

Index your bonds

A guide to dispelling
the myths

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. 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.

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.

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.

When it comes to bond indexing, larger debt issuance does not inherently reflect higher issuer risk. 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.

Many of the companies held by fixed income indices are very familiar to equity investors. For example, the top weights in the widely followed corporate bond benchmark, Markit iBoxx USD Liquid Investment Grade Index, are large, blue chip companies like JP Morgan Chase, AT&T, and Verizon. In fact, the top 10 issuers in the index are also in the top 100 holdings of the S&P 500 Index and have stock market capitalizations over \$100 billion.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 in Markit iBoxx USD Liquid Investment Grade Index

	Largest Issuers	Ticker	Index Weight	Equity Rank in S&P 500
1	AT&T Inc	T	3.00%	13
2	JP Morgan Chase & Co	JPM	2.97%	7
3	Verizon Communications Inc	VZ	2.82%	18
4	Goldman Sachs Group Inc/The	GS	2.76%	56
5	Bank of America Corp	BAC	2.41%	11
6	Apple Inc	AAPL	2.41%	1
7	Wells Fargo & Company	WFC	2.30%	12
8	Citigroup Inc	C	2.27%	22
9	Microsoft Corporation	MSFT	2.23%	2
10	Morgan Stanley	MS	2.22%	73

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

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

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

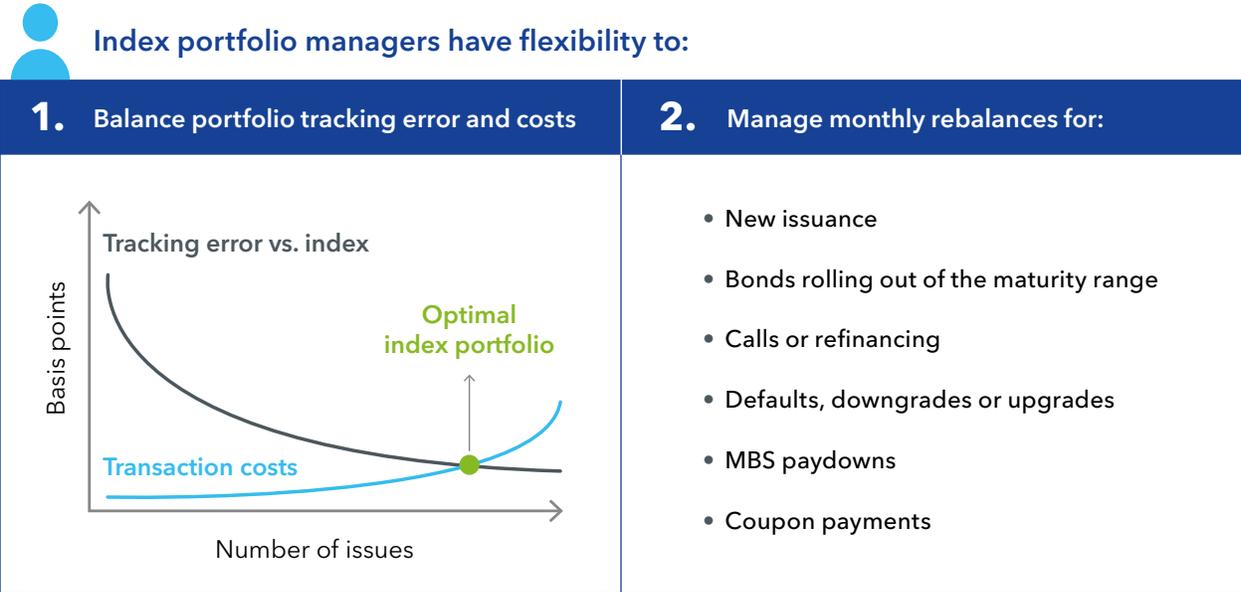
Index funds are managed by portfolio managers that employ a more flexible investment process than the benchmark they track, allowing them to avoid forced buying or selling situations and participate in the new issue market.

Most fixed income index funds and bond ETFs 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

Myth

Bond index funds and ETFs are forced to incur transaction costs by trading excessively to match their benchmarks. High turnover costs lead to underperformance relative to active strategies which have more “flexibility.”

