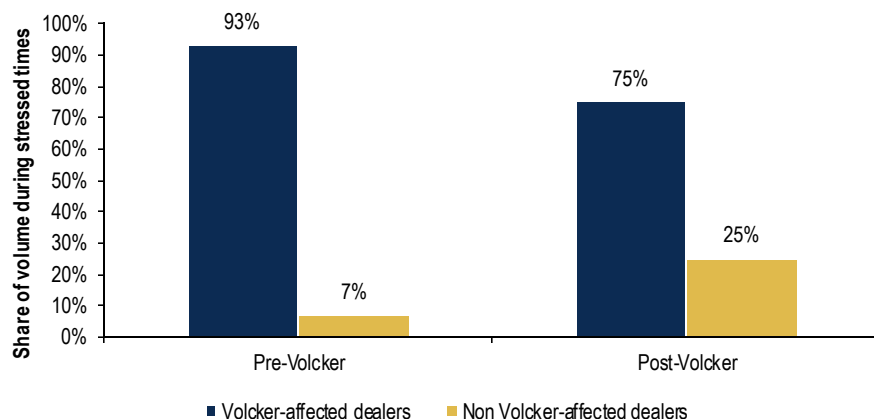
Recommendation	Congress	Regulator
▪ Exempt smaller banking entities from the Volcker Rule	✓	
▪ Improve coordination among regulatory agencies		✓
▪ Eliminate the 60-day rebuttable presumption from definition		✓
▪ Assess whether to eliminate the purpose test from definition	✓	
▪ Provide additional flexibility to adjust determinations of the reasonable amount of market making inventory		✓
▪ Evaluate the benefits of other modifications to RENTD	✓	
▪ Reduce the burden of hedging business risks		✓
▪ Eliminate the documentation requirement of hedged assets		✓
▪ Reduce the burden of the Volcker Rule's compliance regime		✓
▪ Adoption of a simple definition of covered funds		✓
▪ The exemption in Section 23A of the Federal Reserve Act should be restored in the Volcker Rule	✓	✓
▪ The "seeding period" exemption from the covered funds investment restriction should be extended to 3-years	✓	
▪ An exemption of "banking entity" should be provided for foreign funds owned or controlled by a foreign affiliate	✓	✓
▪ Create an "off-ramp" for highly capitalized banks	✓	

Source: U.S. Dept. of the Treasury

A Fed study released in December 2016 examined the corporate bond market in times of stress (defined as when a corporate bond rating was downgraded), and tried to isolate Volcker impact from other prudential regulations by looking at data from Volcker-

impacted dealers vs non-Volcker impacted dealers. Prior to Volcker, impacted dealers were 93% of the stressed volumes during the observable period; this shrank to 75% after the rule was implemented (see Chart 46).

Chart 46: Share of volume decline during times of stress among “Volcker-affected” banks (a/o 2015)



Source: BofA Merrill Lynch Global Research, Federal Reserve

Cycle has room to run, but gauging risks

While corporate leverage is elevated, we believe this economic cycle has longer to run – potentially giving corporates the opportunity to de-lever, as we’ve observed in the past two years. Further, as we supported in our stress testing, higher interest rates alone will not be the primary driver of defaults – rather, we would need to see the corporate cash flow issues that would typically accompany a recession.

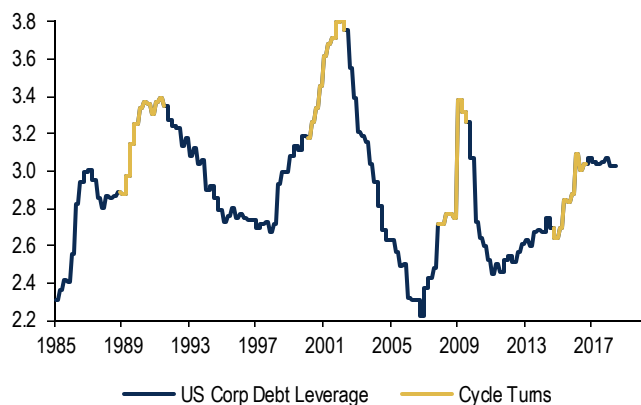
In the event of an economic downturn, all else equal, defaults on bank balance sheets and off-balance sheet legal or contractual liabilities to the banks should pose greater systemic risk to the system. However, given the post-crisis regulatory environment, the probability of default is likely higher at a nonbank, and the risks are still large given the linkages of nonbanks to broader financial stability. In other words, while a market dependent on bank lending contains more systemic risks, we believe it is less likely to experience as big of a crisis as the non-bank market where the pain could be more severe.

