

High-yield bonds and floating-rate loans: Is indexing a sensible choice?

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- Index-based exchange-traded funds (ETFs) have been available for high-yield bonds since 2007 and for floating-rate loans since 2011.
- To date, the investment performance of index ETFs in these “leveraged credit” sectors has been distinctly unimpressive; as a group, leveraged credit index ETFs have underperformed most actively managed mutual funds in the same category by wide margins and have failed to deliver asset class returns.
- This study identifies and analyzes the sources of historical underperformance of index ETFs versus actively managed mutual funds in the high-yield bond and floating-rate loan fund categories, and examines whether such underperformance is likely to persist.
- We conclude that, in leveraged credit, index ETFs have built-in performance disadvantages that argue against their widespread use. With limited exceptions, we believe that those seeking exposure to the high-yield bond and floating-rate loan asset classes would be better served investing in actively managed mutual funds.



Since the introduction of the first equity index ETF in 1993, investors have poured more than \$2 trillion into these funds to create a market of over 1,200 offerings in just the U.S. alone. By and large, investors' faith in equity index ETFs has been rewarded. Among funds in the nine primary Morningstar equity style boxes, index ETFs outperformed their actively managed mutual fund counterparts by an average of 140 basis points (bps) annually for the five years ended September 30, 2018. On average, expense ratios of equity index ETFs in these categories averaged 58 bps lower than corresponding active mutual funds – an edge that accounted for more than a third of equity index ETFs' outperformance over the five-year period.¹

Index ETFs focused on investing in high-yield bonds and floating-rate loans are a more recent development, dating from 2007 and 2011, respectively. Given the investment success of equity index ETFs, investors might assume that performance benefits would similarly accrue to index ETFs in the high-yield bond and floating-rate loan categories, which we refer to collectively as “leveraged credit.” To date, that assumption has been wrong. In fact, since high-yield bond and floating-rate loan index ETFs were first launched, they have significantly underperformed corresponding actively managed mutual funds.

Despite a record of underperformance since their inception, leveraged credit index ETFs have gained considerable assets and continue to attract significant inflows. As of September 30, 2018, the 35 high-yield bond index ETFs listed for trading in the U.S. had net assets of \$42.4 billion, or 14.4% of the Morningstar High Yield category (including ETFs and mutual funds). The three floating-rate loan index ETFs had net assets of \$8.1 billion, or 5.3% of the Morningstar Bank Loan category (including ETFs and mutual funds). For the three years ended September 30, 2018, net flows into high-yield bond index ETFs were \$10.6 billion, compared with a net outflow of \$37.4 billion for actively managed, open-end high-yield bond mutual funds. Over the same period, floating-rate loan index ETFs attracted net inflows of \$3.1 billion, compared with \$24.6 billion flowing into actively managed, open-end floating-rate funds.²

In this study, our three primary goals are to:

1. Document the historical performance of index ETFs versus actively managed mutual funds in the high-yield bond and floating-rate loan categories.
2. Identify the key contributors to the observed relative performance advantage of actively managed mutual funds over index ETFs in leveraged credit.
3. Offer insight into the factors driving the relative returns of active versus passive funds in high-yield bond and floating-rate loan categories, and provide advice regarding the appropriate use of index ETFs in leveraged credit.

We begin first with the track records.

1. Historical performance

Exhibits A-1 and A-2 compare the risk-return profiles of index ETFs and actively managed mutual funds in the high-yield bond and floating-rate loan categories, as classified by Morningstar. In Exhibits A-1 and A-2 (and throughout this study), returns are stated net of expenses and risk is measured as the standard deviation of monthly returns. Averages reflect all funds in the category in existence throughout the period, weighted by beginning-of-period net assets for all share classes. For mutual funds with multiple share classes, indicated returns are those of “institutional” or similar (no-load/no 12b-1) share classes most commonly used by financial advisors overseeing discretionary, fee-based client accounts. Mutual fund returns reflect performance at net asset value (NAV) and ETF returns are based on market closing prices, in each case with fund distributions reinvested.

As shown in Exhibit A-1, in the high-yield bond category, actively managed mutual funds outperformed index ETFs by an average of 55 bps annually over three years, and by an average of 87 bps over five years, for periods ended September 30, 2018. The volatility of returns was comparable over both periods.

¹Eaton Vance research based on Morningstar data, comparing actively managed fund net returns with ETF market returns, on an asset-weighted basis, as of September 30, 2018, for the nine style boxes: large-cap growth, large-cap value, large-cap blend, medium-cap growth, medium-cap value, medium-cap blend, small-cap growth, small-cap value, small-cap blend.

²In the Morningstar High Yield Category, there are eight actively managed ETFs representing 4.7% of the high-yield ETF universe assets, as of September 30, 2018. In the Morningstar Bank Loan Category, active ETFs comprise 39.7% of ETF assets. There are just three open-end mutual funds with passive index strategies, in total, in both Morningstar categories, totaling under 0.5% of open-end fund assets. This paper focuses on active, open-end mutual funds and passive index ETFs because they represent the majority of assets in their categories. Note that subsequently we refer to bank loans as “floating-rate loans,” reflecting the more common naming convention for the asset class.



For floating-rate loan funds, Exhibit A-2 shows that active mutual funds outperformed index ETFs by an average of 83 bps annually over three years, and by an average of 99 bps annually over five years, for periods ended September 30, 2018. The volatility of returns was comparable over both periods.

In Exhibit B, we examine the comparative performance of index ETFs versus active mutual funds over the entire period since the first index ETF was introduced in high-yield bonds (April 2007) and floating-rate loans (March 2011). Through September 30, 2018, over 100 monthly rolling three-year periods since the launch of the first high-yield bond index ETF, the asset-weighted average

performance of actively managed mutual funds in the category exceeded that of the average high-yield bond index ETF 98.0% of the time (100 of 102 periods). For the 55 monthly rolling three-year periods since the first floating-rate loan index ETF was brought to market, the asset-weighted average performance of actively managed floating-rate loan mutual funds beat that of the average floating-rate loan index ETF 94.6% of the time (52 of 55 periods).

