BLACKROCK®

Index your bonds

A guide to dispelling the myths

ICR0218U-416660-1373161

Introduction

Most investors are inherently familiar with index investing in the equity markets. Mutual funds and ETFs that track equity indices are commonly used by investors as core and tactical allocations. However, investors are less familiar with indexing in fixed income.

A growing number of publications, produced mainly by active managers, are questioning the validity of indexing in fixed income. Many of the generalizations stated in these pieces are born out of an incomplete understanding of how indexed fixed income exposures are actually managed and used in practice.

At BlackRock, we believe:

1. **All portfolio decisions are active,** including the choice to invest in index funds. In reality, most investors use a combination of both active and index funds.

2. **Investment strategies run along a continuum,** from broad-based market cap weighted funds to factor strategies to traditional actively managed funds to unconstrained portfolios that seek returns uncorrelated to the market.

3. **Each of these strategies play a distinct role** alongside each other in a portfolio. It is not a binary decision of one versus the other.

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All investment strategies have some element of “active” management. From the investor perspective, the decision to “go passive” is an active decision as are the choice of index and the vehicle through which to implement that view. Many investors who use ETFs and index products do so as building blocks in the context of asset allocation and portfolio construction or to express specific active views.

A popular expression today is that “bonds are different”, which infers that indexing cannot or should not work in fixed income in the way that it does in equities. We would agree that bonds are different, but would also argue that the very nature of the bond market is exactly why indexing is so valuable.

Indexing effectively transforms a highly fragmented and discontinuously liquid bond market by aggregating it, standardizing it, and making it more transparent. This standardization and transparency create cost effective, actionable exposures that make fixed income portfolio construction and management far more efficient.

In the following pages, we address the common **myths** and provide the **facts** about fixed income indexing and ETFs.

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Myth

Fixed income indices assign the largest weights to the most indebted issuers, which are the riskiest.

Fact

The largest weights in fixed income indices tend to be large, blue chip companies similar to equity indices.

The largest issuer in the bond market is the U.S. government, which continues to be viewed as having remote default risk.

In the corporate bond market, larger companies tend to be the largest issuers. However, they also have generally had the largest asset bases and revenues to service that debt. Moreover, larger companies may be healthier on average than smaller companies.

In fact, many of the companies held by fixed income indexes are very familiar to equity investors. For example, 9 of the top 10 issuers in the **iShares iBoxx $ Investment Grade Corporate Bond ETF (LQD)** are also in the S&P 500, with only Anheuser-Busch Inbev not included because it is not a U.S. listed equity security. All 10 of the top issuers have greater than $100 billion in equity market capitalization.[1]

Finally, many market capitalization indices cap issuer exposure at a certain level (e.g. 3%) or exclude higher risk countries or sectors, which limits concentration risk.

Fig. 1: Largest issuers by market cap in LQD

	Largest Issuers	Ticker	% of the ETF	Issuer Rating	Company Equity Rank in S&P 500
1	JP Morgan Chase & Co	JPM	3.05%	A-	7
2	AT&T Inc	T	2.99%	BBB+	13
3	Verizon Communications Inc	VZ	2.83%	BBB+	18
4	Bank of America Corp	BAC	2.80%	A-	11
5	Goldman Sachs Group Inc	GS	2.79%	A-	56
6	Wells Fargo & Co	WFC	2.54%	A	12
7	Apple Inc	AAPL	2.34%	AA+	1
8	Citigroup Inc	C	2.23%	BBB+	22
9	Anheuser-Busch Inbev	ABIBB	2.21%	A-	Not U.S. Listed
10	Morgan Stanley	MS	2.16%	A-	73

Source: BlackRock, as of 12/31/17. Holdings subject to change.

1 Source: Bloomberg, S&P, as of 12/31/17.

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Myth

Index funds are forced buyers and forced sellers of securities when they rebalance at each month end. Index funds cannot participate in the new issue markets.