U.S. corporate debt load elevated, but interest coverage is strong

Leverage is elevated across US credit markets, and if the next credit cycle were to occur in the near future, we think this factor would increase the likelihood of seeing higher defaults and lower recoveries.

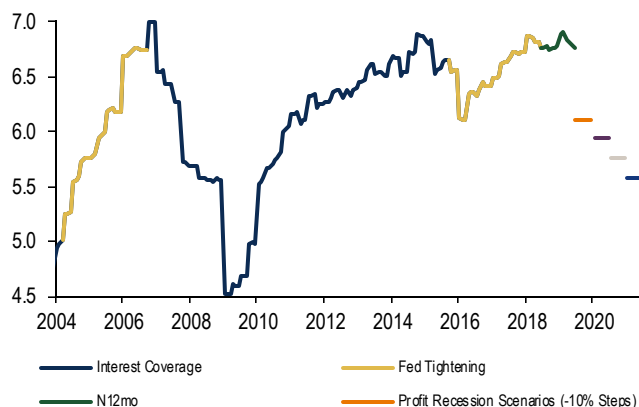
While elevated leverage is an objective reality, we think the causes and consequences of it are often misunderstood. We do not view this data point as an indicator of the credit cycle turning here, but rather a consequence of two developments: (1) unusually slow recovery from the Global Financial Crisis (also visible in labor markets and inflation); and (2) a near-cyclical experience during the commodity downturn of 2015-2016.

Chart 47: U.S. non-financial corp debt leverage



Source: Federal Reserve

Chart 48: U.S. non-financial corp int coverage



Source: Federal Reserve

We think this credit cycle has longer to run, and given the earnings growth currently observable (around +20% YoY) or expected (+18% next 12mo based on our model), we expect corporates to use this opportunity to continue deleveraging, just like they have over the past two years (peak leverage was reached in early 2016).

We also note that interest coverage ratios (ICR or debt service ratio) remain strong, even after the seven hikes in Fed funds and an ongoing Fed balance sheet reduction. This is supported by our stress test analysis. We think the Fed is unlikely to be the cause of the credit cycle turning as our scenario analysis suggests that even with six more hikes from here (matching the 2020 dot of 3.375), it will only have a moderate impact on the ICR. An earnings recession remains a key risk to the health of this metric.

We note that Fed policy works with a lag, and that coupons take several years to re-price. Our earlier analysis has shown that the peak correlation between Fed Funds and HY coupons takes place with a 36mo lag (i.e. policy today determines coupons in down the road).

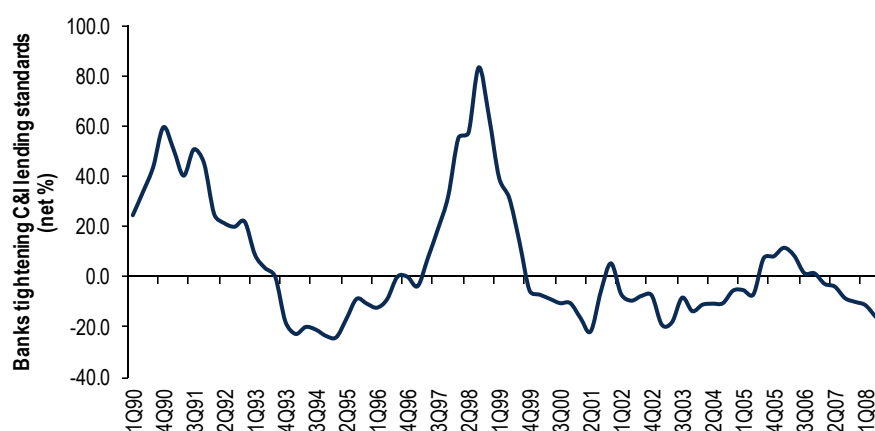
Assessing potential risks to the US economy

