Fixed Income ETFs

Fact vs. Fiction

STATE STREET GLOBAL ADVISORS

SPDR®

State Street Global Advisors
A Leader in Fixed Income Index Investing

The Scale to Specialize

- State Street Global Advisors' global scale enables our portfolio managers, traders and investment strategists to be sector specialists and based in their geographic markets.
- Our dedicated Capital Markets teams provide 24-hour coverage across global markets, offering enhanced liquidity and cost-efficient* trading strategies.
- Entrusted with $353 billion in fixed income assets, managing 30+ currencies across 40 different countries.**

Proven Track Record

- 22 years of bond index investing — our first fixed income index fund launched in 1996.
- Manage more than 90 individual fixed income index strategies, providing choice for investors.
- More than 100 fixed income professionals dedicated to conducting research, managing risks and costs, and supporting our clients.

Innovative Solutions for Bond Investors

- Comprehensive range of cost-effective* ETFs.
- Offering access to government and corporate bonds across the yield curve, using a consistent index methodology.

$336 bn

in fixed income assets

22 Years

of bond index investing

90+

individual fixed income index strategies

* Frequent trading of ETFs could significantly increase commissions and other costs such that they may offset any savings from low fees or costs.

** Source: State Street Global Advisors, as of 30 June 2018.

Content

Fiction #1

The fixed income ETF market has become so large that it distorts the bond market.

Relative Market Sizes

Fact

Despite their rapid growth, fixed income ETFs still only represent 1.5% of the total investable fixed income universe and 3.3% of the US high yield market.

The fixed income ETF market is still relatively young — the first fixed income ETF launched in 2002. Only 10 years ago, assets under management in fixed income ETFs represented $48 billion and circa 1.9% of the global fixed income fund industry, according to Morningstar. Meanwhile, ETFs accounted for a mere 0.2% of the investable global fixed income universe as measured by the Bloomberg Barclays Multiverse Index, which includes investment grade and high yield bonds issued in developed and emerging market currencies.

At 30 June 2018, fixed income ETFs represented 10.2% of the global fund market with $800 billion in assets. While the growth of these instruments has been robust, they still 'only' account for 1.5% of the total investable fixed income universe. Flows have been strong but they have not occurred solely at the expense of other types of existing investment vehicles. They have grown the overall market.

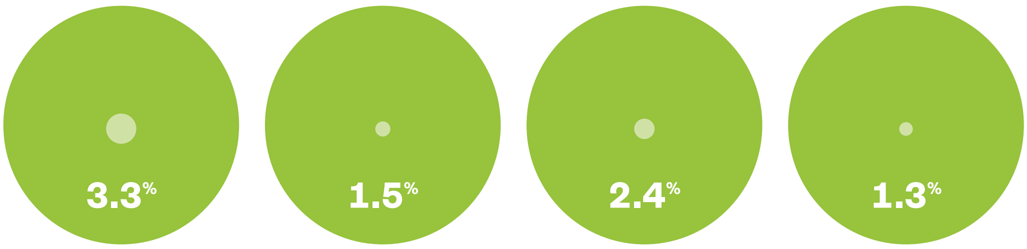
When it comes to their impact on market prices, these instruments still represent a relatively small portion of sub-asset classes within the fixed income market. Figure 1 highlights some examples of the difference between how much ETFs represent of the actual investment universe and Figure 2 shows how much they account for in terms of trading activity.