Fact

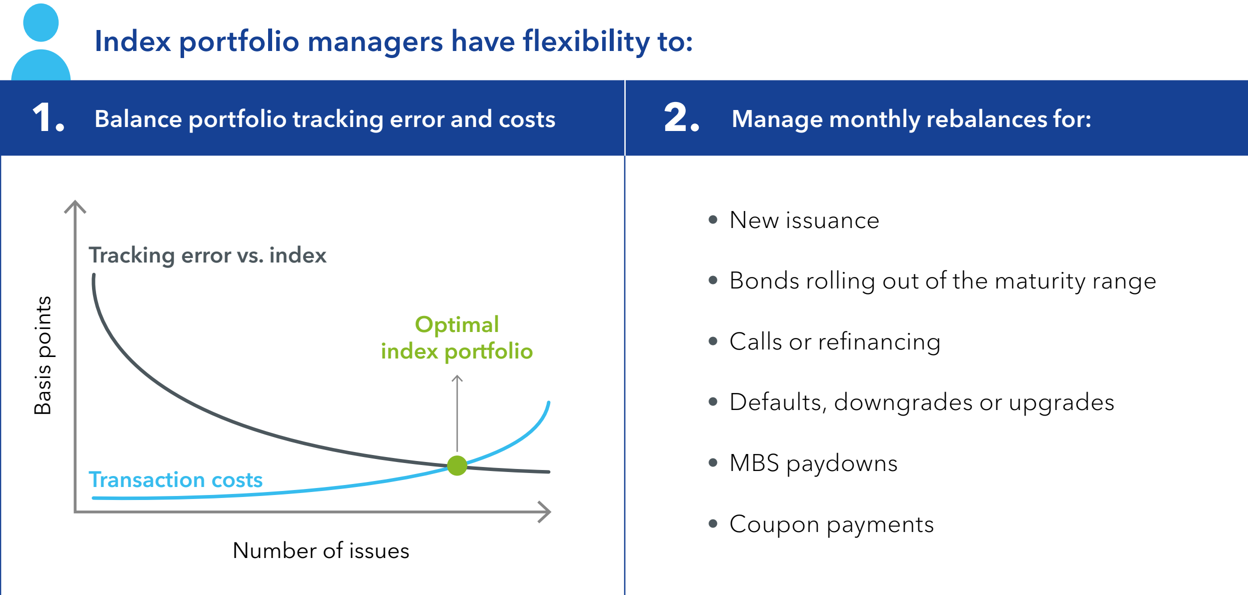
Index funds are managed by portfolio managers that employ a more flexible investment process than the benchmark they track, allowing them to avoid forced buying or selling situations and participate in the new issue market.

Most fixed income index funds are managed using a stratified sampling approach, which does not require holding every bond in the index. The investment process aims to balance tracking error, liquidity and transaction costs when selecting securities (Figure 2). Moreover, BlackRock continually evolves our portfolios throughout the month as opposed to rebalancing on a single day at month end.

Importantly, because we methodically sample bond indices as opposed to fully replicating them, we have the flexibility to avoid being forced into transactions either in terms of timing or price. Rebalancing trades are executed with the benefit of our investors in mind.

iShares bond ETFs can and do participate in the new issue market when it is to the benefit of our investors. The portfolio manager will participate in a new bond issue if they believe that the new issue price concession outweighs the potential tracking error created by owning it prior to its official inclusion in the index at the next rebalance.

Fig. 2: A flexible process helps index managers avoid potential pitfalls



Source: BlackRock. For illustrative purposes only

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Myth

Fixed income index funds are forced to incur transaction costs by trading excessively to match their reference benchmarks. High turnover costs lead to underperformance relative to actively managed funds, which have more "flexibility".

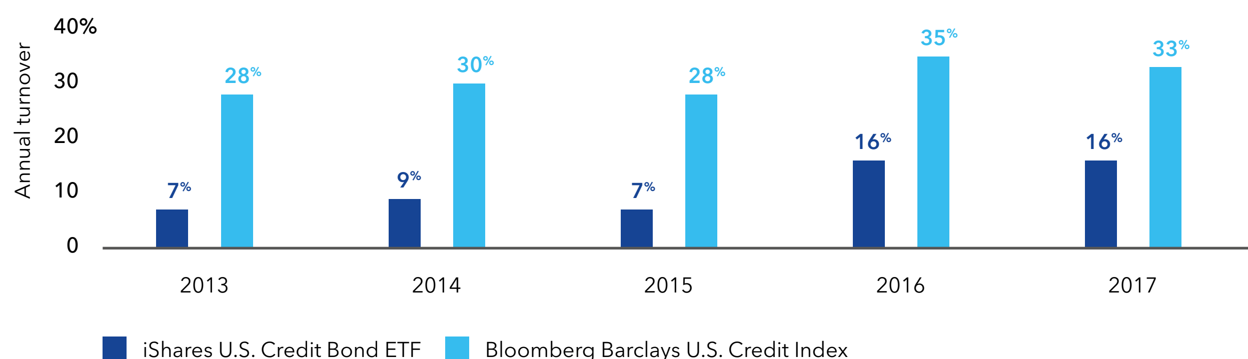
Fact

Typically, index funds have had lower turnover than both their underlying index and active managers in their category.