To validate the observed outperformance of active mutual funds versus index ETFs in leveraged credit, we analyzed the historical returns of a variety of different subsets of leveraged credit funds over multiple time

Exhibit A-1

Actively managed mutual funds have outperformed index ETFs in high-yield bonds.

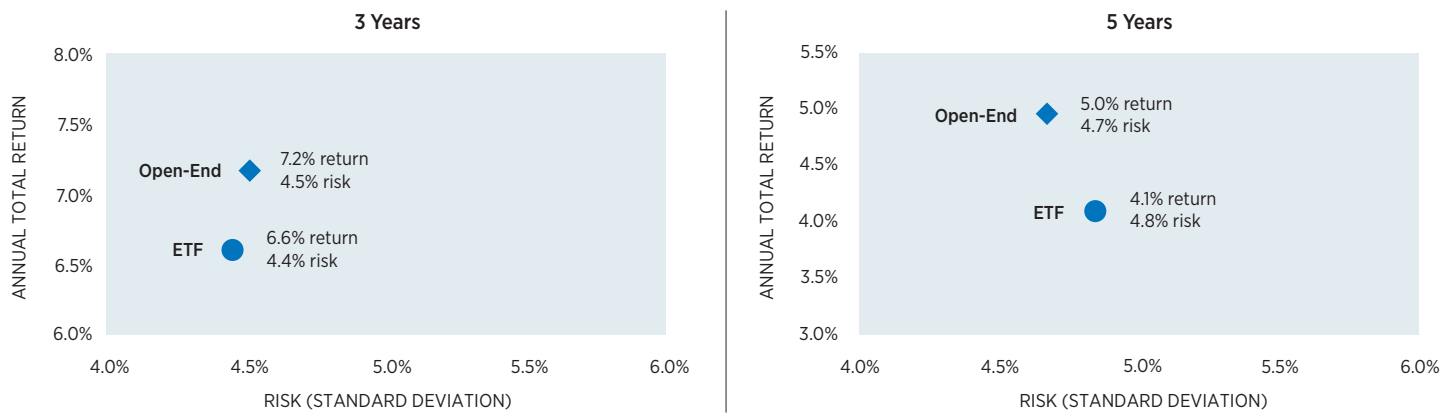
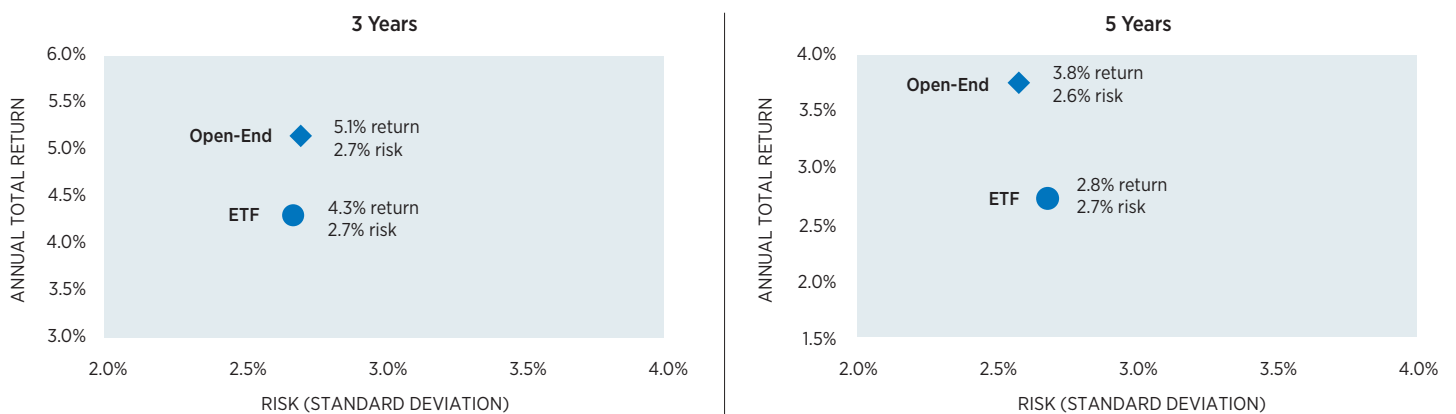


Exhibit A-2

Actively managed mutual funds have also outperformed index ETFs in floating-rate loans.



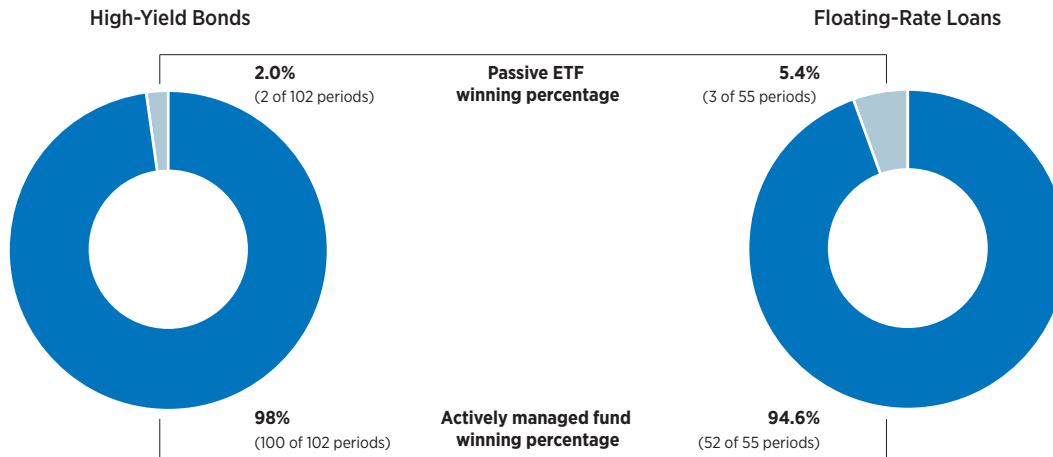
Sources: Eaton Vance Management and Morningstar, as of September 30, 2018. Total return is stated net of fund expenses and risk is the standard deviation of monthly returns. Averages reflect all funds in the Morningstar High-Yield Bond and Bank Loan categories in existence throughout the three-year and five-year periods ended September 30, 2018, weighted by beginning-of-period net assets. The Morningstar High-Yield Bond category comprises U.S.-based issuers of below-investment-grade debt. The Morningstar Bank Loan category comprises U.S. issuers of floating-rate debt, typically secured by corporate assets. For mutual funds with multiple share classes, returns are those of "institutional" or similar (no-load/no 12b-1) share classes, which are most commonly used by financial advisors overseeing discretionary, fee-based client accounts. We exclude funds with incomplete data. Mutual fund returns reflect performance at NAV and ETF returns are based on market closing prices, in each case with fund distributions reinvested. Past performance is no guarantee of future results.