Figure 1
AUM Evolution of Fixed Income Open End Fund and ETFs Since 2007

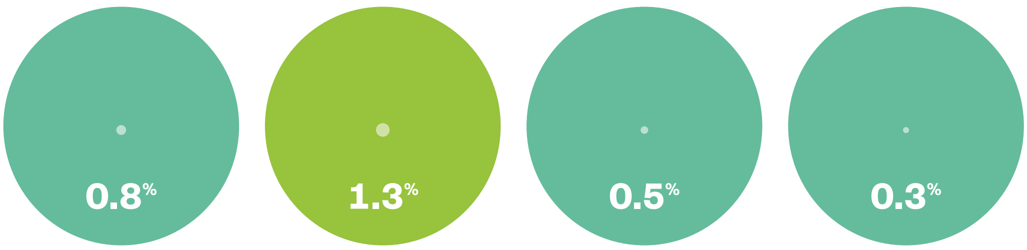
- < 1%
- 1–5%

	US High Yield Corporate Bonds	US Investment Grade Corporate Bonds	US Investment Grade Floating Rate Notes	US Senior Loans
Market Size (M)	$1,294,817	$7,531,583	$439,118	$973,825
ETFs AUM (M)	$43,067	$113,854	$10,730	$12,631

Bond Market Sizes ($M) vs. ETFs AUM ($M)



	US Municipal Bonds	EM Bonds	US Government Bonds	US MBS
Market Size (M)	$3,850,700	$1,978,569	$14,188,300	$5,634,335
ETFs AUM (M)	$30,921	$26,509	$68,194	$19,214



Market Size Data: SIFMA (as of Q4 2017; US IG Corporate Bonds, US Government Bonds, US Municipal Bonds), Bloomberg Finance L.P. (as of 29 March 2018, US High Yield Corporate Bonds), Barclays (as of 29 March 2018, US Convertibles, EM Bonds, US MBS, US IG FRNs), The Loan Syndications & Trading Association (as of 29 March 2018, US Senior Loans), S&P Dow Jones Indices (as of 29 March 2018, US Preferred Stocks). ETF AUM: Bloomberg Finance, L.P., (as of 03/29/2018). Average Daily Volume (3M ADV) Bond Trading: Bloomberg Finance, L.P. (as of 03/29/2018), EMTA (as of Q4 2017; EM Bonds), SIFMA (as of 29 March 2018, US Government Bonds, US Municipal Bonds, US MBS), S&P Dow Jones Indices (as of 29 March 2018, US Preferred Stocks). Average Daily Volume (3M ADV) ETF Trading: Bloomberg Finance, L.P. (as of 03/29/2018).

Trading Volumes

Fact

ETFs generally account for less than 5% in almost all segments of the broad USD fixed income universe.

ETFs generally account for less than 5% in almost all segments of the broad USD fixed income universe; in some cases these instruments represent a higher proportion of the traded volume. However, this is more a reflection of how the market uses these tools to invest in a highly fragmented universe representing thousands of securities. The ability to match buyers and sellers across 9,000 securities — e.g. for the US investment grade corporate bond market — is improved due to ETFs' liquidity, transparency and simplicity. This ease of use is reflected by the average daily volumes.

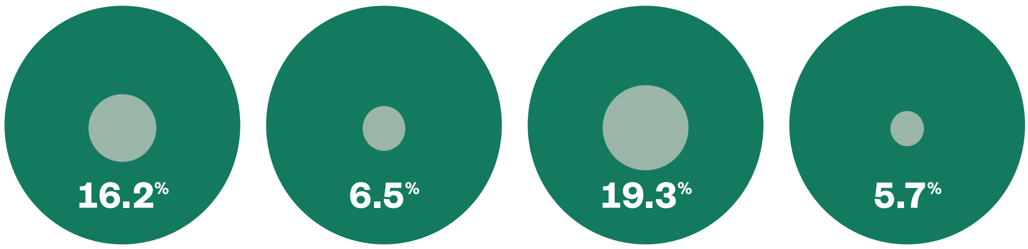
ETFs hold securities that aim to replicate the characteristics and performance behavior of the universe. As such, these portfolios are not overly concentrated and do not transact in only a limited number of securities; rather, they look to purchase or sell hundreds of bonds in smaller individual trades. In general, they are far less concentrated than actively managed funds, and their growth over the past decade has been around 16% (CAGR).

In summary, the pricing and volatility challenges of the fixed income markets should not be attributed only to ETFs, but to the change in the market structure following the Global Financial Crisis, banks deleveraging, and the overall move towards an agency model.