The evidence does not support the claim that index funds have higher turnover. For example, **iShares iBoxx $ High Yield Corporate Bond ETF (HYG)** had turnover of 13% for the fiscal year ended 2/28/17.[2] For reference, the average annual turnover among actively managed strategies in the Morningstar U.S. High Yield Bond Fund Category was 82%.[3] Additionally, HYG's annual return since inception has been within 48 bps of its index return, which is 2 bps less than its stated expense ratio of 50 bps.[4]

Using a thoughtful, methodical sampling approach allows us to meaningfully reduce turnover in our portfolios. As an example, Bloomberg Barclays U.S. Credit Index has average turnover of approximately 31% vs. 11% for the ETF tracking it over the past 5 years (Figure 3).

Fig. 3: Annual turnover of an ETF and its index



Source: Bloomberg, Morningstar, as of 12/31/17.

2 BlackRock, as reported in the 2017 annual report.

3 Morningstar Direct, based on the average turnover of 199 funds in the U.S. High Yield Bond Fund Category, as of 9/30/17.

4 Performance is since fund inception from 7/2/07 to 12/31/17. **Past performance does not guarantee future results. For standardized performance, see the end of the document.** .

Myth

Fixed income indices by definition cannot be flexible or nimble, resulting in lost tactical opportunities and underperformance in adverse market conditions.

Fact

An investor can use multiple indexed investments, such as ETFs, to build custom portfolios to meet their unique investment needs be it downside protection or seeking alpha.

The broadening range of fixed income indices, and the index funds and ETFs referencing them affords investors an increasing degree of precision. Investors may choose among broad multi-sector exposures or specific segments of the market such as investment grade corporates, high yield or emerging market debt. Investors have much greater control over their duration and asset/sector allocation. Portfolio composition can typically be adjusted rapidly and efficiently to seek out opportunities in the market.

Additionally, just because a fund is "active" does not necessarily mean it will be able to offer protection during a market downturn. For example, during the 2008 financial crisis, the average active manager underperformed indices across the multi-sector, intermediate-term bond, ultrashort and short-term bond categories (Figure 4).

When trying to outperform a benchmark, many managers have historically held bonds with more risk than the index and tended to hold more concentrated positions. In the investment grade corporate bond category, on average managers have held lower credit quality securities (8.2% in BB or lower) than an investment grade only ETF such as the **iShares iBoxx $ Investment Grade Corporate Bond ETF (LQD)** (Figure 5).

Fixed income index exposures are highly diversified and often exhibit less concentration risk than their active counterparts. As an example, LQD holds over 1,800 positions with the largest position comprising less than 1% of the NAV. By comparison, the 10 largest actively managed corporate bond mutual funds held an average of approximately 550 positions.[5]

5 Source: Morningstar, as of 12/31/17. Based on the Morningstar US Corporate Bond Category.

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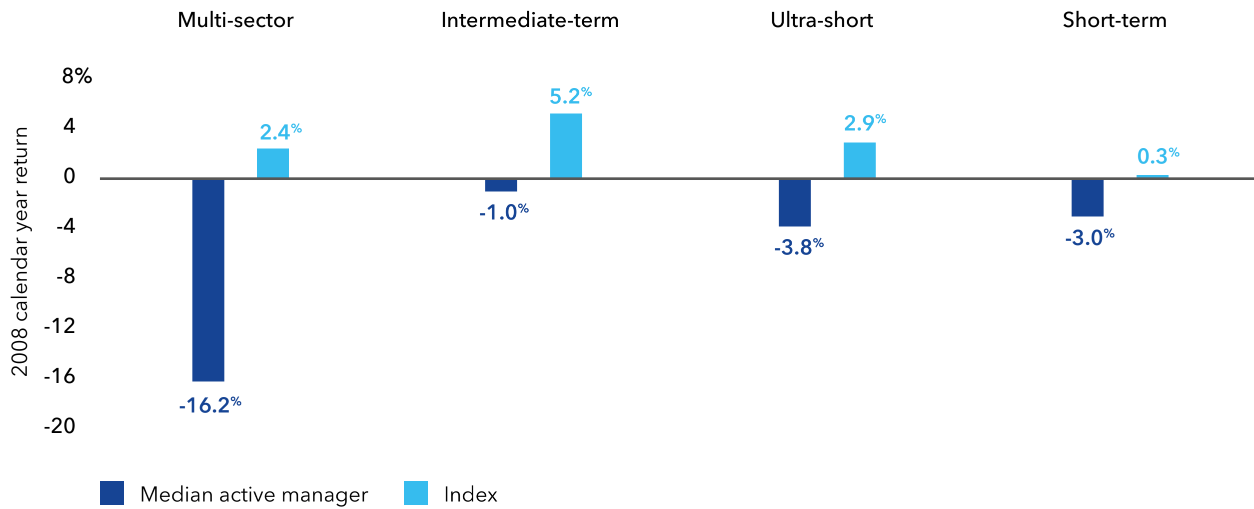
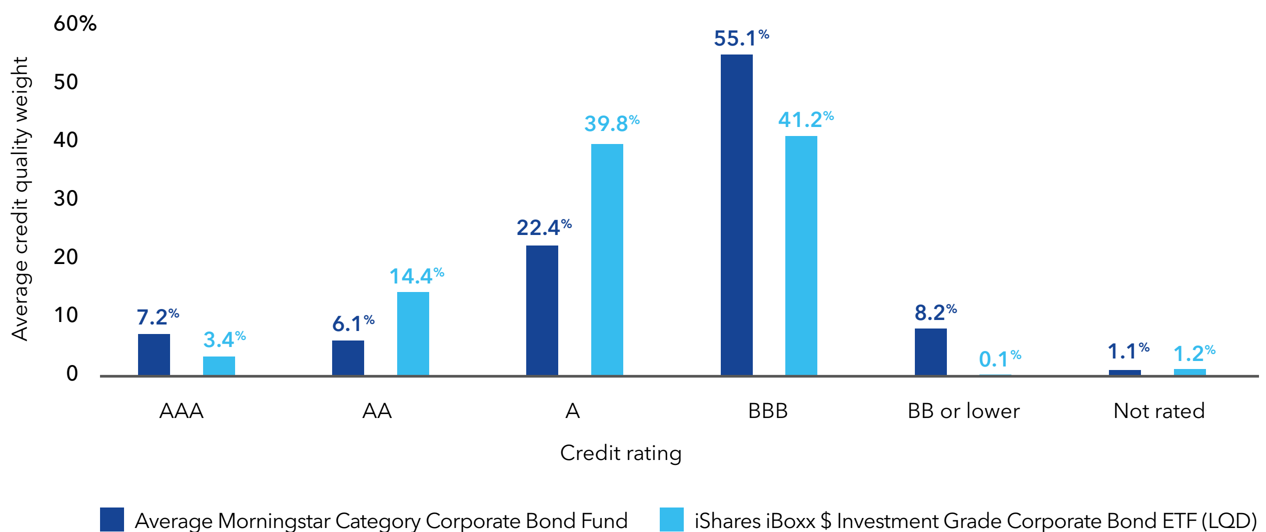
Fig. 4: 2008 Performance of median active manager in Morningstar bond categories vs. index return