Exhibit B

In leveraged credit, actively managed mutual funds have consistently outperformed index ETFs.

The percentage of rolling three-year periods in which actively managed mutual funds outperformed index ETFs.



Sources: Eaton Vance Management and Morningstar, as of September 30, 2018. Compares total return at NAV, net of expenses, of the average actively managed mutual fund in the Morningstar High-Yield Bond and Bank Loan categories to the average market price return of index ETFs in the same categories. Averages reflect all funds in existence throughout each rolling three-year period since the first index ETF was introduced in high-yield bonds (April 2007) and floating-rate loans (March 2011), weighted by beginning-of-period net assets. For mutual funds with multiple share classes, returns are those of “institutional” or similar (no-load/no 12b-1) share classes, which are most commonly used by financial advisors overseeing discretionary, fee-based client accounts. Mutual fund returns reflect performance at NAV and ETF returns are based on market closing prices, in each case with fund distributions reinvested. Past performance is no guarantee of future results.

periods, variously considering only the 10 largest and the 25 largest active funds in each category, and only funds with at least \$1 billion of net assets. In each comparison, actively managed mutual funds outperformed corresponding index ETFs on both an absolute and risk-adjusted basis, with excess return patterns similar to those shown in Exhibits A and B.

2. Relative performance analysis

Our historical performance analysis in section 1 compares the average of all actively managed funds with the average of all passive index ETFs in the Morningstar high-yield and floating-rate categories. While this approach was appropriate to demonstrate the persistent outperformance of active versus passive in leveraged credit funds, it was not optimal for our attribution analysis, in which we disaggregate the key contributors to relative performance. This is because passive ETFs use narrow, proprietary indexes as benchmarks, with differing construction methodologies – most notably, some include expenses in their benchmark calculation and others do not.

Thus, our attribution analysis compares the largest index ETF, rather than the average of all index ETFs in the

category, with the average of all actively managed funds. Focusing on each category’s largest passive ETF provides a clear example of the dynamics of relative performance, but we do not hold it out as a definitive attribution of the whole ETF universe. Moreover, as a practical matter, as we detail below, both high-yield and floating-rate loan ETF universes have single dominant funds – something that makes the analysis relevant for many investors.

As shown in Exhibit C, we define “Active Fund Net Excess Return” (AER) as the difference between the asset-weighted average return at NAV (net of expenses) of actively managed mutual funds in each category and the market price return of the largest index ETF in the same category. In our analysis, we break AER into five components:

- (a) The average annual gross (pre-expense) return of active funds in excess of their defined market benchmark (Active Fund Gross Relative Performance).
- (b) The average annual return of the market benchmarks used by active funds over the average annual return of the largest index ETF’s benchmark (Benchmark Return Differential).



Exhibit C

The performance differential between active mutual funds and index ETFs is the sum of five components.

Active Fund Excess Return (AER)	=	Active Fund Gross Relative Performance + Benchmark Return Differential + Index ETF Benchmark Tracking + Index ETF Trading Efficiency + Expense Ratio Differential
Active Fund Gross Relative Performance	=	Annual Gross (Pre-Expense) Return of Average Active Fund – Benchmark Return of Average Active Fund
Benchmark Return Differential	=	Benchmark Return of Average Active Fund – Benchmark Return of Largest Index ETF
Index ETF Benchmark Tracking	=	Benchmark Return of Largest Index ETF – Gross (Pre-Expense) Return at NAV of Largest Index ETF
Index ETF Trading Efficiency	=	Return at NAV of Largest Index ETF – Market Price Return of Largest Index ETF
Expense Ratio Differential	=	Expense Ratio of Largest Index ETF – Expense Ratio of Average Active Fund

Source: Eaton Vance as of December 31, 2017.

- (c) The average annual return of the largest index ETF's benchmark over the average annual gross (pre-expense) return at NAV of the index ETF itself (Index ETF Benchmark Tracking).
- (d) The average annual return of the largest index ETF based on NAV over its average annual market price return (Index ETF Trading Efficiency).
- (e) The average annual expense ratio of the largest index ETF less the average annual expense ratio of active funds in the category (Expense Ratio Differential).

Exhibits D-1 and D-2 illustrate the results of this analysis. Exhibit D-1 compares the rolling three-year asset-weighted average annual return at NAV of actively managed high-yield bond mutual funds versus the market price return of iShares iBoxx \$ High Yield Corporate Bond ETF (NYSE: HYG) over the life of HYG through September 30, 2018. As the largest high-yield bond index ETF, HYG accounted for approximately 36% of high-yield bond index ETF assets as of September 30,

2018. As shown in Exhibit D-1, AER for high-yield bond funds was positive over 100 of 102 rolling three-year periods, averaging 93 bps annually.