Credit and the economy

As discussed in detail in this report, businesses are no longer as dependent on banks or capital markets for loans given the increased presence of “non-banks” which have become more engaged in the market. Intuitively, greater credit creation – regardless of the source – should go hand-in-hand with stronger business investment. We typically think about credit creation as the oil for the economic engine or more formally as generating a “financial accelerator” effect on the economy. This means, all else equal, greater credit creation leads to stronger economic growth. However, we need to consider the risks associated with broader access to credit.

Most macro models focus on measures of bank lending as the primary source of credit creation. A simple regression of business investment as a function of C&I loan growth shows that credit creation enters as a significant positive. We also find that bank lending standards from the Senior Loan Officer Survey (SLOOS), which is measured as net tightening, is a good leading indicator of credit growth and enters as a significant negative in a regression (tighter standards show up as a negative for investment, see Chart 49).

Chart 49: FRB Senior Loan Officer Survey (SLOOS)



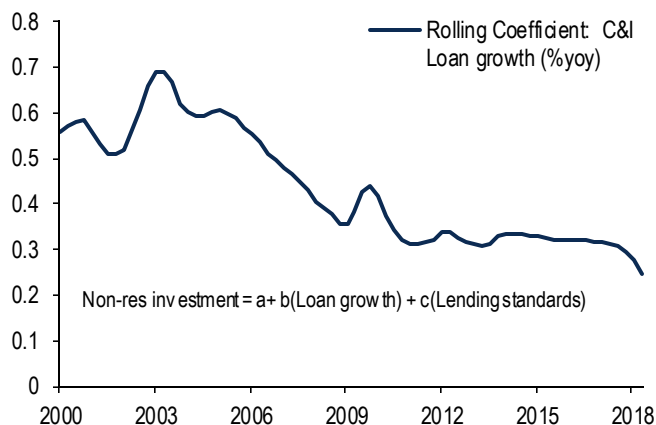
Source: Federal Reserve

If the focus is shifting away from banks and toward alternatives, we would see the relationship between investment and bank lending weaken over time. We test this by running a rolling regression over a 10-year moving time frame of business investment as a function of loan growth and lending standards. The coefficient on loan growth has indeed declined, particularly in the aftermath of the Great Recession, and has held at lower levels (see Chart 50). This shows that bank lending has become less important in influencing business investment. In contrast, lending standards have become a more important determinant of investment (see Chart 51). This shows a greater sensitivity to credit standards, which is likely a function of tighter regulatory standards. The model is supportive of the argument that businesses have become less reliant on bank lending.

The diminished influence of bank lending on investment may not only be a function of tighter lending standards but also an increase in availability of alternative sources of financing. One obvious place to turn to is the capital markets. We look at the relationship of credit spreads and demand for C&I loans on actual investment. We find a significant relationship where a decline in credit spreads leads to greater business investment. Adding the SLOOS demand for C&I loans into the model comes in significant as well, suggesting that funding from both capital markets and banks can be important at the same time.