Fact

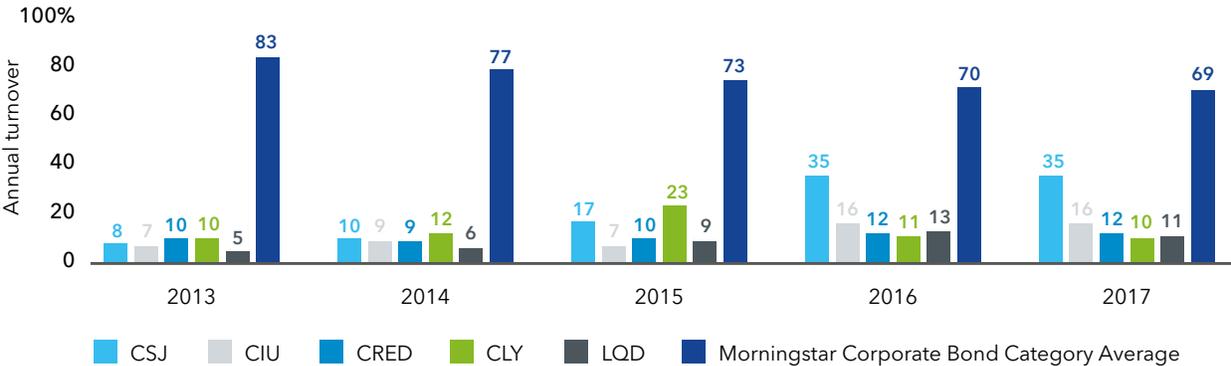
Generally, iShares bond ETFs are managed to limit transaction costs which can result in lower turnover relative to similar active strategies.

The cash flows generated in fixed income portfolios inherently contribute to higher turnover relative to equity funds. Maturities, coupon cash flows, calls, new issues, and downgrades all contribute to bond index turnover.

However, turnover is not always a good proxy for transaction costs, particularly in ETFs. Fund turnover is typically calculated as the lesser of purchases or sales of securities over a fiscal year divided by the monthly average of portfolio value. The rolling of any derivative contracts would also be included. The turnover metric does not include any in-kind creation or redemption activity by the ETF. By utilizing the in-kind exchange of bonds for ETF shares, the portfolio manager may be able to reduce the level of explicit purchases or sales of securities required to keep the portfolio in line with its benchmark.

A review of iShares corporate bond ETFs over a five-year period reveals a lower level of turnover on average than similar actively managed mutual funds. For example, the average turnover for five iShares corporate bond ETFs was 13% per year over the past 5 years versus an average turnover of 75% per year for actively managed corporate bond mutual funds (Figure 3).

Fig. 3: Turnover comparison of corporate bond ETFs and active managers



Source: BlackRock, Bloomberg, Morningstar, as 12/31/17. Note: The iShares 1-3 Year Credit Bond ETF (CSJ), iShares Intermediate Credit bond ETF (CIU), iShares Credit Bond ETF (CRED), and iShares 10+ Year Credit Bond ETF (CLY) were changed to the iShares Short-Term Corporate Bond ETF (IGSB), iShares Intermediate-Term Corporate Bond ETF (IGIB), iShares Broad USD Investment Grade Corporate Bond ETF (USIG), and iShares Long-Term Corporate Bond ETF (IGLB) in August 2018.

Myth

Bond indexing by definition cannot be flexible or nimble, resulting in lost tactical opportunities and underperformance in adverse market conditions.

Fact

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

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.