Exhibit D-2 similarly compares the rolling three-year asset-weighted average annual return at NAV of actively managed floating-rate loan funds to the market price return of Invesco Senior Loan ETF (NYSE: BKLN) over the life of BKLN through September 30, 2018. BKLN is the largest index ETF in the floating-rate loan category, representing 92% of passive index ETF's assets as of September 30, 2018. As shown in Exhibit D-2, AER for floating-rate loan funds was positive for 52 of 55 rolling three-year periods, averaging 84 bps annually.

Exhibits D-1 and D-2 show the respective contributions to AER of Active Fund Gross Outperformance, Benchmark Return Differential, Index ETF Benchmark Tracking, Index ETF Trading Efficiency and Expense Ratio Differential for the high-yield bond and floating-rate loan fund categories from the inception of the largest index ETF in the category through September 30, 2018.



Exhibit D-1

Actively managed high-yield bond mutual funds outperformed HYG in 100 of 102 rolling three-year periods.

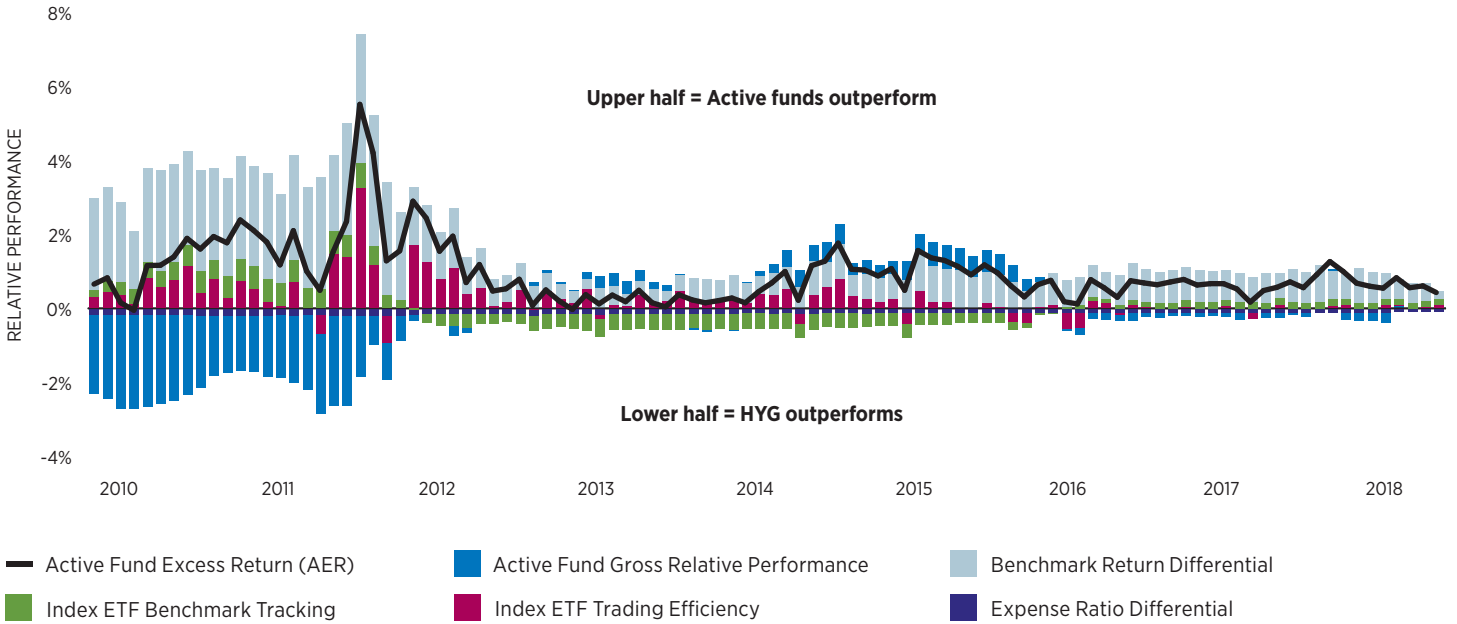
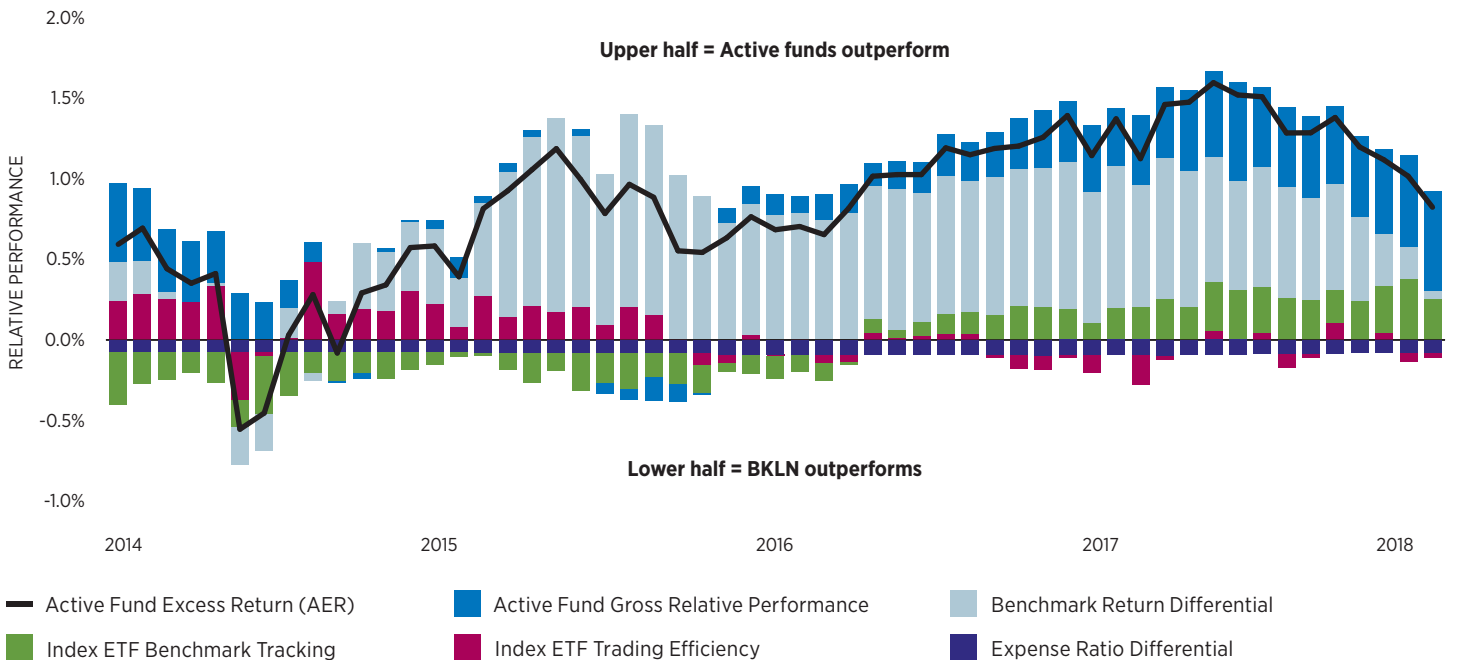