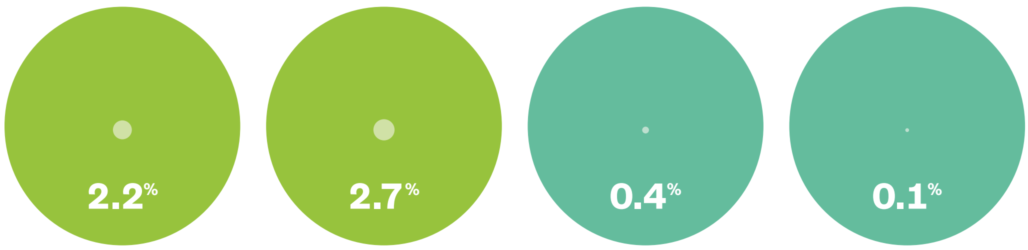
Figure 2
3-Month Average Daily Volumes: Bond Trading vs. ETF Trading

- < 1%
- 1–5%
- > 5%

	US High Yield Corporate Bonds	US Investment Grade Corporate Bonds	US Investment Grade Floating Rate Notes	US Senior Loans
3M ADV: Bond Trading (M)	$13,959	$21,970	$600	$2,690
3M ADV: ETF Trading (M)	$2,260	$1,439	$116	$141



	US Municipal Bonds	EM Bonds	US Government Bonds	US MBS
3M ADV: Bond Trading (M)	$11,300	$19,117	$572,400	$230,167
3M ADV: ETF Trading (M)	$246	$520	$2,176	$128



Market Size Data: SIFMA (as of Q4 2017; US IG Corporate Bonds, US Government Bonds, US Municipal Bonds), Bloomberg (as of 29 March 2018, US High Yield Corporate Bonds), Barclays (as of 29 March 2018, US Convertibles, EM Bonds, US MBS, US IG FRNs), The Loan Syndications & Trading Association (as of 29 March 2018, US Senior Loans), S&P Dow Jones Indices (as of 29 March 2018, US Preferred Stocks). ETF AUM: Bloomberg Finance, L.P., (as of 29 March 2018). Average Daily Volume (3M ADV) Bond Trading: Bloomberg Finance, L.P. (as of 29 March 2018), EMTA (as of Q4 2017; EM Bonds), SIFMA (as of 03/29/2018; US Government Bonds, US Municipal Bonds, US MBS), S&P Dow Jones Indices (as of 29 March 2018, US Preferred Stocks). Average Daily Volume (3M ADV) ETF Trading: Bloomberg Finance, L.P. (as of 29 March 2018).

Fiction #2

Using a fixed income ETF means the investor is overweight the most indebted — and therefore the riskiest — companies.

Fact

Indices are rules-based exposures providing a diversified slice of a segment of the corporate bond market where single company risk can potentially be mitigated.

In addition to the broad diversification afforded by indices, large issuers of debt are also companies with a substantial asset base and revenue profile. This provides the ability, or the capacity, to pay and service the debt on the firm's balance sheet. Focusing only on the amount of debt an issuer has in an index overlooks a few key variables.

Indices are rules based, focusing on diversification and liquidity for ensuring investability. As a result, not all of an issuer's debt is included in an index, which paints an incomplete picture of the firm's overall indebtedness. For instance, an issuer can have short-term liabilities that do not qualify it for inclusion in an index, or debt financing secured in subordinated form, or financing denominated in a different currency.

As shown in Figure 3, the ranking of the most indebted firms, based on the amount of debt included in the Bloomberg Barclays US Corporate Bond Index, is very different to the ranking of the firm's total short and long debt overall.

Figure 3
Top 10 Holdings in the Bloomberg Barclays US Corporate Bond Index

	JPMorgan Chase & Co	Bank of America Corp	Goldman Sachs Group Inc.	Morgan Stanley	Citigroup Inc.	AT&T Inc.	Verizon Comms	Apple Inc.	Microsoft Corp.	Wells Fargo & Company
Weight in Index (%)	2.2	2.1	1.9	1.6	1.6	1.6	1.5	1.4	1.4	1.3
Rank by Debt Included in Index	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Rank by Short-Term and Long-Term Debt	3rd	10th	15th	20th	7th	50th	65th	68th	80th	25th

Source: Bloomberg Finance L.P., as of 15 August 2018. The information contained above is for illustrative purposes only. Weights are as of the date indicated, are subject to change, and should not be relied upon as current thereafter. Diversification does not ensure a profit or guarantee against loss.