Source: Morningstar, for calendar year 2008. "Multi-sector" index represented by the Bloomberg Barclays US Universal Index. "Intermediate-term" index represented by the Bloomberg Barclays US Aggregate Index. "Ultra-short" index represented by the ICE US Treasury Short Bond Index. "Short-term" index represented by the Bloomberg Barclays 1-3 Yr Credit Index. **Index performance is for illustrative purposes only. Index performance does not reflect any management fees, transaction costs or expenses. Indexes are unmanaged and one cannot invest directly in an index. Past performance does not guarantee future results.**

Fig. 5: Credit quality breakout of LQD vs. active corporate bond manager category



Source: Morningstar, as of 12/31/17. The credit quality of a particular security or group of securities may be based upon a rating from a nationally recognized statistical rating organization or, if unrated by a ratings organization, assigned an internal rating by BlackRock, neither of which ensures the stability or safety of an overall portfolio. Credit quality ratings on underlying securities of the fund are received from S&P, Moody's and Fitch and converted to the equivalent S&P major rating category. This breakdown is provided by BlackRock and takes the median rating of the three agencies when all three agencies rate a security the lower of the two ratings if only two agencies rate a security and one rating if that is all that is provided. Unrated securities do not necessarily indicate low quality. Below investment-grade is represented by a rating of BB and below. Ratings and portfolio credit quality may change over time.

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Myth

Fixed income is too broad of an asset class, with too many bonds to index effectively.