Exhibit D-2

Actively managed floating-rate loan mutual funds outperformed BKLN in 52 of 55 rolling three-year periods.



Sources: Eaton Vance Management and Morningstar, as of September 30, 2018. Exhibit D-1 compares the rolling three-year asset-weighted average annual return at NAV of actively managed mutual funds in the Morningstar High-Yield Bond category versus the market price return of iShares iBoxx \$ High Yield Corporate Bond ETF (NYSE: HYG) from the inception of HYG in April 2007 through September 30, 2018. Exhibit D-2 compares the rolling three-year asset-weighted average annual return at NAV of actively managed mutual funds in the Morningstar Bank Loan category to the market price return of Invesco Senior Loan ETF (NYSE: BKLN) from the inception of BKLN in March 2011 through September 30, 2018. Averages reflect all funds in existence throughout each three-year period, weighted by beginning-of-period net assets. For mutual funds with multiple share classes, returns are those of “institutional” or similar (no-load/no 12b-1) share classes, which are most commonly used by financial advisors overseeing discretionary, fee-based client accounts. Mutual fund returns reflect performance at NAV and ETF returns are based on market closing prices, in each case with fund distributions reinvested. Past performance is no guarantee of future results.



How claims supporting fixed-income indexing fall short

Advocates of indexing sometimes assert that the case for investing on a passive basis applies equally to equities and fixed income. We disagree. Here's our response to some of the claims made by advocates of fixed-income indexing:

Claim #1: The largest weights in fixed-income indexes tend to be large, blue chip companies, similar to broad equity indexes. Different from equity indexes, weightings in fixed-income indexes are usually based on the amount of an issuer's outstanding debt – the more debt, the greater the index weighting. By definition, the constituents of high-yield bond and floating-rate loan indexes are companies rated below investment grade, certainly not “blue chip” by any standard. With lower-quality income investments, does it make sense to always have the highest exposures to the most indebted issuers in an asset class? That's how high-yield bond and floating-rate loan indexes are normally constructed.

Claim #2: Index ETFs can be used as building blocks to construct custom portfolios. While true, the same applies to actively managed funds. In high-yield bonds, floating-rate loans and other income asset classes in which actively managed mutual funds have consistently outperformed index ETFs, using index ETFs as building blocks may come at a significant cost to portfolio returns.

Claim #3: Index ETFs can closely replicate their benchmarks' returns without owning all the constituents of the index. This acknowledges that broad-market fixed-income benchmarks are generally not investable. While it's true that index ETFs may use a “sampling” approach to index replication to reduce transaction costs, this flexibility pales in comparison to the arsenal of tools and strategies that actively managed fixed-income funds can tap to seek improved returns.

Claim #4: Indexing transforms fixed-income investing by providing standardized, predictable and efficient exposures that greatly simplify portfolio construction. Einstein once said that everything should be made as simple as possible, but not simpler. Simplification that can erode investor returns by removing the potential to exploit the pricing inefficiencies that frequently arise in credit markets is not progress.

1. ■ Active Fund Gross Relative Performance = Annual Gross (Pre-Expense) Return of Average Active Fund – Benchmark Return of Average Active Fund

High-yield bond funds: Active Fund Gross Relative Performance was negative for rolling three-year periods including the global financial crisis, and mixed thereafter. For the three-year periods ended April 2010 through December 2012 – which include the global financial crisis – Active Fund Gross Relative Performance averaged -140 bps annually. Thereafter, the contribution of Active Fund Gross Relative Performance averaged +10 bps annually. Over the entire measurement period, Active Fund Gross Relative Performance averaged -39 bps per year.

The key point in this comparison is that indexes are theoretical constructs – their designers may choose to have them reflect transaction costs or not. The benchmarks used by most active managers do not reflect transaction costs. In the real world, such costs are a hurdle that managers must overcome.

We postulate that the divergence in Active Fund Gross Relative Performance during the global financial crisis and in the post crisis period reflects the reduced liquidity and higher trading costs absorbed by active funds – keep in mind that such expenses tend to be higher for leveraged credit than other fixed-income sectors. We believe it is notable that for the five years after 2012, active managers outperformed their benchmarks, on average, despite the drag of flow-related transaction and other portfolio costs that those benchmarks did not share.

Floating-rate loan funds: Over the measurement period, Active Fund Gross Outperformance averaged +24 bps annually. The first rolling three-year period in this analysis ends in 2014, so the results largely do not reflect the impact of the financial crisis, which worked to the detriment of high-yield active managers, as described above.