If an issuer has a high level of debt, it doesn't mean that it lacks the capacity to pay. Moreover, it doesn't mean that the company, and therefore the fixed income ETF exposure, is at risk. Firms with a high amount of debt typically also have large asset bases and revenue profiles. Otherwise, the market would not likely be willing to extend those firms any debt financing in the first place. Only focusing on the amount of debt once again paints an incomplete picture.

As shown in Figure 4, the top 10 issuers of debt within the Bloomberg Barclays US Corporate Bond Index had over $1 trillion in sales in the past year, have over $11 trillion in assets, and possess combined market value of equity of $3.7 trillion. Those figures represent 10%, 34%, and 15%, respectively, of the entire S&P 500's total figures. Quite simply these are large, profitable, and well capitalised firms. Moreover, these companies are globally recognized and, according to Forbes, five of them rank in the top 50 of the world's most valuable brands.*

*Source: forbes.com, The World's Most Valuable Brands, as of October 2018.

Figure 4
Top 10 Issuers: Revenue and Assets Profile

Top 50 World's Most Valuable Brands

Firm	Sales Last 12m ($m)	Total Assets ($m)	Total Market Value ($m)
JPMorgan Chase & Co	$122,955	$2,590,050	$385,729
Bank of America Corp	$104,489	$2,291,670	$307,039
Goldman Sachs Group Inc.	$46,578	$968,610	$91,522
Morgan Stanley	$47,765	$875,875	$84,395
Citigroup Inc.	$93,153	$1,912,334	$175,332
AT&T Inc.	$158,368	$534,691	$239,864
Verizon Comms	$129,647	$263,303	$226,389
Apple Inc.	$255,702	$349,197	$1,050,895
Microsoft Corp	$110,175	$258,848	$824,947
Wells Fargo & Company	$100,983	$1,879,700	$283,478

Source: Bloomberg Finance L.P., Forbes, as of 15 August 2018. The information contained above is for illustrative purposes only. Past performance is not a guarantee of future results. Characteristics are as of the date indicated and are subject to change. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown.

A lot of debt doesn't indicate more risk than firms with less debt. If it did, there would be a linear relationship between credit rating and debt issuance. Due to the fact that a credit rating will not only factor into the amount of debt issued, but also the firm's capacity to service this debt, there is a limited relationship between debt issued and credit rating assessed, as shown below in Figure 5.

To prove this, in the analysis below firms were broken out by decile of debt issued within the Bloomberg Barclays US Corporate Bond Index. The first decile represents the largest issuers of debt, the second decile the second largest, and so on. The average Bloomberg Composite credit rating was calculated for each decile, first transforming the alphabetical credit ratings into numerical figures (AAA = 1, BB+ = 11) then calculating the average statistic. As shown, the first decile (the largest issuers of debt) has the highest credit rating, with a value of 6.9, or a rating of Single A. The 6th decile of debt issuers, with an average debt outstanding of $26 billion, has the lowest credit rating at 8.3, or BBB.

Figure 5
Bloomberg Credit Rating by Decile Weight (within Index)

1st Decile = Most Indebted
10th Decile = Least Indebted

Index
Bloomberg Barclays US Corporate Bond Index

Source: Bloomberg Finance L.P., as of 15 August 2018.

Fiction #3

Fixed income ETFs underperform active managers when markets are volatile.

Fact

During five systemically important volatile markets from the past 25 years, index-based fixed income exposures would actually have outperformed, on average, 77% of active managers.