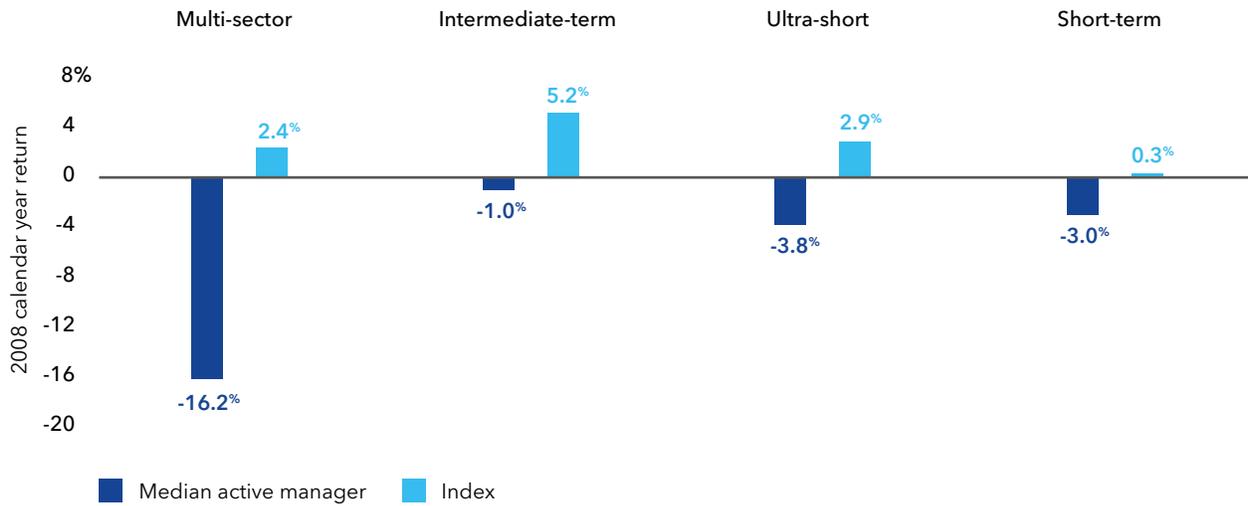
Additionally, just because a fund is “active” does not necessarily mean it will be able to offer protection during a market downturn. For example, during the 2008 financial crisis, the average active manager underperformed indices across the multi-sector, intermediate-term bond, ultrashort and short-term 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. For instance, in the Morningstar Corporate Bond Category, on average managers have held 8% exposure in BB or lower rated bonds. Conversely, investment grade bond ETFs have held 99.9% exposure in investment grade securities on average (Figure 5).

Finally, index exposures can be highly diversified and less concentrated than their active counterparts. As an example, on average there are approximately 1,700 positions in investment grade corporate bond ETFs, while the 10 largest actively managed corporate bond mutual funds held an average of approximately 550 positions.²

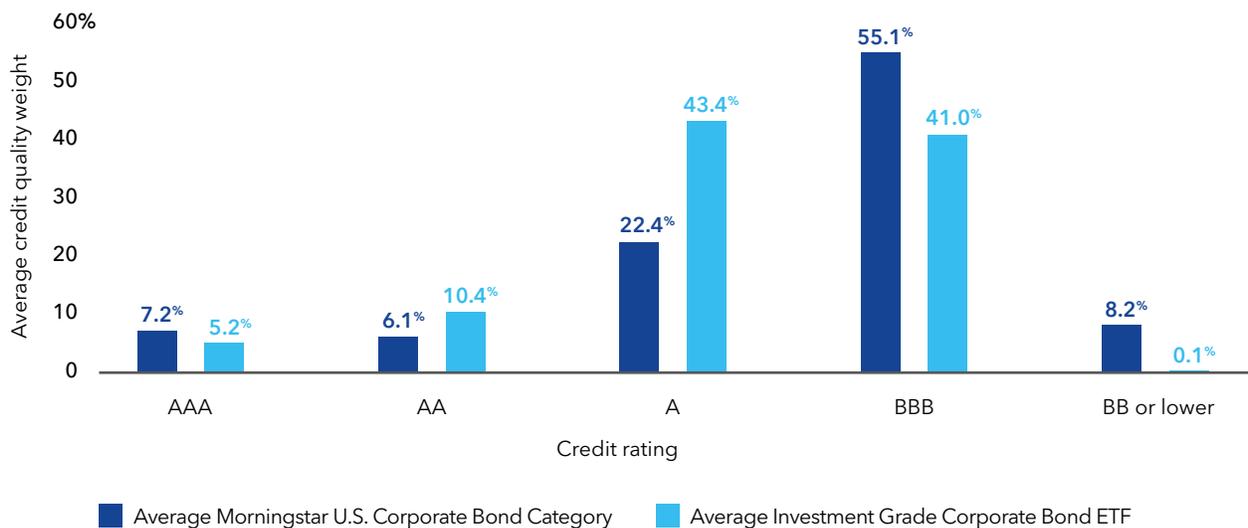
² Source: Morningstar, as of 12/31/17. Based on the Morningstar U.S. Corporate Bond Category and the 14 market-cap weighted investment grade corporate bond ETFs available in the U.S.

