

Credit as a Separate Asset Class

November 2017

Investors are just beginning to identify credit as a separate asset class, driven both by expanded and potentially attractive credit opportunities post Financial Crisis and as an alternative to low current yields found in traditional fixed income.

*We present historical data showing that credit has favorable and sustainable return and risk characteristics that are differentiated from other asset classes, suggesting a separation from traditional fixed income in asset allocation studies. We use traditional mean-variance analysis to show that **optimal allocations to credit range from 10% to 20%** for most institutional investors, and that roughly two-thirds of the funding for a credit allocation should come from fixed income and the remainder from equity.*

*Investors enjoy an increasing range of credit opportunities, particularly private offerings, when constructing a credit portfolio. We catalogue many of these private credit opportunities and review our earlier research findings pointing to a **3-4% higher return for private credit when compared to public credit**. We suggest that credit allocations be mostly comprised of private offerings for investors that otherwise have sufficient portfolio liquidity.*

Introduction

For much of the past 40 years investor exposure to credit has been mostly indirect through allocations to fixed income strategies replicating or tracking broadly diversified benchmarks such as the Bloomberg Barclays Aggregate Bond Index.¹ Today, credit related securities, primarily corporate bonds, represent 28% of the market value of the Index and 26% of total Index risk.² As a result, credit exposure within core portfolios will likely be limited to less than 5% of total assets, restricted to investment grade, and determined by rules governing index constitution rather than investor preference.³

The emergence of traded high yield bonds in the 1980s and syndicated bank loans in the 1990s has allowed investors to diversify directly into securities whose returns are driven primarily by credit risk, rather than a combination of credit risk and interest rate risk. Allocations to these securities are growing, but remain small.⁴

The Financial Crisis has had a lasting and profound impact on the financial sector and, as a result, has expanded opportunities for credit investors, particularly within private credit. The most important post-crisis change for private credit has been increased bank regulation, which created a range of new or expanded opportunities for non-bank lenders. One example is the rise of U.S. direct middle market lending, about which we have written extensively. Other examples of

¹ The predecessor Lehman Aggregate Bond Index commenced in 1976.

² We define credit related securities as non-government, non-agency debt securities, which would exclude government guaranteed mortgage-backed securities. As of September 30, 2017, corporate bonds represented \$5.1 trillion of the \$19.9 trillion of assets in the Bloomberg Barclays Aggregate Bond Index with non-agency securitized products (i.e., CMBS and consumer ABS) representing an additional \$0.5 trillion. Risk allocations are determined by regressing monthly Index returns (dependent variable) with duration-equivalent Treasury bond returns and investment grade (IG) credit excess returns (independent variables). Coefficients represent risk weights. IG credit excess returns are described in Exhibit 1.

³ The 5% credit exposure assumes a 20% allocation to fixed income.

⁴ State pensions allocated 1% of total assets directly to high yield bonds in 2016. Including only states having discrete high yield allocations, the average allocation equaled 5% of total assets. (Source: Cliffwater)

expanded avenues of non-bank financing include marketplace lending, insurance-linked notes, asset-backed lending, and intellectual property (IP) royalties.

This report (1) uses traditional portfolio theory to provide a rationale for credit as a separate asset class, (2) uses mean-variance technology to identify optimal portfolio allocations to credit, (3) catalogues credit alternatives, both public and private, that might be included in credit only allocations, and (4) presents a framework for structuring a credit allocation.

What is an Asset Class?

An asset class is defined as a group of securities that share similar characteristics, or common risk factors. Further, academics and practitioners limit asset class status to securities that by their nature produce a significant and persistent return above cash precisely because their associated risks can't be diversified away.⁵ Equities, fixed income and cash⁶ have traditionally been identified as the three major asset classes. On the other hand, by this definition securities like physical commodities, currencies, and hedge funds would not achieve asset class status.