SPDR ETFs analysed five significant market events over the last 25 years, representing periods of volatility or turbulence in the bond markets. These events included the aggressive US Federal Reserve rate hike in 1994, which led Fed Chair Alan Greenspan to classify the market as representing a 'bond conundrum'; the Global Financial Crisis; and the plunge in oil prices during 2016, which roiled global capital markets.

The analysis focused on the performance of active managers within the Morningstar US Intermediate Bond Category compared to the Bloomberg Barclays US Aggregate Bond Index ('the Agg'). The findings contradict the fiction that fixed income index-based exposures underperform active strategies.

As shown in Figure 6, the Agg never ranked outside the second quartile during the periods studied, and always outperformed the median manager. In fact, during three of the volatile events the index ranked in the top quintile. The belief that index-based exposures cannot withstand market volatility is clearly a misconception — the Agg outperformed more active managers than it underperformed.

So why have index-based strategies proven so resilient? During a downturn, spreads widen and default rates increase, while the flight to safety means that Treasuries are in demand. Unfortunately, any active manager with an overweight to credit, and therefore a higher credit beta, may be negatively impacted as default rates spike.

Furthermore, given that active managers are likely overweight credit, they are underweight duration. This duration underweight hurts performance as Treasury bonds rally amid the demand for perceived safe haven assets in a risk-off environment. In other words, many of the managers who outperformed the benchmark during an upmarket by being aggressive with their credit exposure would be hurt by that same credit bias.

This case study, while disproving the myth of index versus active during market downturns, does not disprove the notion of implementing both active and index-based exposures for efficient portfolio construction. Looking through a longer-term lens, there is clearly a place for both. Based on longer-term performance, active managers do have a tendency to outperform, evidenced by 59% and 49% of active managers outperforming the Bloomberg US Government/Credit Index over the last 5 and 10 years, respectively.* Of course, given that some active managers still underperform, an index-based exposure can help augment active manager exposures, thus benefiting long-term performance while lowering fees.

*Source: Morningstar, as of 31 July 2018.

Figure 6
Performance During Market Turbulence: Index vs. Active Managers

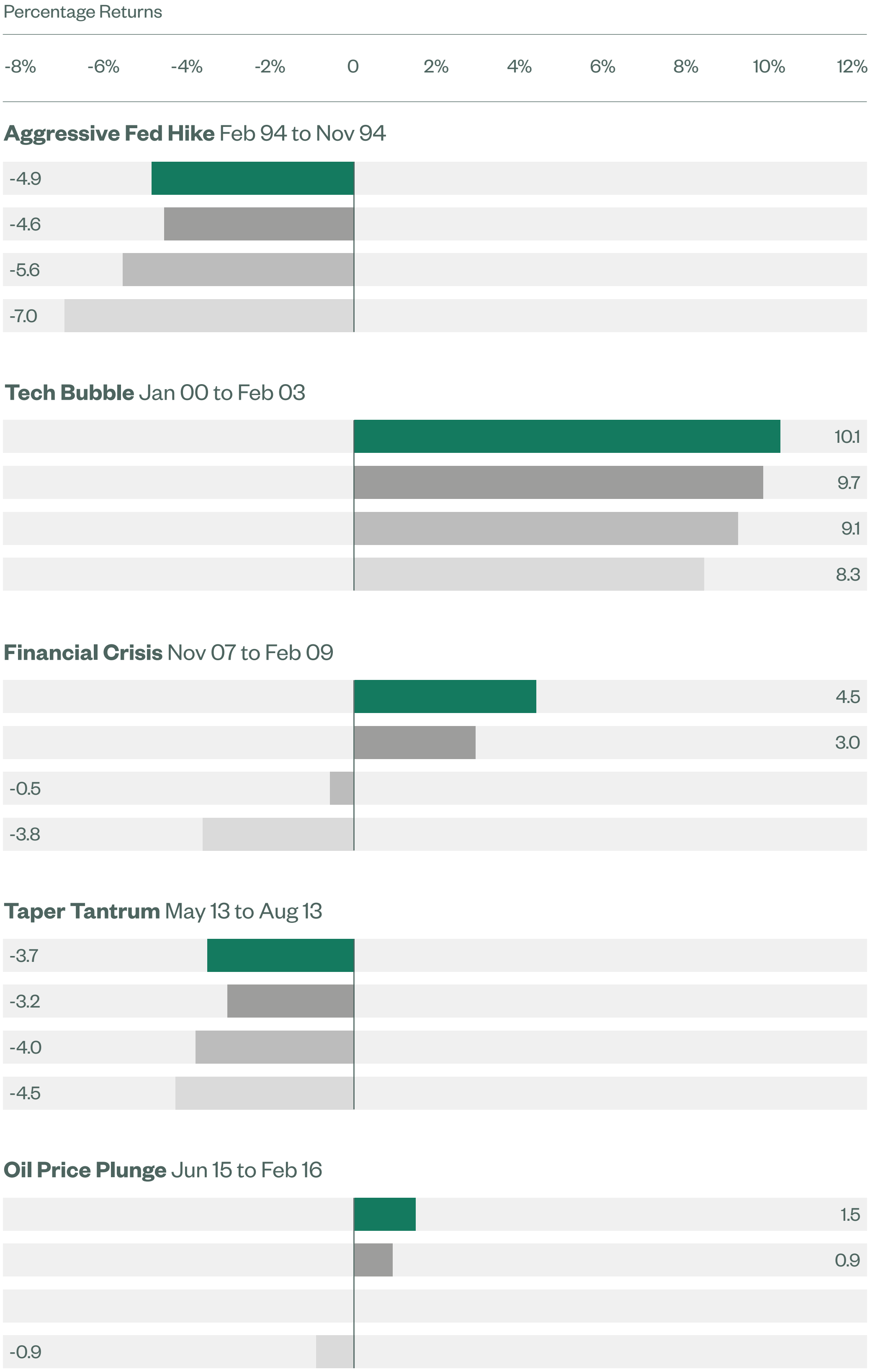
Bloomberg Barclays US Agg Bond Total Return