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 U.S. Universal Index. "Term" index represented by the Bloomberg Barclays U.S. Aggregate Index. "Ultra-short" index represented by the ICE U.S. 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 bond ETFs vs. Morningstar U.S. Corporate Bond Category



Source: Morningstar, as of 12/31/17. "Average Morningstar U.S. Corporate Bond Category" based on the average holdings of 57 funds listed in the Morningstar category. "Average investment grade corporate bond ETF" based on the average holdings of the 14 market-cap weighted investment grade corporate bond ETFs available in the U.S. 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.

Myth

Fixed income is too complicated of an asset class to index effectively.

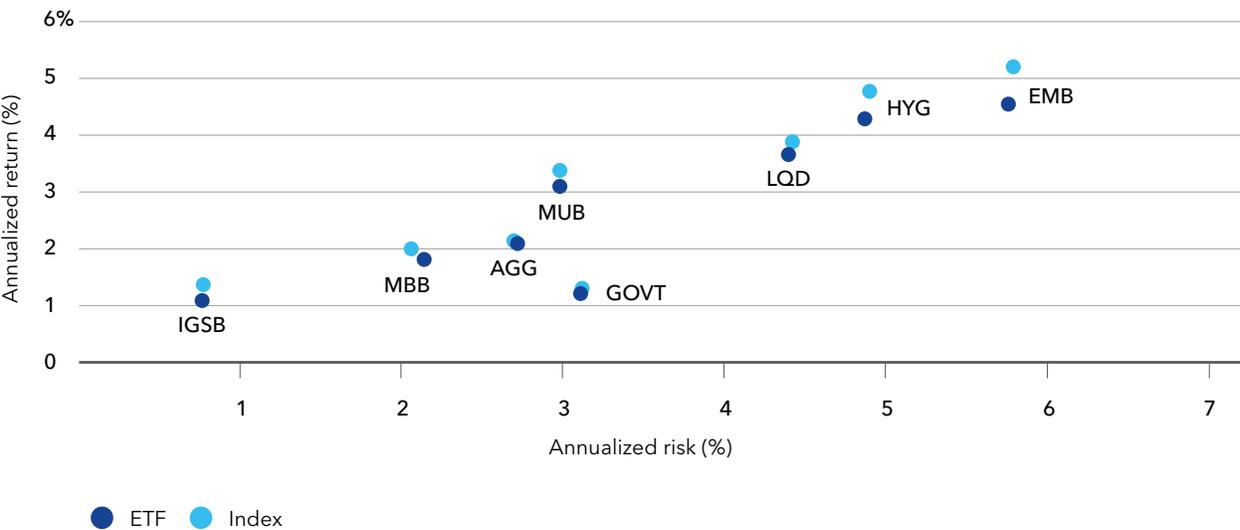
Fact

iShares bond 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. For example, at inception the **iShares Core U.S. Aggregate Bond ETF (AGG)** held only 150 bonds in its initial portfolio. Currently, it holds approximately 6,500 bonds, or two-thirds of its benchmark, the Bloomberg Barclays U.S. Aggregate Bond Index. From its inception through the end of 2017, AGG's returns have been within 1 basis point of the benchmark returns, net of fees.³

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



Source: Morningstar, as of 9/30/18. 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.**

³ Source: BlackRock Solutions, as of 6/30/18.