Credit meets the traditional asset class definition because its primary risk – borrower default – can't be diversified away, and consequently the market provides investors significant returns above riskless cash as a reward. Exhibit 1 provides historical returns and risks for investing in equity, U.S. Treasuries (i.e., interest rate risk) and three categories of liquid corporate credit.⁷

Exhibit 1: Return and Risk for Interest Rates, Equity, and Credit Asset Classes
December 31, 1999 to September 30, 2017

Description	Interest Rates	Equity	Credit		
			Investment Grade (IG) Corporates	Bank Loans (BL)	High Yield (HY) Bonds
Measurement	10 yr. Treasury	Russell 3000 Index	Bloomberg Barclays Investment Grade Corporate Bond Index	S&P/LSTA Leveraged Loan Index	Bloomberg Barclays High Yield Bond Index
Total Return	5.24%	5.56%	6.12%	4.91%	7.37%
minus duration adj [†]	0.00%	0.00%	-3.21%	0.00%	-2.65%
minus 30-day T-bills	-1.75%	-1.75%	-1.75%	-1.75%	-1.75%
Excess Return	3.49%	3.81%	1.16%	3.16%	2.97%
Excess Risk	7.32%	15.07%	5.11%	6.35%	11.14%
Excess Return/Risk	0.48	0.25	0.23	0.50	0.27
Correlations:					
Term Structure	1.00	-0.33	-0.42	-0.35	-0.49
Equity		1.00	0.61	0.50	0.70
Credit (IG)			1.00	0.76	0.86
Credit (BL)				1.00	0.80
Credit (HY)					1.00

All return and risk data is annualized. Risk is calculated as annualized standard deviation of excess return.

[†] Historical return attributable to Bloomberg Barclays Investment Grade and High Yield Bond Index durations. It is calculated by monthly adjustments of the Treasury bond excess returns to equal the same duration as the Investment Grade and High Yield Bond Index durations, respectively.

⁵ Non-diversifiable risks are also known as systematic or beta risks.

⁶ Cash is included as an asset class, representing the risk-free rate of return.

⁷ The January 1, 2000 start date was selected because it is the first date bank loan data is available.

The first two columns in Exhibit 1 provide historical return and risk data for interest rate and equity risk. The last three columns show the same data for three different categories of liquid credit investments, with increasing levels of credit risk: investment grade bonds, broadly syndicated bank loans, and high yield bonds. Investment grade bonds represent the lowest credit risk level. Bank loans are senior secured debt but considered non-investment grade in quality because interest coverage and debt ratios compare less favorably to investment grade debt. Finally, high yield bonds represent primarily subordinated, higher risk debt.

Excess return is shown in the first highlighted row and measures the portion of total return that is solely attributable to the type of beta risk identified by the column. Excess return is also commonly referred to as “risk premium” and is generally calculated by subtracting the risk-free rate (30-day T-bill return) from total return. However, in the case of investment grade and high yield bonds there is an interest rate risk factor as well as a credit risk factor imbedded in total returns. We strip out the interest rate risk factor by subtracting Treasury bond returns – in excess of T-bill returns – whose durations equal those of investment grade and high yield bonds. This duration adjustment results in lowering returns by -3.21% and -2.65% for investment grade and high yield bonds, respectively. No duration adjustment is needed for bank loans because interest income is based on a floating rate that typically adjusts every 30 or 90 days, and not a fixed rate.

Excess returns for all three credit measures are positive but below excess returns for the interest rate and equity asset classes. More relevant are risk-adjusted excess returns, measured by excess return divided by excess risk. Bank loans and interest rates had the highest excess return/risk ratios, equal to 0.50 and 0.48, respectively, while equity, investment grade credit, and high yield bonds produced lower ratios of 0.25, 0.23, and 0.27, respectively.

Exhibit 1 also reports correlations of excess returns between interest rates, equity, and the three credit categories. Not surprisingly, the three credit measures have high cross correlations, ranging from 0.76 to 0.86. Also, the three credit measures not only have negative correlations with interest rates, but of a higher magnitude than equities. Finally, as expected, the correlations between the credit categories and equity is significantly positive, ranging between 0.50 and 0.70, but low enough to achieve meaningful diversification benefits.