2. ■ Benchmark Return Differential = Benchmark Return of Average Active Fund – Benchmark Return of Largest Index ETF

High-yield bond funds: Benchmark Return Differential was the largest contributor to AER, averaging +121 bps annually over the measurement period.

Floating-rate loan funds: As with high-yield bond funds, Benchmark Return Differential was the biggest contributor to the AER of floating-rate loan funds, averaging +63 bps per year over the period measured.



In leveraged credit, actively managed funds customarily benchmark themselves against broad-based indexes that reflect the entire asset class. The most common benchmarks for actively managed high-yield bond funds are the ICE BofAML U.S. High-Yield Index and the Bloomberg Barclays U.S. Corporate High Yield Index; among actively managed floating-rate loan funds, the most common benchmarks are the S&P/LSTA Leveraged Loan Index and the Credit Suisse Leveraged Loan Index. Each of these benchmarks is, by design, representative of the full market opportunity set available to investors in the asset class.

In contrast, index ETF benchmarks for the high-yield bond and floating-rate loan categories focus on subsets of the broad-based indexes. The benchmark for HYG is the Markit iBoxx USD Liquid High Yield Index (iBoxx Liquid Index). That index is limited to issuers with at least \$1 billion of outstanding high-yield debt and individual issues of at least \$400 million – currently about 1,000 issues versus about 2,000 in the ICE BofAML U.S. High-Yield Index. BKLN's benchmark, the S&P/LSTA Leveraged Loan 100 Index (Leveraged Loan 100 Index), is restricted to the 100 largest eligible loans, versus more than 1,000 in the S&P/LSTA Leveraged Loan Index.

The key to explaining why the largest high-yield and floating-rate loan ETF indexes have underperformed lies in recognizing the primary goal of index ETFs: To minimize tracking error relative to their benchmarks. BKLN sought to achieve this by adopting a benchmark with a very narrow universe of issues, which is easier for the ETF to replicate than a broad index. In contrast, HYG's index is broader, but it is designed to reflect real-world transaction costs, mainly associated with index reconstitution rules – an approach that lets the ETF more closely track benchmark performance.

But while both approaches helped the ETFs reduce tracking error, they introduced disadvantages for the two ETF indexes in terms of relative performance versus the broad indexes of actively managed funds.

In the case of the Leveraged Loan 100 Index, used by BKLN, the greater concentration of the index, with just 100 issuers, results in more exposure to individual companies and idiosyncratic risk. The smaller universe of names inevitably leads to overrepresentation of some issuers, industry groups and credit quality tiers. Unlike equities, the upside potential of performing credit investments is constrained – in the best case, the issuer pays interest and principal as due – the greater risk of

following a narrow credit benchmark may not be offset by higher upside potential. Moreover, credit market indexes are typically capitalization weighted, meaning that they are composed of the largest companies with the highest debt levels.³ This exacerbates idiosyncratic risk for narrower credit benchmarks.

For the iBoxx Liquid Index, the benchmark for HYG, the inclusion of transaction costs imposes, by definition, a drag in performance relative to the broad indexes used by actively managed funds. As noted earlier, benchmarks like the ICE BofAML U.S. High-Yield Index and the Bloomberg Barclays U.S. Corporate High Yield Index ignore transaction costs in their pricing. Turnover-related transaction costs associated with ongoing index reconstitution are enough to impose a significant burden in credit sectors.

This discussion highlights the fact that index replication risk can be moved around, but not eliminated, much like the first law of thermodynamics, which states that energy can neither be created nor destroyed, just transformed from one form to another. It's a trade-off – narrow indexes have higher idiosyncratic risk but are easier to replicate, while broader indexes have lower idiosyncratic risk but are more difficult, and potentially more costly, to replicate.

We speculate that ETF performance may also be hindered by the predatory trading known as “front-running,” in which other market participants buy and sell ahead of the ETF's anticipated trades. Unlike actively managed mutual funds, index ETFs disclose their portfolio holdings and/or the composition of their benchmark index on a daily basis. This transparency, while sometimes cited as a benefit of ETF investing, may make index ETFs and their benchmarks susceptible to front-running. Front-running has the potential to be especially damaging to the performance of index ETFs (and their benchmarks) in asset classes such as high-yield bonds and floating-rate loans, which trade with wider bid-ask spreads and less liquidity than listed stocks.

To summarize our first two components of relative performance: Active managers are measured against indexes that don't reflect transactions costs. They have mitigated or overcome this hurdle by generating alpha to the benefit of investors – something ETFs cannot do. Instead, the ETFs have carefully designed custom benchmarks so they can track them better, which enhances performance “optics” but not actual investment returns.

³Both broad and narrow indexes have the greatest weights in issuers with the highest debt, because both kinds of benchmarks are market-capitalization weighted. But the highest-debt issuers are proportionally greater in the narrow indexes.



3. ■ **Index ETF Benchmark Tracking = Benchmark Return of Largest Index ETF - Gross (Pre-Expense) NAV Return of Largest Index ETF**

High-yield bonds: On a gross (pre-expense) basis, HYG slightly underperformed its benchmark from the end of its first three-year rolling period in 2010 through the three-year rolling period ended in 2012 -- a stretch that included the global financial crisis. After that, through the three-year period ended in 2018, HYG slightly outperformed its benchmark. For the entire measurement period, HYG's gross returns matched its benchmark. This is not surprising, because the benchmark embeds transaction costs that are similar to those experienced by the ETF.

Floating-rate loans: BKLN also matched its benchmark on a gross basis, as ETF Benchmark Tracking contributed -1 bp annually to AER over the measurement period (negative results indicate a favorable contribution to ETF relative performance). As with high-yield bond funds, Index ETF Benchmark Tracking was the least significant of the identified factors contributing to AER. Again, the ability of BKLN to keep pace with its index is unsurprising, because the benchmark was designed to minimize tracking error.