Myth

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

Fact

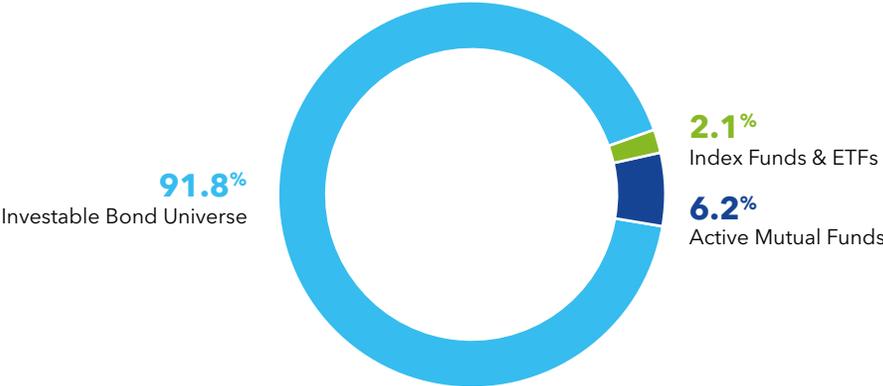
Beliefs that indexing is creating inefficiently priced markets are misplaced as index investments account for only about 2% of the market.

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 approximately 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.

Myth

Active fixed income managers consistently beat the Bloomberg Barclays U.S. Aggregate Bond Index by exploiting inefficiencies in the bond market.

Fact

Many active funds have relied on investments in higher risk sectors to outperform the Bloomberg Barclays U.S. Aggregate Bond Index, resulting in higher correlations with equities and less diversification benefits.

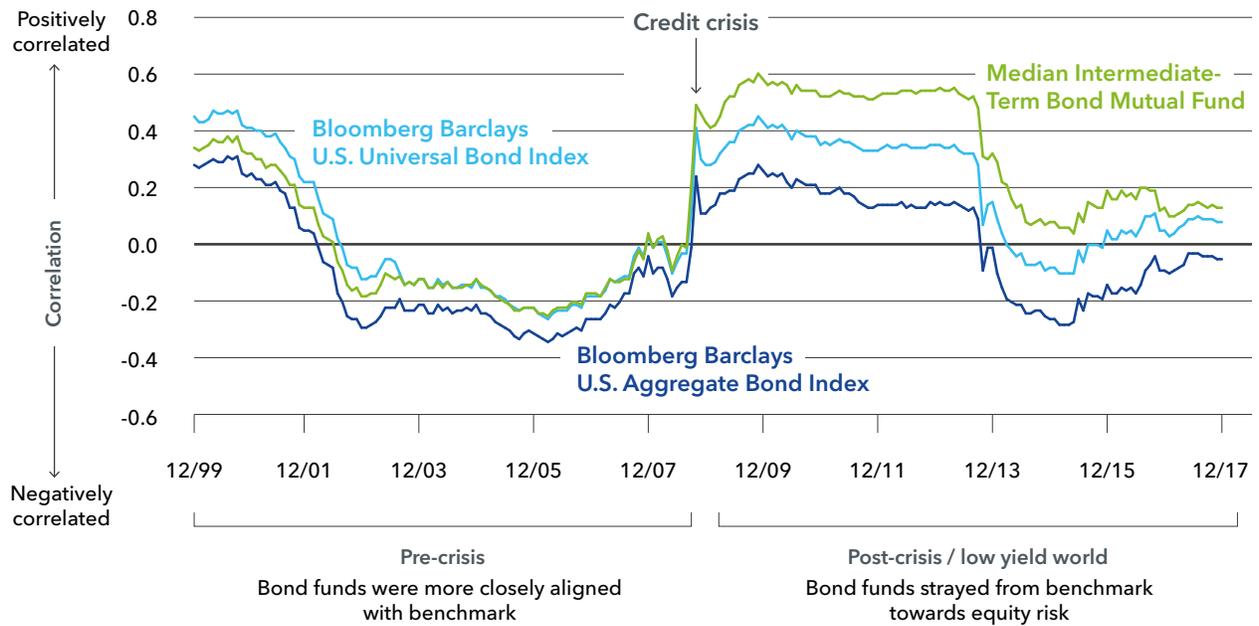
Most active managers in the Morningstar Intermediate Term Bond Category benchmark against the Bloomberg Barclays U.S. Aggregate Bond Index, which is mainly comprised of very high quality securities such as U.S. Treasuries and Agency MBS. However, these managers tend to hold out-of-benchmark tilts to sectors such as high yield, emerging markets or lower quality securitized or structured investments.⁴ 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 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 because it holds approximately 9% in non-investment grade securities. 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.