Our experience with similar studies tells us that measures of return and risk will vary depending upon the time-period studied. Nonetheless, **our key finding is that credit risk provides investors a significant positive excess return over time that has a low correlation to interest rate and equity excess returns, and therefore should be treated as a separate asset class for asset allocation purposes.**⁸

Credit and Asset Allocation

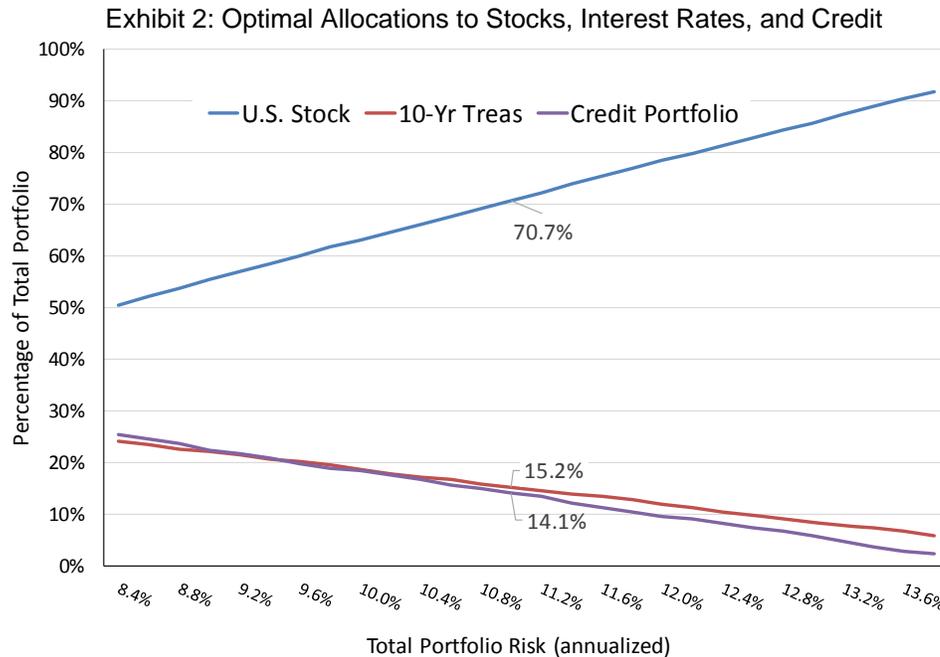
Traditional mean-variance tools are used to plot optimized allocations for equity, interest rates, and credit in Exhibit 2.

Risk and correlation inputs come from the historical data provided in Exhibit 1. A single “credit portfolio” is created by equal weighting the investment grade, bank loan, and high yield bond sub-classes. Return inputs, however, are not the historical returns provided in Exhibit 1 but instead rely upon Cliffwater expectations of future excess returns. This departure is due to the unusually high historical excess return to 10-year Treasuries, attributable to the significant decline in interest rates over the measurement period which, at current levels, is very unlikely to be repeated. Excess return optimization inputs are 4.75% for stocks, 0.50% for interest rates, and 2.56% for the equal-weighted credit portfolio. Total expected returns are 6.60%, 2.35%, and 4.41% for stocks, interest rates, and credit, respectively, when our 1.85% expected return for T-bills is added to expected excess returns.

⁸ See “The Credit Risk Premium”, Attakrit Asvanunt and Scott Richardson, *The Journal of Fixed Income*, Winter 2017, for a similar study looking at investment grade bonds, government bonds, and equities covering the period 1936 to 2014.

Note that expected excess returns are lower for interest rates, higher for equity, and about the same for credit compared to 2000-2017 historical values. Our expected excess returns reflect much more modest return expectations for interest rate returns, given their current historically low level, and somewhat higher excess returns for equity that are more consistent with longer term historical data.

Exhibit 2 reports optimized allocations to stocks, Treasuries, and credit over a range of risk levels from 8.4% to 13.8%.⁹ Exhibit 2 identifies allocations of 70.7%, 15.2%, and 14.1% for equities, Treasuries, and credit, respectively, as optimal allocations for the average risk level found for state pension plans.



Our analysis shows that the optimal portfolio for the average risk institutional investor (i.e., at the 11.1% risk level) includes separate and distinct allocations of 15.2% to interest rates (via 10-year Treasury bonds) and 14.1% to credit.¹⁰ The optimal portfolio for lower risk institutions (i.e., 8.5% total portfolio risk) allocates roughly 25% to credit, while the most aggressive institutions would have less than 5% allocated to credit. Credit is “squeezed out” for the aggressive institutional investor because stocks provide the highest excess return and interest rates are a better diversifier for a portfolio with a high stock allocation. However, most institutional investors would have optimal allocations to credit ranging between 10% and 20% based upon their historical risk levels and our optimization outcomes.

A related question for investors without credit allocations is the optimal sourcing of funds for a newly created credit allocation. Our optimization sources 60% to 66% of the funding for credit from fixed income and the remainder from equity. At the 11.1% average state pension risk level, 8.8% of the 14.1% optimal credit allocation would come from 10-year Treasuries and 5.3% would come from U.S. stocks.