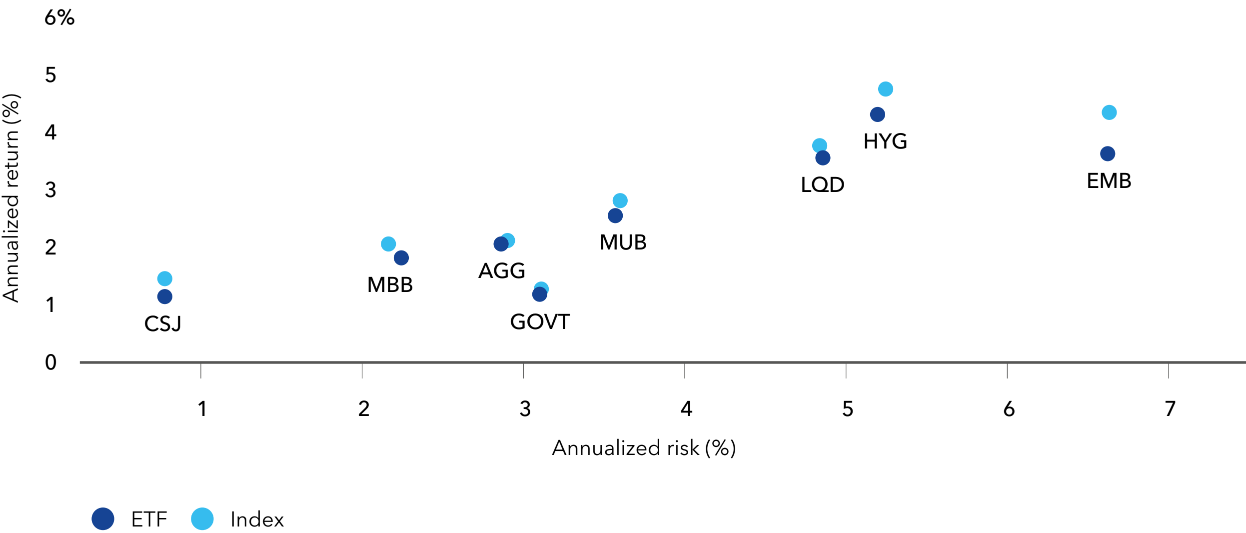
Fact

ETFs have demonstrated the ability to replicate the risk and return characteristics of their benchmarks across a diverse set of fixed income sectors.

iShares bond ETFs have demonstrated robust tracking to fixed income benchmarks despite the fragmentation and discontinuous liquidity of the market (Figure 6). Thoughtful, risk-aware portfolio management through sampling and optimization techniques enables our portfolio managers to replicate index exposure with fewer bonds than the benchmark.

At inception, bond ETFs tend to have lower AUM and may hold fewer securities compared to its index. As an example, the **iShares Core Total USD Bond Market ETF (IUSB)**, which was launched in June 2014, held 2% of its benchmark initially. Over time, the assets grew and the fund increased holdings leading to a reduction in tracking error. Even with an allocation of only 30% of the bonds in the index, IUSB exhibited a tracking error of less than 0.1% annualized.[6]

Fig. 6: 5-year risk and return of iShares bond ETFs and their underlying indices



Source: Morningstar, as of 12/31/17. Risk is represented by standard deviation which measures how dispersed returns are around the average. A higher standard deviation indicates that returns are spread out over a larger range of values and thus, more volatile. **The performance quoted represents past performance and does not guarantee future results. Investment return and principal value of an investment will fluctuate so that an investor's shares, when sold or redeemed, may be worth more or less than the original cost. Current performance may be lower or higher than the performance quoted. For standardized performance, see the end of this document.**

6 Source: BlackRock Solutions, as of 12/31/17.

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Myth

Index investors and non-economic investors make suboptimal investment decisions and create numerous market distortions.

Fact

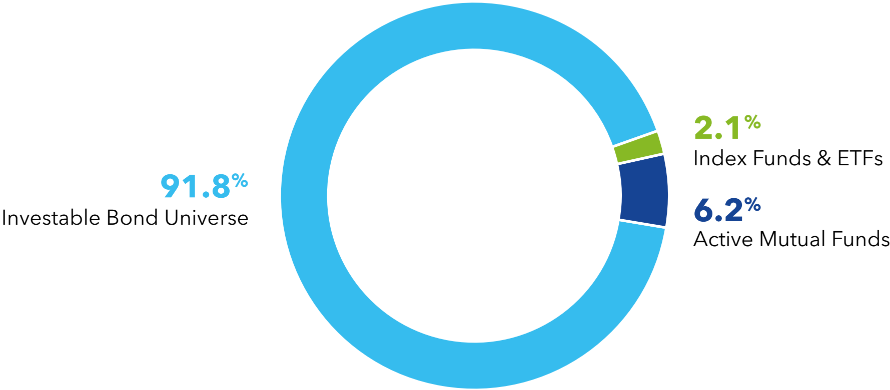
Beliefs that indexing is creating inefficiently priced markets are misplaced as index investments account for only about 2% of the market.

About 2% of the total bond market is held in indexed-based investments, with less than 1% in ETFs. Conversely, over 6% of the bond market is in actively managed mutual funds, or more than three times indexed (Figure 7).

The remaining 92% of bonds are bought and sold individually and are not held in an index fund, ETF, or mutual fund structure.

If most assets were in index funds, indexing could potentially degrade price discovery over time. However, the opportunities that this degree of indexing would present to active managers would likely result in an equilibrium between active and index exposures being reached long before an indexing saturation point.

Fig. 7: Index and active assets as a percent of the investable bond universe



Source: Morningstar, Bloomberg. "Investable Bond Universe" based on the Bloomberg Barclays Multiverse Index which represents $53.2 trillion in bond securities. "Index Funds and ETFs" based on funds in the Morningstar passive category which represented $1.2 trillion in assets. "Active Mutual Funds" based on the Morningstar active category which represented $3.3 trillion in assets.