4. ■ **Index ETF Trading Efficiency = Return at NAV of Largest Index ETF - Market Price Return of Largest Index ETF**

High-yield bonds: Index ETF Trading Efficiency contributed an average of +25 bps annually to AER over the study period, as HYG's return at NAV exceeded its market price return over most rolling three-year periods (positive results indicate an unfavorable contribution to ETF relative performance).

Floating-rate loans: Similarly, Index ETF Trading Efficiency contributed an average of +6 bps annually to AER over the full measurement period, as BKLN's return at NAV, on average, exceeded its market price return (positive results indicate an unfavorable contribution to ETF relative performance).

Variability in the premiums/discounts to NAV at which ETFs trade may also contribute to the volatility of ETF investor returns in a manner not present for mutual funds, which transact consistently at NAV. While the ability to buy and sell ETF shares intraday may be a convenience, this added liquidity is not free. Efficient secondary market trading of ETFs depends on the continuous presence of market makers committing capital in pursuit of arbitrage profits earned by buying

ETF shares at a discount to NAV and selling ETF shares at a premium. For the ETF arbitrage pricing mechanism to function, investors not acting as arbitrageurs must, on balance, purchase ETF shares at premiums to NAV and sell ETF shares at discounts. Recent academic research demonstrates the significant impact that ETF trading costs arising from variability in premiums/discounts can have on investor returns, particularly in less liquid asset classes such as high-yield bonds and floating-rate loans. In a study published in *Financial Analysts Journal* in the first quarter of 2017,⁴ Antti Petajisto concluded that "ETFs routinely exhibit some economically significant differences between the ETF share price and the value of the underlying portfolio, especially in less liquid asset classes, indicating that the investor may face an unexpected additional cost when trading ETFs."

In selecting between ETFs and mutual funds, investors must weigh the perceived advantages of intraday liquidity of ETFs against the added costs and risks of trading in the secondary market.

5. ■ **Expense Ratio Differential = Expense Ratio of Largest Index ETF - Expense Ratio of Average Active Fund**

High-yield bonds: Expense Ratio Differential contributed -15 bps to AER because the average expense ratio of actively managed high-yield bond funds exceeded HYG's expense ratio by an average of 15 bps annually over the study period (negative results indicate a favorable contribution to ETF relative performance). As of September 30, 2018, the expense ratio differential had shrunk to 7 bps-49 bps for HYG versus 56 bps for actively managed high-yield bond funds. Unlike equity index ETFs, high-yield bond index ETFs provide only modest savings in fund expenses.

Floating-rate loans: For floating-rate loan funds, Expense Ratio Differential contributed -8 bps to AER, as the average expense ratio of actively managed floating-rate loan funds exceeded BKLN's expense ratio by this amount over the study period (negative results indicate a favorable contribution to ETF relative performance). As of September 30, 2018, the expense ratio advantage was just 5 bps-65 bps for BKLN versus 70 bps for the average active floating-rate fund.

In leveraged credit, expense differentials between actively managed mutual funds and index ETFs are quite small, far less meaningful to performance results than in most equity fund categories.

⁴Petajisto, Antti. 2017. "Inefficiencies in the Pricing of Exchange-Traded Funds." *Financial Analysts Journal*, vol. 73: No. 1, 24-54.



3. Further insight into relative performance results

Some observers in the industry assume that the relative success of active credit sector funds is largely due to a lower-quality bias in their portfolios. To test this hypothesis, we first compared the asset-weighted average credit quality of actively managed mutual funds to the average credit quality of index ETFs in the high-yield bond and floating-rate loan asset classes over the five-year period ended December 31, 2017. We then compared the returns of each credit quality band within the asset class over this period to determine how differences in credit quality exposures contributed to relative performance.⁵

High-yield bonds: Over the five years ended December 31, 2017, actively managed high-yield bond funds had, on average, modestly lower exposure to BB-rated bonds, and higher exposure to B-rated bonds, than index ETFs in the high-yield bond fund category. Because BB-rated bonds outperformed B-rated bonds over the period, differences in credit quality exposures were, on balance, a performance headwind for actively managed high-yield bond funds, detracting from their relative returns over the five-year period. We conclude that differences in credit quality did not account for the better performance of actively managed mutual funds over index ETFs in high-yield bonds over the five years ended December 31, 2017.

Floating-rate loans: Similar to actively managed high-yield bond funds, actively managed floating-rate loan funds maintained somewhat higher average exposures to lower-rated credits (and less exposure to higher-rated credits) than index ETFs in the same asset class over the five years ended December 31, 2017. Unlike in high-yield bonds, lower-rated bank loan credits outperformed higher-rated credits over this period, contributing to the observed performance advantage of actively managed funds in floating-rate loans. Based on our attribution analysis, we estimate that only 15%-20% of active loan funds' outperformance over the five-year period is explained by differences in credit quality versus index ETFs.

Explaining the allure of leveraged credit index ETFs

Despite underperforming most actively managed mutual funds in their categories by wide margins, index ETFs have gained large followings and attracted significant investor flows in both high-yield bonds and floating-rate loans. As of September 30, 2018, high-yield bond index ETFs had grown to net assets of \$42.4 billion, equal to 14.4% of total net assets in the Morningstar U.S. High-Yield Bond Fund category (including both mutual funds and ETFs). As of that date, floating-rate loan index ETFs had attracted \$8.1 billion of net assets, representing 5.3% of the Morningstar U.S. Bank Loan Fund category total. What accounts for the allure of leverage credit index ETFs, given their weak performance histories?

Although we can only speculate, we attribute the commercial success of high-yield bond and floating-rate loan index ETFs to the halo surrounding the index ETF product category as a whole – and to widespread misperceptions about how, in leveraged credit, index ETFs are constructed and how they have performed. ETF sponsors incessantly promote the ability of index ETFs to provide low-cost exposure to asset class returns, and to deliver performance and tax efficiency that compares favorably to actively managed mutual funds. Repeat the mantra loud enough and long enough and it starts to feel true – even when it's not.