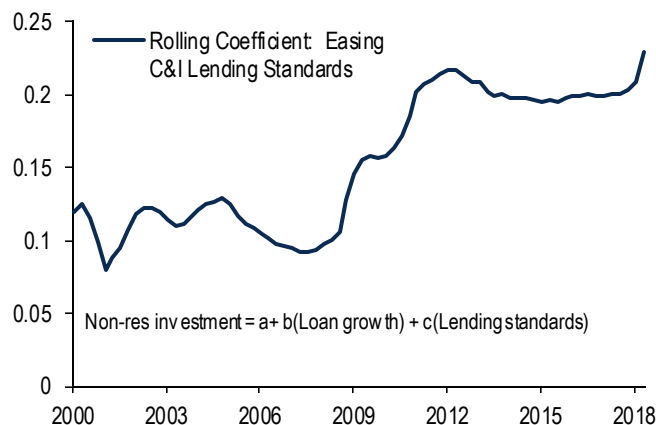
The conclusions seem straightforward – access to credit helps to generate greater business investment. When credit spreads tighten, we tend to see greater reliance on capital markets for borrowing, which drives investment. Although it is harder to test given limited data, presumably the same would be true in regards to access to other non-bank lending. When there is increased availability of credit, we tend to see greater investment which feeds back into the broader economy.

Chart 50: Loan growth has become a less important determinant for investment growth



Source: BofA Merrill Lynch Global Research

Chart 51: Easing lending standards have become a more important determinant for investment growth



Source: BofA Merrill Lynch Global Research

Gauging the risk factors

The growth in the nonbank sector has increased the complexity of the financial system, allowing for greater intermediation of credit than would exist with only banks. This has helped to increase access to credit and has allowed for a greater distribution of risk. As such, we can argue that the increase in nonbank lending – particularly from direct lenders – could contribute to greater risk taking. If faced with an economic shock or a big move up in rates, we could see greater defaults, as argued earlier.

The question is over the degree of spillover to the broader market and economy from losses in the nonbank sector versus banks. This largely depends on the composition of the nonbanks. If we are referring to independent lenders who have not distributed the risk more broadly through the financial system, the pain might be contained. However, often nonbanks are directly tied to banks and to market functioning, taking the form of asset managers, for example. The risk therefore may be distributed more broadly through the market.

Moreover, such “shadow banking” is highly pro-cyclical, which means the loss of credit during a recession would be more severe than under a market which was dependent on bank loans.

The Financial Stability Oversight Committee (FSOC) gives us some guidance and has generally found that the nonbank sector has reduced its vulnerabilities to the shocks of the last recession. However, the search for yield may have led to new dynamics that could be destabilizing. There are new elements of the nonbank market which may not be regulated as closely as perhaps is warranted. For example, FSOC has expressed caution about the growth in the asset-management industry, focusing particularly on “potential threats and vulnerabilities in the areas of liquidity and redemption risk and the use of leverage.” Moreover, there is concern about the limited information regarding the risks of the hedge fund community and private equity lending.

All else equal, we believe defaults in loans on bank balance sheets pose a greater systemic risk than in nonbanks.

When banks suffer, we risk a broad reduction in the access to capital and concerns over bank runs; whereas when nonbanks face defaults, losses should be more contained. That said, given the post-crisis regulatory environment, we think the probability of defaults is likely higher at nonbanks, and the risks are still large given the linkages of nonbanks to broader financial stability. In other words, while a market dependent on bank lending has more systemic risks, all else equal, it is also more heavily regulated and less likely to experience as big of a crisis as the nonbank market where we think the pain could be more severe.

Price objective basis & risk

Ares Management (ARES; B-1-7; \$20.93)

Our price objective (PO) for Ares is \$26, which implies a target price-to-ENI (P/ENI or P/E) multiple of 13x our 2019 ENI estimate. Our price objective is the result of our sum-of-the-parts (SOTP) analysis. Our SOTP analysis is based on the following components: a target multiple on fee-related earnings (21x, a premium to asset manager multiples), book value for the balance sheet investments and accrued carry, and a discounted value on the performance fee upside over a cycle (1.4x MOIC). Based on this method, we value the fee-related earnings at \$20/share, the balance sheet (principal investments and accrued carry) at \$2/share, and the discounted value of future carry income and investment income at \$4/share, which equates to a total value of \$26, in line with our price objective.