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Myth

Active fixed income managers consistently beat their benchmarks and passive strategies over time and do so by exploiting inefficiencies in the bond market.

Fact

Many active funds have relied on investments in higher risk sectors to outperform a benchmark in upward trending markets, which can reverse when markets are downward trending.

Most active managers in the Intermediate-term bond category, benchmark against the Bloomberg Barclays U.S. Aggregate Index, which is mainly comprised of very high quality securities such as U.S. Treasuries and Agency MBS. However, these managers tend to hold out-of-benchmark tilts to sectors such as high yield, emerging markets or lower quality securitized or structured investments.[7] As yield is an important component in total return, these higher yielding tilts provide a means to outperform a high quality, low yielding benchmark such as the U.S. Aggregate, but they can also increase the correlation with equity investments (Figure 8).

The composition of the Bloomberg Barclays U.S. Universal Bond Index is much closer to the typical intermediate active strategy than the Aggregate. There is a significant reduction in the number of active strategies that outperform the Universal vs. the Aggregate index (Figure 9), validating the point that out-of-benchmark tilts have been significant drivers of excess returns.

Additionally, many ETFs track more liquid bond indices, which tend to have less yield and, accordingly, tend to underperform the broader benchmarks. As an example, the yield of the Markit iBoxx USD Liquid High Yield Index, the reference benchmark for **iShares iBoxx $ High Yield Corporate Bond ETF (HYG),** was approximately 50 bps lower than the broader and less liquid Bloomberg Barclays U.S. Corporate High Yield Bond Index.[8]

In general, we would expect an index exposure to deliver the "market return" which should reside near the median of active manager performance. However, index exposures have performed reasonably well relative to the universe of active strategies, particularly after adjusting for fees. As an example, within specific sectors such as investment grade, high yield, and emerging markets, certain bond ETFs have tended to be above median or even in the top quartile of performance in their respective Morningstar categories (Figure 10).

7 Source: Morningstar, based on average fund holdings as of 12/31/17.
8 Source: Bloomberg Barclays Indices.

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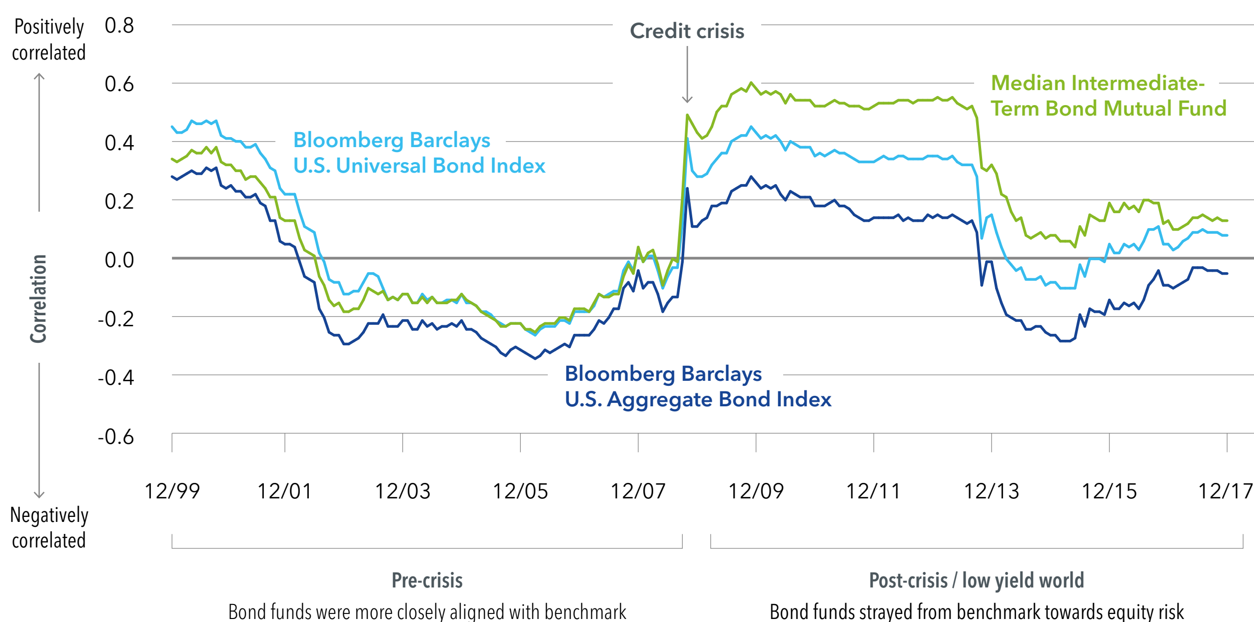
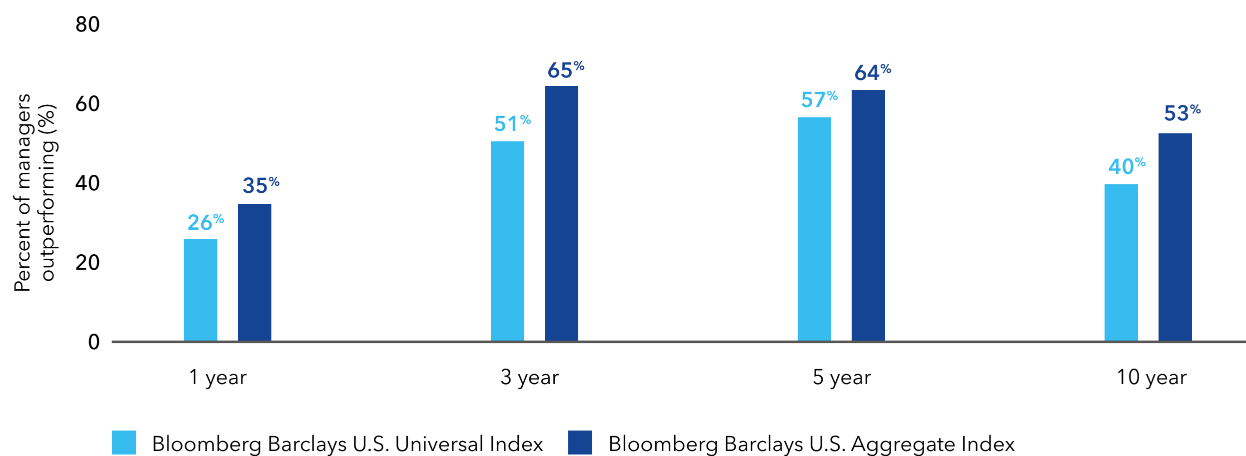
Fig. 8: Bond manager and index correlations with S&P 500 Index