⁹ The risk range is based upon the standard deviation of fiscal year returns for individual state pension plans covering the 15-year period from June 30, 2001 to June 30, 2016. The lowest state pension risk level was 8.4% and the highest risk level was 13.8%. See “An Examination of State Pension Performance: 2007 to 2016” found at www.Cliffwater.com for a detailed discussion of the state pension database and calculation methodology.

¹⁰ This assumes that state pension investment behavior reflects broader “institutional” market behavior.

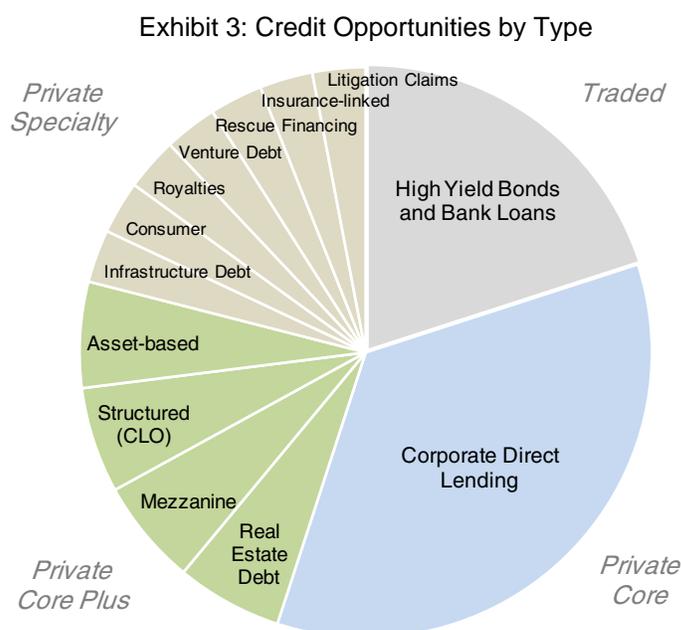
While Exhibit 2 lacks the asset class complexity found in most institutional portfolios, the allocation guidance presented should assist those investors who want to establish a separate credit allocation.

Private Credit Opportunities

The analysis above includes only liquid asset classes. Prior to 2008, institutional credit portfolios consisted primarily of allocations to traded high yield bonds and/or bank loans with perhaps modest and infrequent investments in private credit. After 2008, opportunities in credit have expanded in size and type, as illustrated in Exhibit 3 below.¹¹

Exhibit 3 catalogues multiple types of credit assets, grouped into four subclasses. The first is traded or liquid credit of the type examined in Exhibit 1. The second is corporate direct lending which we define private “core” investments. These are corporate loans to middle market companies without an intermediary bank or broker and are generally considered as the lowest risk among private credit alternatives. The third subclass is private “core plus” and includes four credit asset types sometimes found in larger credit portfolios. This subclass represents potentially higher return investments through greater leverage, sector, or subordination risks.

Finally, a broad range of credit related assets is listed under the subclass umbrella called “specialty” credit opportunities. These may be less well known to investors, often requiring special expertise, and are investable less frequently because market opportunities are smaller. The attractiveness of specialty credit opportunities includes both the possibility of higher returns and a lower correlation to the broader credit markets. Royalties, insurance-linked, and litigation investments are often cited as examples of lower correlation credit opportunities.



The allocations reflected in Exhibit 3 are for illustrative purposes only. The chart is intended to identify the subsectors within the public and private credit opportunity set and not recommended allocations. From a practical perspective it would be difficult to implement high allocations to the core plus and specialty investments, leaving traded and private core together likely representing a

¹¹ The size of each credit segment is illustrative and not intended to reflect recommended allocations.

significant proportion of a composite credit portfolio allocation. Exhibit 4 provides a brief description of each credit opportunity.