Risks to our PO: a weak macro and capital markets backdrop, regulatory and political risk, poor performance, weak fundraising, credit market cycle downturn, expansion risk, key person and talent risk, and secondary sales that could weigh on the stock.

SVB Financial Group (SIVB; B-1-9; \$301.14)

Our \$400 PO is based on a three-factor M&A valuation methodology that assumes: a 18.5x P/ 2019e EPS (previously 19.5x) and a target P/TBV of 3.2x to 2018E tangible book, in line with other high growth peers. The third factor reflected an estimated takeout value based on our proprietary M&A scorecard. A bank that scores above average will receive a higher target multiple in line with historical deal valuations.

Downside risks are a longer than expected low rate environment and a slowdown in the technology sector and related IPO activity. Upside risks are sooner than expected rate hike, or better than expected pickup in the tech sector.

The PNC Financial Services Group, Inc. (PNC; B-1-7; \$136.20)

We use a three-factor valuation framework (P/E, P/TBV, DCF) to arrive at our \$168 PO and assign a 2.2x multiple to 2018E TBV and 15x multiple on 2019E EPS, in line with target multiples for the median large regional banks under coverage. We have weighted the P/E and P/TBV factors equally at 40%, and our DCF analysis by 20%.

A superior profitability profile suggests an above peer multiple - however, a challenging macro backdrop and specific industry headwinds restrain our P/E target. Our DCF assumes a two-stage cost of capital of 9.6% and 11.2% and a terminal growth rate of 4%.

Downside risks to our PO are macro risks such as a lower for longer rate environment, the implementation of a strict liquidity coverage ratio and further regulation on overdraft income that restricts bank profitability.

Analyst Certification

We, Erika Najarian, Ebrahim H. Poonawala and Michael Carrier, CFA, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

US - Brokers, Asset Managers, & Exchanges Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Affiliated Mgrs.	AMG	AMG US	Michael Carrier, CFA
	AllianceBernstein	AB	AB US	Michael Carrier, CFA
	Apollo Global Management	APO	APO US	Michael Carrier, CFA
	Ares Management	ARES	ARES US	Michael Carrier, CFA
	BlackRock, Inc.	BLK	BLK US	Michael Carrier, CFA
	BrightSphere Investment Group	BSIG	BSIG US	Michael Carrier, CFA
	Cboe Global Markets	CBOE	CBOE US	Michael Carrier, CFA
	Charles Schwab Corp.	SCHW	SCHW US	Michael Carrier, CFA
	E*TRADE Financial	ETFC	ETFC US	Michael Carrier, CFA
	Eaton Vance	EV	EV US	Michael Carrier, CFA
	Evercore Inc	EVR	EVR US	Michael Needham, CFA
	Goldman Sachs	GS	GS US	Michael Carrier, CFA
	IntercontinentalExchange	ICE	ICE US	Michael Carrier, CFA
	Lazard	LAZ	LAZ US	Michael Needham, CFA
	Moelis	MC	MC US	Michael Needham, CFA
	Morgan Stanley	MS	MS US	Michael Carrier, CFA
	Northern Trust Corporation	NTRS	NTRS US	Michael Carrier, CFA
	T. Rowe Price	TROW	TROW US	Michael Carrier, CFA
	TD Ameritrade	AMTD	AMTD US	Michael Carrier, CFA
	The Blackstone Group	BX	BX US	Michael Carrier, CFA
	The Carlyle Group	CG	CG US	Michael Carrier, CFA
	Victory Capital	VCTR	VCTR US	Michael Carrier, CFA
NEUTRAL				
	Bank of New York Mellon	BK	BK US	Michael Carrier, CFA
	Focus Financial Partners	FOCS	FOCS US	Michael Carrier, CFA
	Franklin Resources	BEN	BEN US	Michael Carrier, CFA
	Houlihan Lokey	HLI	HLI US	Michael Needham, CFA
	Invesco	IVZ	IVZ US	Michael Carrier, CFA
	KKR & Co.	KKR	KKR US	Michael Carrier, CFA
	Nasdaq Inc	NDAQ	NDAQ US	Michael Carrier, CFA
	Oaktree Capital Group	OAK	OAK US	Michael Carrier, CFA
	Och-Ziff	OZM	OZM US	Michael Carrier, CFA
	PJT Partners	PJT	PJT US	Michael Needham, CFA
	State Street Corporation	STT	STT US	Michael Carrier, CFA
	Virtus Investment Partners	VRTS	VRTS US	Michael Carrier, CFA
UNDERPERFORM				
	Artisan Partners	APAM	APAM US	Michael Carrier, CFA
	Cohen & Steers	CNS	CNS US	Michael Carrier, CFA
	Federated Inv.	FII	FII US	Michael Carrier, CFA
	Greenhill & Co.	GHL	GHL US	Michael Needham, CFA
	Janus Henderson	JHG	JHG US	Michael Carrier, CFA
	Legg Mason	LM	LM US	Michael Carrier, CFA
	Waddell & Reed	WDR	WDR US	Michael Carrier, CFA
	WisdomTree	WETF	WETF US	Michael Carrier, CFA
RSTR				
	CME Group	CME	CME US	Michael Carrier, CFA