Accordingly, we believe that the Bloomberg Barclays U.S. Universal Bond Index is typically a more relevant benchmark for Intermediate Term Bond managers.

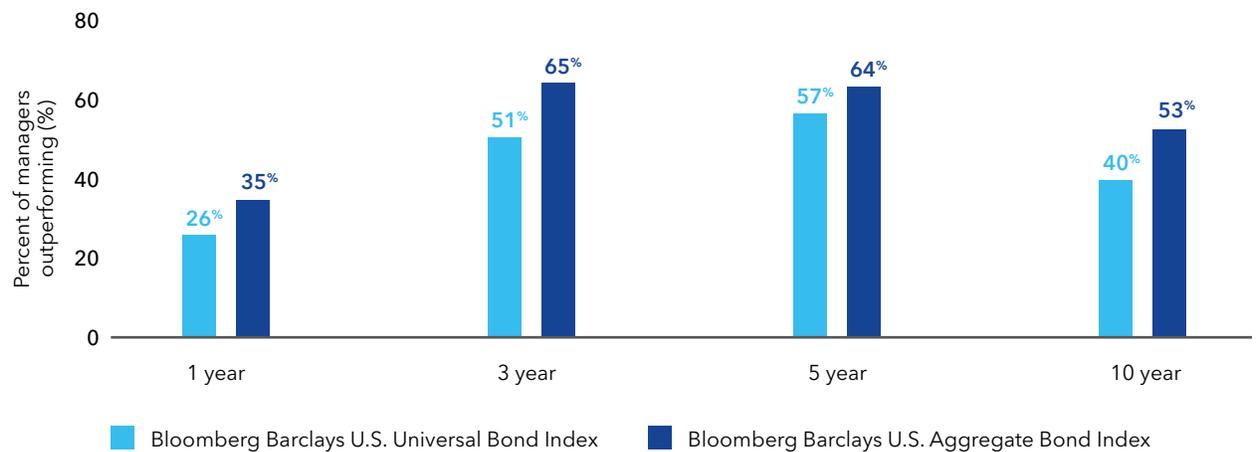
⁴ Source: Morningstar, based on average fund holdings as of 12/31/17.

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 Morningstar Intermediate Term Bond Category. **Past performance does not guarantee future results.**

Myth

Bond index strategies consistently underperform active strategies.

Fact

Various bond index strategies, like iShares bond ETFs, have outperformed their Morningstar mutual fund categories across a broad range of sectors.

Similar to equity ETFs, many bond ETFs have delivered competitive returns relative to active strategies across a variety of sectors. In general, we would expect an index exposure to deliver the “market return” which should reside near the median of active manager performance. However, many iShares Bond ETFs have performed reasonably well relative to the universe of active strategies, particularly after adjusting for fees.

As an example, within specific sectors, certain bond ETFs have tended to be above median in their respective Morningstar categories (Figure 10).

Finally, some bond ETFs track more liquid bond indices, which tend to yield less and, accordingly, may underperform broader indices over time. As an example, the yield of the Market iBoxx USD Liquid High Yield Index, the reference benchmark for the **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.⁵

Fig. 10: Bond ETF Morningstar Category percentile rankings

Ticker	ETF name	Morningstar fund category	1yr	5yr	10yr
AGG	iShares Core U.S. Aggregate Bond ETF	Intermediate Term Bond	56%	49%	74%
LQD	iShares iBoxx \$ Investment Grade Corporate Bond ETF	Corporate Bond	78%	36%	38%
MUB	iShares National Muni Bond ETF	Muni National Intermediate	53%	28%	26%
TIP	iShares TIPS Bond ETF	Inflation Protected	53%	24%	34%
EMB	iShares J.P. Morgan USD Emerging Markets Bond ETF	Emerging Market Bond	42%	22%	52%
HYG	iShares iBoxx \$ High Yield Corporate Bond ETF	High Yield Bond	44%	54%	65%