Exhibit 4: Credit Opportunity Descriptions

Credit Opportunity	General Description	Characteristics	Net Return Target ¹²
High Yield Bonds	Subordinated, unsecured traded bonds	Higher risk, fixed rate debt	5-6%
Bank Loans	Leveraged loans broadly syndicated by banks	Floating rate + spread	5-6%
Corporate Direct Lending	Directly originated by non-bank entities, typically senior secured loans to middle market companies underwritten to EBITDA	High current income, low losses and volatility	7-10%
Real Estate Debt	Loans collateralized by real estate. Typically takes the form of (i) a whole loan with the senior portion syndicated to a bank partner or (ii) a mezzanine unsecured loan	Hard asset collateral, higher LTVs (60-90% range vs. 50-60% for corporate debt)	7-10%
Mezzanine	Directly originated corporate loans subordinate to senior debt. Can be secured by assets or unsecured, but have priority to equity	Focus on total return, combination of cash and PIK income, plus equity warrants	10-15%
Structured (CLO equity)	Typically, highly levered investments in lower risk credit collateral	High, but risky cash flow	10-12%
Asset-based	Debt backed by assets and underwritten to asset value, rather than cash flow. Collateral may include hard assets and/or financial assets such as trade claims and receivables	Rapid amortization, short duration, typically self-liquidating	6-12%
Infrastructure Debt	Senior and mezzanine debt investments backed by infrastructure assets	High quality hard asset collateral, with long term contractual cash flows	6-9%
Consumer	Loans to consumers either originated on an individual basis or rediscount lending to platforms that originate consumer loans	Short duration, very granular portfolios, typically self-liquidating	6-12%
Royalties	Investments in intellectual property rights with credit-like cash flow characteristics or debt investments to companies collateralized by intellectual property rights	Uncorrelated to credit markets, typically healthcare, entertainment or other IP rights	15%+
Venture Debt	Loans to venture capital-backed companies that are typically not yet profitable. Investments can be a combination of cash and PIK income plus equity/warrants	Private equity-type upside return profile with baseline contractual return from the debt component	15%+
Rescue Financing	Senior debt provided to a company in or approaching bankruptcy	High returns, short duration, super senior debt, typically not a standalone strategy	10-15%
Insurance-linked	Sale of reinsurance policies tied primarily to weather events and other natural disasters	Short duration, cyclical, uncorrelated, and potentially high losses in extreme events	5-15%
Litigation Claims	Third party funding to pursue litigation in exchange for a share of future settlement/award proceeds	Short duration, 6-24 months; uncorrelated with other credit assets	8-12%

¹² Net Target Returns reflected in the chart are estimates provided by Cliffwater's research team based on prior experience and observations within the industry. There is no assurance that these Net Target Returns will be achieved. This chart is for illustrative purposes only.

Performance Expectations for Private versus Public Credit

An ongoing research focus for Cliffwater has been the relative performance of private assets compared to equivalent public assets.

Our research into private equity performance shows a significant and persistent **3-4%** incremental return for private equity compared to public equity, when measured over full market cycles.¹³ This historical level of outperformance is consistent with early (1980s) investor benchmarks for private equity targeting S&P 500 Index +3% returns over longer time periods. Our research also finds that institutional private equity investors individually, as well as a group, were able to experience favorable private equity outcomes.

The institutional performance of private real estate compared to public real estate (equity REITs) is less conclusive. On average, cap rates for private real estate exceed public REIT dividend yields by 2% over time¹⁴ but actual private real estate performance achieved by institutional investors varies widely and the average return falls below REIT returns.¹⁵ Our belief is that a premium return potentially exists for private real estate but has not been systematically captured due to poor manager implementation.

More recently, our research has extended to private credit with the development and publication of the Cliffwater Direct Lending Index, which provides a performance track record for private middle market corporate loans going back to 2004.¹⁶

Our research shows a 3-4% return premium for private credit compared to liquid credit, comparable to the return premium for private equity when compared to public equity. Our finding is based upon:

1. In a mezzanine performance study covering 20 vintage years¹⁷, we found that mezzanine debt fund returns exceeded high yield bond returns by an annualized **3.36%**.
2. In the same study, we found that the Cliffwater Direct Lending Index (CDLI) produced a return that was **3.55%** above the Bloomberg Barclays High Yield Loan Index, when both indices are adjusted for fees and expenses.
3. In a comparison of yield-to-maturity, we report a 4.83% gross yield spread and **3.17% net yield spread** between the CDLI and the Bloomberg Barclays High Yield Bond Index.¹⁸

Early investors in private credit have used benchmarks tied to the S&P/LSTA Leveraged Loan Index plus a spread, typically 1% to 3%, following a benchmark methodology commonly used by private equity investors.¹⁹ Our performance findings support this type of benchmark though we

¹³ See “An Examination of Private Equity Performance among State Pensions”, August 2017, found at www.Cliffwater.com, for a recent performance study covering the last 15 years which concluded that private equity outperformed public equity by 4.4%, annually.