Source: Morningstar as of 12/31/17. Time period measured from 1/1/00 – 12/31/17. Correlation measures how two securities move in relation to each other. Correlation ranges between +1 and -1. A correlation of +1 indicates returns moved in tandem, -1 indicates returns moved in opposite directions, and 0 indicates no correlation. Past correlations not indicative of future correlations.

Fig. 9: Percentage of funds that outperformed the Aggregate vs. Universal indices



Source: Morningstar, as of 12/31/17. Based on manager returns of the Intermediate-term bond fund category. **Past performance does not guarantee future results.**

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Fig. 10: Bond ETF category percentile rankings

Ticker	ETF name	U.S. fund category	1yr	3yr	5yr	10yr
AGG	iShares Core U.S. Aggregate Bond ETF	Intermediate Term Bond	40%	57%	61%	46%
IUSB	iShares Core Total USD Bond Market ETF	Intermediate Term Bond	33%	38%	-	-
MUB	iShares National Muni Bond ETF	Muni National Intermediate	29%	45%	45%	28%
TIP	iShares TIPS Bond ETF	Inflation Protected Bond	24%	10%	27%	13%
LQD	iShares iBoxx $ Investment Grade Corporate Bond ETF	Corporate Bond	14%	15%	25%	10%
MBB	iShares MBS ETF	Intermediate Government	46%	62%	60%	50%
EMB	iShares J.P. Morgan USD Emerging Markets Bond ETF	Emerging Market Bond	28%	24%	32%	22%
HYG	iShares iBoxx $ High Yield Corporate Bond ETF	High Yield Bond	41%	54%	58%	61%

Source: Morningstar, as of 12/31/17. Based on after-tax returns. **Past performance does not guarantee future results.**

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Conclusion

The highly fragmented and discontinuously liquid nature of the bond market has led to claims that fixed income indexing cannot work and that active management is the only solution. We argue that it is the very nature of fixed income that makes indexing not only necessary but valuable for all styles of investing. Indexing transforms the fragmented bond market into standardized, predictable and efficient exposures that greatly simplify portfolio construction.

Many of the myths surrounding fixed income indexing strategies such as high turnover, forced buying/selling and poor performance relative to stated benchmarks and active strategies are simply not true. Often, performance differences can be due to benchmark selection, erroneous benchmark comparisons within sectors and out of benchmark structural tilts. In reality, many index-based investments like ETFs have generated returns that are very competitive with active funds in their category.

The broadening range of fixed income indices, index funds and ETFs affords investors an increasing degree of precision. Portfolio composition can be adjusted rapidly and efficiently to seek opportunities without having to trade multiple bonds. Index funds and ETFs can be used to cost-effectively scale portfolios, enabling portfolio managers to focus on higher conviction trades.