Source: Morningstar, as of 9/30/18. Based on pre-tax returns. The following number of funds were used for the 1, 5 and 10 year period percentile rankings. Intermediate Term Bond: 1039, 796, and 577 funds. Corporate Bond: 246, 152, 82 funds. Muni National Intermediate: 294, 224, 146 funds. Inflation Protected Bond: 236, 174, 107 funds. Emerging Market Bond: 287, 165, 51 funds. High Yield Bond: 692, 502, 331 funds. **Past performance does not guarantee future results.**

⁵ Source: Bloomberg Barclays Indices, Markit iBoxx, as of 12/31/17.

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.

Standardized Performance as of 9/30/18

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			2.55%	4.29%	7.34%	5.46%
Fund Market Price Total Return			2.47%	4.30%	7.49%	5.43%
Index Total Return			2.94%	4.79%	7.95%	5.93%
iShares Short-Term Corporate Bond ETF (IGSB)	1/5/07	0.06%				
Fund NAV Total Return			0.45%	1.12%	2.61%	2.57%
Fund Market Price Total Return			0.40%	1.09%	2.54%	2.56%
Index Total Return			0.68%	1.39%	3.03%	2.96%
iShares MBS ETF (MBB)	3/13/07	0.12%				
Fund NAV Total Return			-1.15%	1.82%	3.03%	3.32%
Fund Market Price Total Return			-1.14%	1.81%	3.03%	3.32%
Index Total Return			-0.92%	2.02%	3.33%	3.66%
iShares Core U.S. Aggregate Bond ETF (AGG)	9/22/03	0.06%				
Fund NAV Total Return			-1.29%	2.12%	3.66%	3.70%
Fund Market Price Total Return			-1.35%	2.11%	3.67%	3.70%
Index Total Return			-1.22%	2.16%	3.77%	3.86%
iShares Core Total USD Bond Market ETF (IUSB)	6/10/14	0.07%				
Fund NAV Total Return			-1.12%	--	--	2.05%
Fund Market Price Total Return			-1.09%	--	--	2.09%
Index Total Return			-1.00%	--	--	2.07%
iShares U.S. Treasury Bond ETF (GOVT)	2/14/12	0.15%				
Fund NAV Total Return			-1.76%	1.24%	--	0.92%
Fund Market Price Total Return			-1.72%	1.24%	--	0.93%
Index Total Return			-1.62%	1.33%	--	1.01%

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.

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	2.60%				
Fund NAV Total Return			-0.22%	3.11%	4.30%	3.68%
Fund Market Price Total Return			-0.27%	3.19%	4.08%	3.68%
Index Total Return			0.08%	3.41%	4.59%	3.87%
iShares iBoxx \$ Investment Grade Corporate Bond ETF (LQD)	7/22/02	4.13%				
Fund NAV Total Return			-1.94%	3.68%	6.44%	5.19%
Fund Market Price Total Return			-2.00%	3.68%	6.84%	5.18%
Index Total Return			-1.85%	3.89%	6.76%	5.44%
iShares J.P. Morgan USD Emerging Markets Bond ETF (EMB)	12/17/07	5.57%				
Fund NAV Total Return			-2.99%	4.56%	6.79%	5.69%
Fund Market Price Total Return			-3.21%	4.48%	6.66%	5.68%
Index Total Return			-2.49%	5.21%	7.54%	6.44%

Carefully consider the Funds' investment objectives, risk factors, and charges and expenses before investing. This and other information can be found in the Funds' prospectuses or, if available, the summary prospectuses which may be obtained by visiting www.iShares.com or www.blackrock.com. Read the prospectus carefully before investing.

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.

International investing involves risks, including risks related to foreign currency, limited liquidity, less government regulation and the possibility of substantial volatility due to adverse political, economic or other developments. These risks often are heightened for investments in emerging/developing markets and in concentrations of single countries.

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