¹⁴ See “Fourth Quarter 2017 Market Outlook & Asset Allocation” for a history of private versus public real estate cap spreads, found at www.Cliffwater.com.

¹⁵ See “An Examination of State Pension Performance, 2007-2016”, September 2017, found at www.Cliffwater.com, for state pension real estate performance.

¹⁶ The Cliffwater Direct Lending Index (the “CDLI”) is an index comprised of all underlying assets held by public and private Business Development Companies that satisfy certain eligibility requirements. The CDLI is asset-weighted by reported fair value. Any information presented prior to the Launch Date (September 30, 2015) of the CDLI is back-tested. See “The Investment Opportunity in U.S. Middle Market Direct Lending” in *The Journal of Alternative Investments*, Summer 2017, for a more detailed description of the CDLI and additional CDLI disclosures at the end of this report.

¹⁷ See “U.S. Mezzanine Debt”, February 2017, found at www.Cliffwater.com.

¹⁸ See “2017 Q2 Report on U.S. Direct Lending” found at www.Cliffwater.com for most recent quarterly report.

¹⁹ Examples using this benchmark approach include the Arizona State Retirement System with a 10% allocation to private debt and an S&P/LSTA+2.5% benchmark and the South Carolina Retirement Systems with a 6% allocation to private debt and an S&P/LSTA+1.50% benchmark. Differences in spread may be related to risk-taking, i.e., leverage or credit seniority.

would encourage investors to also benchmark private credit funds against the CDLI or a universe of comparable private credit funds.

Allocations to Private Credit

Allocation decisions involving private assets, whether equity, real estate, or credit, are challenging, with no commonly accepted approach. Liquidity penalties, public proxies, and risk “unsmoothing” processes are some of the ways that practitioners try to fit private assets into the traditional mean-variance framework underpinning most asset allocation studies. Almost always, unconstrained optimization results in a high and uncomfortable allocation to privates which are then reduced by imposing constraints on the maximum allocation to private assets.

We have found that the most useful approach is to identify an enterprise specific maximum allocation to private investments and then allocate that capacity to asset classes where private investing offers the greatest risk-adjusted opportunity.

Assuming sufficient capacity for privates, our research and experience suggests that institutions with longer investment horizons should consider allocating most of their credit allocation to private credit due to (1) past performance for private credit, driven by higher yield, that has been consistently above public credit, (2) better clarity on future performance because investments are yield-driven rather than capital gains driven, and (3) the give up in liquidity for private credit investments is expected to be much less severe than private equity or real estate due to a shorter effective life.

Conclusion

The credit markets have evolved to a stage that investors should identify credit as an asset class separate from equity and interest rates. These liquid and illiquid credit opportunities offer characteristics not generally found in standard asset classes, such as higher current yield and lower volatility. Important as well are opportunities for value accretion through active management, primarily focused on minimization of credit losses, as past performance of individual private credit managers suggests that active management has significant potential to add incremental value in private credit.

As general guidance, Cliffwater’s research suggests a separate 10% to 20% allocation to a credit driven asset class, comprised principally of private credit investments. However, enterprises with greater cash demands or shorter dated liabilities might consider higher allocations.²⁰ Credit benchmarks linked to a public index such as the S&P/LSTA Leveraged Loan Index plus a spread are reasonable but investors with high private credit allocations should consider an index of private investments such as the CDLI or a peer universe of private credit funds.

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²⁰ Certain insurance reserves, healthcare reserves, and frozen pension liabilities are examples where higher credit allocations may be more appropriate.

Disclosures

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There can be no assurance that any expected rate of return, risk, or yield will be achieved. Rate of return, risk, and yield expectations are subjective determinations by the Cliffwater based on a variety of factors, including, among other things, investment strategy, prior performance of similar strategies, and market conditions. Expected rate of return, risk, and yield may be based upon assumptions regarding future events and conditions that prove to be inaccurate. Expected rate of return, risk, and yield should not be relied upon as an indication of future performance and should not form the primary basis for an investment decision. No representation or assurance is made that the expected rate of return, risk, or yield will be achieved.