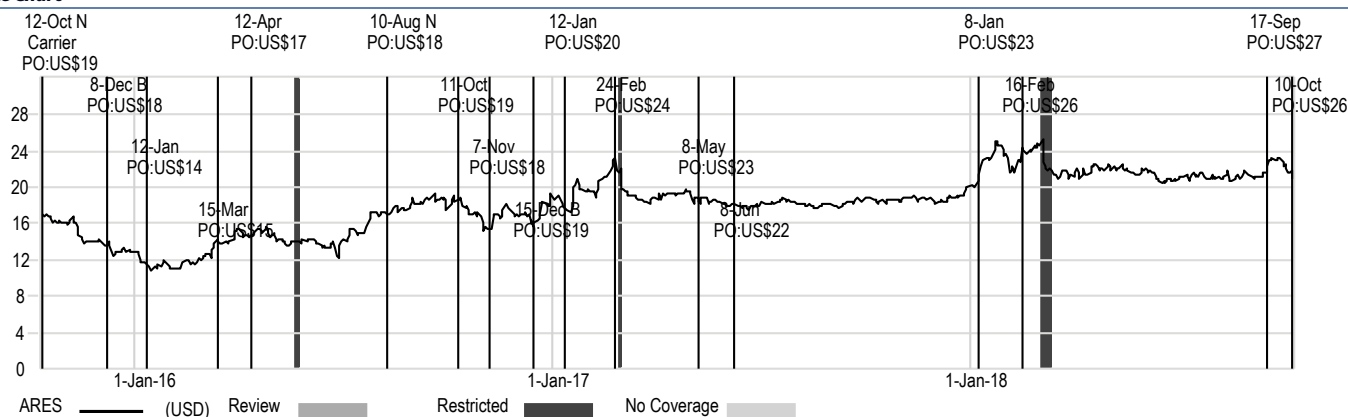
North America - Banks Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	BankUnited, Inc.	BKU	BKU US	Ebrahim H. Poonawala
	BB&T Corporation	BBT	BBT US	Erika Najarian
	Byline Bancorp, Inc	BY	BY US	Ebrahim H. Poonawala
	Citigroup Inc.	C	C US	Erika Najarian
	Comerica Incorporated	CMA	CMA US	Erika Najarian
	Cullen/Frost Bankers Inc	CFR	CFR US	Ebrahim H. Poonawala
	East West Bancorp, Incorporated	EWBC	EWBC US	Ebrahim H. Poonawala
	First Bancorp Puerto Rico	FBP	FBP US	Ebrahim H. Poonawala
	First Hawaiian Inc.	FHB	FHB US	Ebrahim H. Poonawala
	First Republic Bank	FRC	FRC US	Erika Najarian
	Great Western Bancorp Inc	GWB	GWB US	Ebrahim H. Poonawala
	Hancock Whitney	HWC	HWC US	Ebrahim H. Poonawala
	Huntington Bancshares Inc.	HBAN	HBAN US	Erika Najarian
	IBERIABANK Corp	IBKC	IBKC US	Ebrahim H. Poonawala
	JPMorgan Chase & Co.	JPM	JPM US	Erika Najarian
	Key Corp	KEY	KEY US	Erika Najarian
	New York Community Bancorp	NYCB	NYCB US	Ebrahim H. Poonawala
	Regions Financial	RF	RF US	Erika Najarian
	Royal Bank of Canada	RY	RY US	Ebrahim H. Poonawala
	Royal Bank of Canada	YRY	YRY CN	Ebrahim H. Poonawala
	Signature Bank	SBNY	SBNY US	Ebrahim H. Poonawala
	SunTrust Banks, Inc.	STI	STI US	Erika Najarian
	SVB Financial Group	SVB	SVB US	Ebrahim H. Poonawala
	Synovus Financial Corp.	SNV	SNV US	Ebrahim H. Poonawala