As index ETFs grow to occupy larger roles in investor portfolios, it is imperative for each application to receive appropriate scrutiny before a decision is made to invest. While there are some asset classes for which index ETFs have delivered on their promise, that's not the case in leveraged credit. Financial advisors and investors should not assume that index ETFs are always a sensible choice.

Using leveraged credit index ETFs

In considering the appropriate use of high-yield bond and floating-rate loan index ETFs, we find it helpful to evaluate how they stack up in terms of the advantages most commonly cited for index ETFs:

⁵Source: Eaton Vance, September 30, 2018. Credit ratings measure the quality of a bond based on the issuer's creditworthiness, with ratings ranging from AAA, being the highest, to D, being the lowest based on S&P's and Fitch's measures. Ratings of BBB- or higher by S&P and Fitch are considered to be investment-grade quality. For Moody's, the highest rating is Aaa and the lowest is C; Ratings of Baa3 or higher considered investment grade. Ratings are based largely on the ratings agency's analysis at the time of rating and are subject to change. The rating assigned to any particular security is not necessarily a reflection of the issuer's current financial condition and does not necessarily reflect its assessment of the volatility of a security's market value.



1. Lower cost.	NO (small advantage in fund expenses may be offset by premiums or discounts in ETF prices.)
2. Better performance.	NO (historical underperformance of leveraged credit index ETFs expected to persist.)
3. More tax efficient.	NO (capital gains distributions are seldom a concern for leveraged credit funds.)
4. More transparent.	YES (but at a meaningful performance cost.)
5. Intraday liquidity.	YES (but at a meaningful performance cost.)

In our judgment, leveraged credit index ETFs have not demonstrated that they deserve to have broad exposure in investor portfolios. Except in applications demanding access to intraday trading, we believe that investors seeking exposure to the high-yield bond and floating-rate loan asset classes would be better served investing in actively managed mutual funds.

High Yield Risk:

The value of investments held by the Fund may increase or decrease in response to economic, and financial events (whether real, expected or perceived) in the U.S. and global markets. There generally is limited public information about municipal issuers. As interest rates rise, the value of certain income investments is likely to decline. Investments in debt instruments may be affected by changes in the creditworthiness of the issuer and are subject to the risk of non-payment of principal and interest. The value of income securities also may decline because of real or perceived concerns about the issuer's ability to make principal and interest payments. Investments rated below investment grade (sometimes referred to as junk) are typically subject to greater price volatility and illiquidity than higher rated investments. The Fund's exposure to derivatives involves risks different from, or possibly greater than, the risks associated with investing directly in securities and other investments. Derivatives instruments can be highly volatile, result in leverage (which can increase both the risk and return potential of the Fund), and involve risks in addition to the risks of the underlying instrument on which the derivative is based, such as counterparty, correlation and liquidity risk. If a counterparty is unable to honor its commitments, the value of Fund shares may decline and/or the Fund could experience delays in the return of collateral or other assets held by the counterparty. No fund is a complete investment program and you may lose money investing in a fund. The Fund may engage in other investment practices that may involve additional risks and you should review the Fund prospectus for a complete description.

Floating-Rate Risk:

The value of investments held by the Fund may increase or decrease in response to economic, and financial events (whether real, expected or perceived) in the U.S. and global markets. Loans are traded in a private, unregulated inter-dealer or inter-bank resale market and are generally subject to contractual restrictions that must be satisfied before a loan can be bought or sold. These restrictions may impede the Fund's ability to buy or sell loans (thus affecting their liquidity) and may negatively impact the transaction price. It may take longer than seven days for transactions in loans to settle. Due to the possibility of an extended loan settlement process, the Fund may hold cash, sell investments or temporarily borrow from banks or other lenders to meet short-term liquidity needs. Loans may be structured such that they are not securities under securities law, and in the event of fraud or misrepresentation by a borrower, lenders may not have the protection of the anti-fraud provisions of the federal securities laws. Loans are also subject to risks associated with other types of income investments. Investments in debt instruments may be affected by changes in the creditworthiness of the issuer and are subject to the risk of non-payment of principal and interest. The value of income securities also may decline because of real or perceived concerns about the issuer's ability to make principal and interest payments. Investments rated below investment grade (sometimes referred to as junk) are typically subject to greater price volatility and illiquidity than higher rated investments. As interest rates rise, the value of certain income investments is likely to decline. Investments in foreign instruments or currencies can involve greater risk and volatility than U.S. investments because of adverse market, economic, political, regulatory, geopolitical, currency exchange rates or other conditions. Changes in the value of investments entered for hedging purposes may not match those of the position being hedged. No fund is a complete investment program and you may lose money investing in a fund. The Fund may engage in other investment practices that may involve additional risks and you should review the Fund prospectus for a complete description.



About Comparisons

Elements of this commentary include comparisons of different investment vehicles in the high-yield and floating-rate (leverage loan) sector, each of which has distinct risk and return characteristics including fee structure and trading. Investment vehicles shown are not insured by the FDIC and are not deposits or other obligations of, or guaranteed by, any depository institution. All investment vehicles shown are subject to risks, including possible loss of principal invested. Costs and expenses associated with investing in investment vehicles shown will vary, sometimes substantially, depending upon specific investment vehicles chosen. Unlike mutual funds, ETF shares trade on an exchange and are not individually redeemable from the fund. ETF shares are bought and sold at market-determined prices, which may vary throughout the trading day and may be higher or lower than net asset value (NAV). Investment return and principal value will fluctuate so that shares, when redeemed, may be worth more or less than their original cost. Returns are historical and are calculated by determining the percentage change in net asset value (NAV) or market price (MKT) with all distributions reinvested. Returns at market price are based on closing market price of the ETF. Index ETFs typically have lower fees than actively managed mutual funds. ETFs utilizing in-kind redemptions may pay out lower capital gains distributions than similar mutual funds, reducing or deferring shareholder taxes.

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