The Cliffwater Direct Lending Index (the "CDLI") is an index comprised of all underlying assets held by public and private Business Development Companies ("BDCs") that satisfy certain eligibility requirements. The CDLI is asset-weighted by reported fair value. Cliffwater believes that the CDLI is representative of the direct lending asset class. The CDLI is owned exclusively by Cliffwater, and is protected by law including, but not limited to, United States copyright, trade secret, and trademark law, as well as other state, national, and international laws and regulations. Cliffwater provides this information on an "as is" and "as available" basis, without any warranty of any kind, whether express or implied.

Past performance of the CDLI is not an indication of future results. It is not possible to invest directly in the CDLI. The CDLI returns shown are not based on actual advisory client returns and do not reflect the actual trading of investible assets. The performance of the CDLI has not been reviewed by an independent accounting firm and has been prepared for informational purposes only.

Index returns do not reflect payment of any sales charges or fees a person may pay to purchase the securities underlying the CDLI or a product that is intended to track the performance of the CDLI. The imposition of these fees and charges would cause the actual and back-tested performance of these securities or products to be lower than the CDLI performance shown.

Any information presented prior to the Launch Date (September 30, 2015) of the CDLI is back-tested. Back-tested performance is not actual performance, but is hypothetical. The back-tested calculations are based on the same methodology that was in effect when the CDLI was officially launched. Please refer to the methodology paper for the CDLI (available at www.CliffwaterDirectLendingIndex.com) for more details about the CDLI, including the Base Date/Value (September 30, 2004 at 1,000) and the Launch Date of the CDLI and the manner in which the CDLI is rebalanced, the timing of such rebalancing and the eligibility criteria for the CDLI.

Prospective application of the methodology used to construct the CDLI may not result in performance commensurate with any back-tested returns shown. The back-test period does not necessarily correspond to the entire available history of the CDLI. Another limitation of back-tested hypothetical information is that generally the back-tested calculation is prepared with the benefit of hindsight. Back-tested data reflect the application of the CDLI methodology and selection of the CDLI constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the financial markets in general which cannot be, and have not been, accounted for in the preparation of the CDLI information set forth, all of which can affect actual performance.

When Cliffwater was unable to determine the nature of a BDC's investments because of limited information included in historical SEC filings, Cliffwater did not apply the portfolio composition criteria (at least 75% of total investments represented by direct loans) to the BDC. All other eligibility criteria were applied to determine whether to include the BDC in the historical CDLI composition and return. All CDLI returns and characteristics are reported with a 2.5 month lag to allow sufficient time for SEC filings.

The CDLI may include inaccuracies or typographical errors. Due to various factors, including the inherent possibility of human or mechanical error, the accuracy, completeness, timeliness and correct sequencing of such information and the results obtained from its use are not guaranteed by Cliffwater.

The CDLI is derived from sources that are considered reliable, but Cliffwater does not guarantee the veracity, currency, completeness or accuracy of the CDLI or other information furnished in connection with the CDLI. No representation, warranty or condition, express or implied, statutory or otherwise, as to condition, satisfactory quality, performance, or fitness for purpose are given or duty or liability assumed by Cliffwater in respect of the CDLI or any data included therein, omissions therefrom or the use of the CDLI in connection with any product, and all those representations, warranties and conditions are excluded save to the extent such exclusion is prohibited by applicable law.

References to market or composite indices (such as the S&P 500), benchmarks or other measures of relative market performance over a specified period of time (each, an "index") are provided for information only. Reference to an index does not imply that a portfolio will achieve returns, volatility or other results similar to the index. The composition of an index may not reflect the manner in which a portfolio is constructed in relation to expected or achieved returns, portfolio guidelines, restrictions, sectors, correlations, concentrations, volatility or tracking error targets, all of which are subject to change over time.

The Bloomberg Barclays High Yield Loan Index provides broad and comprehensive total return metrics of the universe of syndicated term loans. To be included in the index, a bank loan must be dollar denominated, have at least \$150 million funded loan, a minimum term of one year, and a minimum initial spread of LIBOR+125.

The Bloomberg Barclays U.S. High Yield Index (Bloomberg Barclays High Yield Bond) covers the universe of fixed rate, non-investment grade debt. Eurobonds and debt issues from countries designated as emerging markets (sovereign rating of Baa1/BBB+/BBB+ and below using the middle of Moody's, S&P, and Fitch) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included.

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