For all of these reasons, we believe that not only does fixed income indexing work, but that it will become an indispensable component for all fixed income portfolios.

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Standardized Performance as of 12/31/17

Fund name	Fund inception date	Gross expense ratio	1 year	5 year	10 year	Since inception
iShares iBoxx $ High Yield Corporate Bond ETF (HYG)	4/4/07	0.49%				
Fund NAV Total Return			6.09%	4.28%	5.96%	5.61%
Fund Market Price Total Return			6.03%	4.24%	5.76%	5.57%
Index Total Return			6.32%	4.72%	6.55%	6.08%
iShares 1-3 Year Credit Bond ETF (CSJ)	1/5/07	0.20%				
Fund NAV Total Return			1.41%	1.13%	2.42%	2.69%
Fund Market Price Total Return			1.29%	1.11%	2.38%	2.68%
Index Total Return			1.66%	1.44%	2.82%	3.09%
iShares MBS ETF (MBB)	3/13/07	0.12%				
Fund NAV Total Return			2.37%	1.80%	3.50%	3.67%
Fund Market Price Total Return			2.51%	1.83%	3.48%	3.67%
Index Total Return			2.47%	2.04%	3.84%	4.03%
iShares Core U.S. Aggregate Bond ETF (AGG)	9/22/03	0.06%				
Fund NAV Total Return			3.53%	2.05%	3.90%	4.02%
Fund Market Price Total Return			3.55%	2.06%	3.89%	4.02%
Index Total Return			3.54%	2.10%	4.01%	4.19%
iShares Core Total USD Bond Market ETF (IUSB)	6/10/14	0.07%				
Fund NAV Total Return			4.06%	-	-	2.92%
Fund Market Price Total Return			3.99%	-	-	2.96%
Index Total Return			4.09%	-	-	2.93%
iShares U.S. Treasury Bond ETF (GOVT)	2/14/12	0.15%				
Fund NAV Total Return			2.19%	1.17%	-	1.34%
Fund Market Price Total Return			2.31%	1.20%	-	1.34%
Index Total Return			2.31%	1.26%	-	1.43%

The performance quoted represents past performance and does not guarantee future results. Investment return and principal value of an investment will fluctuate so that an investor's shares, when sold or redeemed, may be worth more or less than the original cost. Current performance may be lower or higher than the performance quoted. Performance data current to the most recent month end may be obtained by visiting www.iShares.com or www.blackrock.com. Shares of ETFs are bought and sold at market price (not NAV) and are not individually redeemed from the Fund. Brokerage commissions will reduce returns. Market returns are based upon the midpoint of the bid/ask spread at 4:00 p.m. eastern time (when NAV is normally determined for most ETFs), and do not represent the returns you would receive if you traded shares at other times.

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Fund name	Fund inception date	Gross expense ratio	1 year	5 year	10 year	Since inception
iShares National Muni Bond ETF (MUB)	9/7/07	0.25%				
Fund NAV Total Return			4.61%	2.53%	4.00%	4.03%
Fund Market Price Total Return			4.68%	2.56%	3.90%	4.04%
Index Total Return			5.09%	2.79%	4.22%	4.21%
iShares iBoxx $ Investment Grade Corporate Bond ETF (LQD)	7/22/02	0.15%				
Fund NAV Total Return			7.16%	3.53%	5.84%	5.67%
Fund Market Price Total Return			7.00%	3.54%	5.78%	5.66%
Index Total Return			7.29%	3.74%	6.21%	5.93%
iShares J.P. Morgan USD Emerging Markets Bond ETF (EMB)	12/17/07	0.39%				
Fund NAV Total Return			9.98%	3.60%	6.53%	6.57%
Fund Market Price Total Return			10.26%	3.55%	6.50%	6.59%
Index Total Return			10.46%	4.31%	7.29%	7.33%

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Investing involves risk, including possible loss of principal.

Fixed income risks include interest-rate and credit risk. Typically, when interest rates rise, there is a corresponding decline in bond values. Credit risk refers to the possibility that the bond issuer will not be able to make principal and interest payments. Non-investment-grade debt securities (high-yield/junk bonds) may be subject to greater market fluctuations, risk of default or loss of income and principal than higher-rated securities.

There may be less information on the financial condition of municipal issuers than for public corporations. The market for municipal bonds may be less liquid than for taxable bonds. Some investors may be subject to federal or state income taxes or the Alternative Minimum Tax (AMT). Capital gains distributions, if any, are taxable. Mortgage-backed securities ("MBS") and commercial mortgage-backed securities ("CMBS") are subject to prepayment and extension risk and therefore react differently to changes in interest rates than other bonds. Small movements in interest rates may quickly and significantly reduce the value of certain mortgage-backed securities.

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