	TCF Financial Corp.	TCF	TCF US	Ebrahim H. Poonawala
	Texas Capital Bancshares Inc.	TCBI	TCBI US	Ebrahim H. Poonawala
	The PNC Financial Services Group, Inc.	PNC	PNC US	Erika Najarian
	Toronto-Dominion Bank	TD	TD US	Ebrahim H. Poonawala
	Toronto-Dominion Bank	YTD	YTD CN	Ebrahim H. Poonawala
	UMB Financial Corporation	UMBF	UMBF US	Ebrahim H. Poonawala
	Wells Fargo & Company	WFC	WFC US	Erika Najarian
	Zions Bancorp	ZION	ZION US	Erika Najarian
NEUTRAL				
	Associated Banc-Corp	ASB	ASB US	Ebrahim H. Poonawala
	Bank of Montreal	BMO	BMO US	Ebrahim H. Poonawala
	Bank of Montreal	YBMO	BMO CN	Ebrahim H. Poonawala
	Bank of Nova Scotia	YBNS	BNS CN	Ebrahim H. Poonawala
	Bank of Nova Scotia	BNS	BNS US	Ebrahim H. Poonawala
	Fifth Third Bank	FITB	FITB US	Erika Najarian
	First Horizon National Corp.	FHN	FHN US	Ebrahim H. Poonawala
UNDERPERFORM				
	Bank of California	BANC	BANC US	Ebrahim H. Poonawala
	Bank of Hawaii Corp.	BOH	BOH US	Ebrahim H. Poonawala
	Canadian Imperial Bank of Commerce	CM	CM US	Ebrahim H. Poonawala
	Canadian Imperial Bank of Commerce	YCM	CM CN	Ebrahim H. Poonawala
	Citizens Financial Group	CFG	CFG US	Erika Najarian
	Commerce Bancshares Inc.	CBSH	CBSH US	Ebrahim H. Poonawala
	M&T Bank	MTB	MTB US	Erika Najarian
	Prosperity Bancshares Inc	PB	PB US	Ebrahim H. Poonawala
	U.S. Bancorp	USB	USB US	Erika Najarian
RSTR				
	FCB Financial Holdings, Inc	FCB	FCB US	Ebrahim H. Poonawala

Disclosures

Important Disclosures

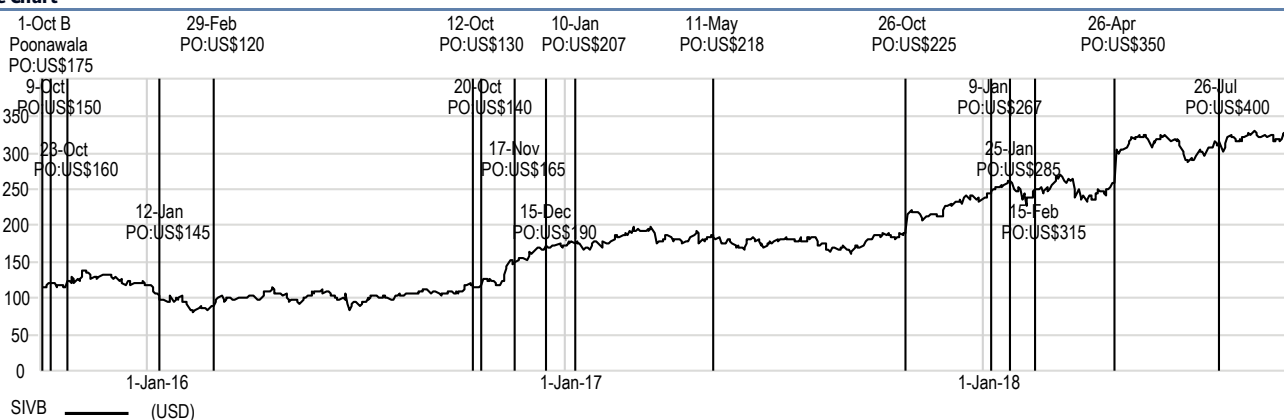
ARES Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of September 30, 2018 or such later date as indicated.

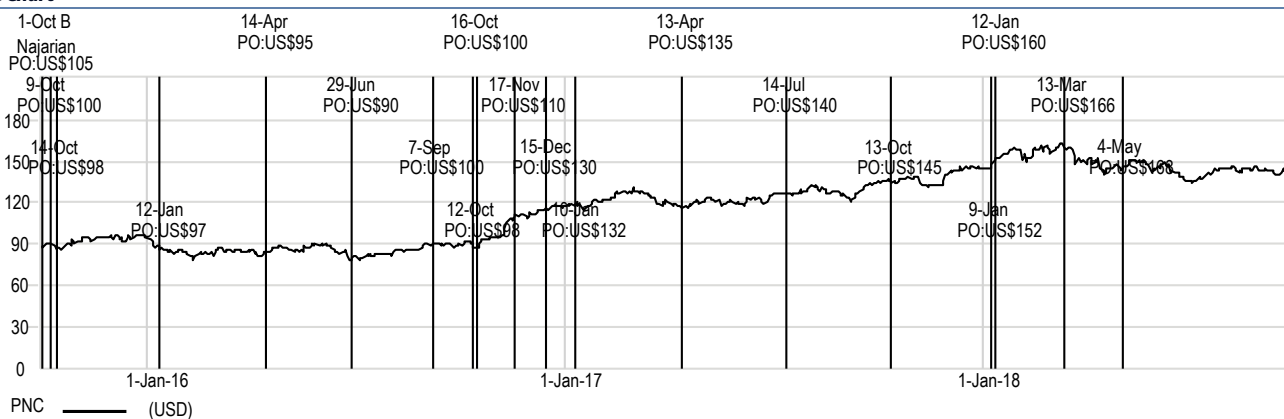
SIVB Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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PNC Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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Equity Investment Rating Distribution: Banks Group (as of 30 Sep 2018)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	93	52.25%	Buy	80	86.02%
Hold	39	21.91%	Hold	32	82.05%
Sell	46	25.84%	Sell	39	84.78%

Equity Investment Rating Distribution: Financial Services Group (as of 30 Sep 2018)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	128	52.03%	Buy	93	72.66%
Hold	62	25.20%	Hold	47	75.81%
Sell	56	22.76%	Sell	26	46.43%

Equity Investment Rating Distribution: Global Group (as of 30 Sep 2018)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1626	55.10%	Buy	1043	64.15%
Hold	641	21.72%	Hold	402	62.71%
Sell	684	23.18%	Sell	327	47.81%

* Issuers that were investment banking clients of BofA Merrill Lynch or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

* Ratings dispersions may vary from time to time where BofA Merrill Lynch Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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