Manager Universe
Morningstar US Intermediate Bond Category

Top Quartile

Median

Bottom Quartile



Source: Morningstar, as of 31 July 2018. The information contained above is for illustrative purposes only. Past performance is not a guarantee of future results. Characteristics are as of the date indicated and are subject to change.

Fiction #4

Fixed income ETFs are not sufficiently liquid, and investors can run into trouble when many try to redeem at the same time.

Fact

Fixed income ETF liquidity is at least as liquid as the underlying market.

In order for an ETF — or any index mutual fund — to be sufficiently liquid, the underlying market must be sufficiently liquid. Liquidity in a fixed income ETF comes from the liquidity of the underlying market, and the creation/redemption mechanism makes it possible to convert liquidity from one product to another.

When thinking about the liquidity capabilities of an ETF, one should not turn to Average Daily Volume (ADV) and AUM as the primary metrics for decision-making. Many of the largest ETFs, in terms of ADV and AUM, started out as $10 million funds that traded $50,000 each day.

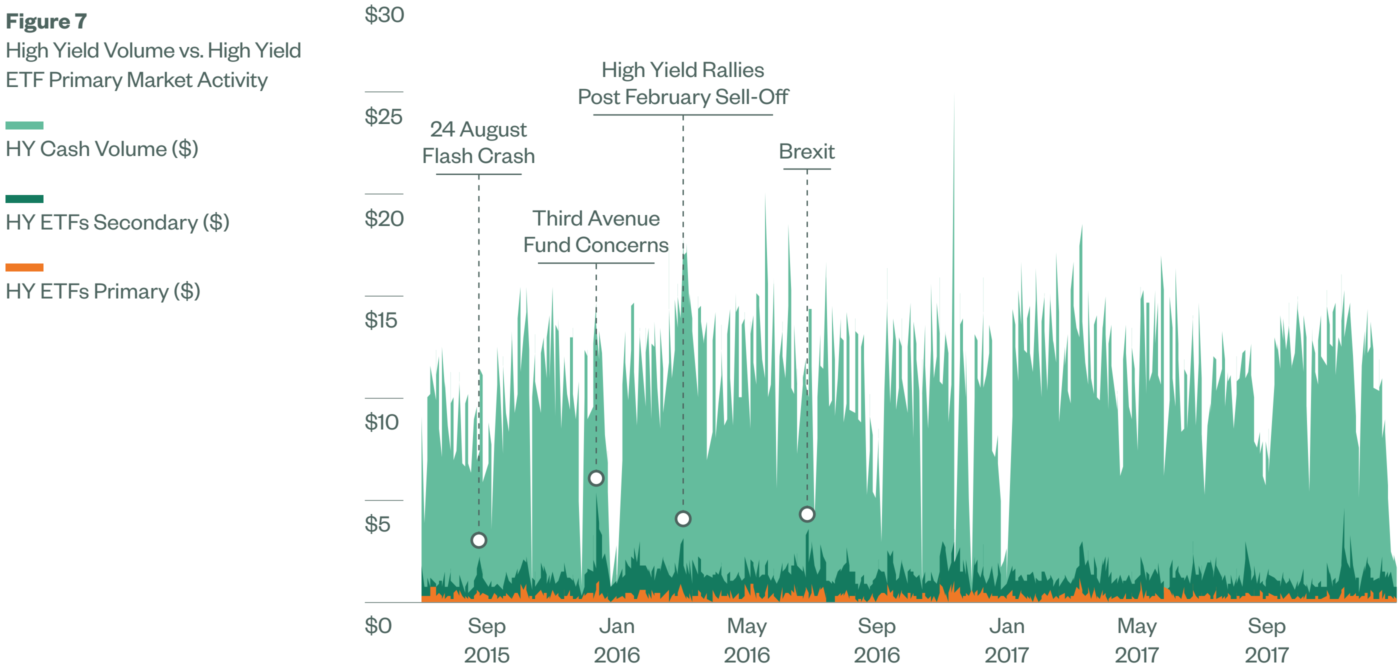
If a liquidity provider has the ability to buy and sell $1 billion worth of short-term US Treasuries, assuming there is a fluid creation/redemption process, that liquidity provider should be willing to make a $1 billion market in a short-term US Treasury ETF – even if it only has $15 million in assets and an ADV of $200,000 per day. This would also imply that markets such as distressed credit and CDOs do not belong in an ETF.

Investors do not actually redeem their shares (to be technical, based on the US markets). Rather, investors sell their shares to liquidity providers, and the Authorized Participants interact with the fund by redeeming their shares for bonds. In times of stress, if the redemption mechanism of the fund remains fluid, there should be no issues with market makers being able to bid on ETF shares, and to then redeem those shares with the fund.

The 'basketing' process may change intraday, which isn't cause for alarm, and portfolio managers often realign baskets throughout the day for a particularly busy fund. If a large subset of Authorized Participants wanted to redeem at the same time, the redeem basket would become a larger and larger representation of the entire fund holdings on a pro-rata basis. The reason for this is that it helps the portfolio manager to keep the fund in line with the index, as tracking error minimisation is their primary objective.

Price is also a concern for many investors in stressed selling. Broadly speaking, in a market where investors are selling into panic, asset prices move to where risk clears. Risk clearing is a dichotomy of two concepts. Market makers will step in to provide bid-side liquidity at the point where they believe the market is oversold, and investors will step in to buy when yields approach attractive levels (see Figure 7). The ETF industry is confident that, given a fluid creation/redemption process, the price where risk clears in an ETF will be very similar to the price where risk clears in the underlying market.

Figure 7
High Yield Volume vs. High Yield ETF Primary Market Activity



Source: Bloomberg Barclays L.P., as of 28 September 2018.

The term 'structural optionality' can be used when thinking about holding an ETF versus its underlying bonds in stressed markets. ETF holders have three options when exiting a position:

- Sell the ETF directly to a liquidity provider on an OTC basis.
- Sell the ETF on exchange.
- Work with an Authorized Participant that will redeem the shares for bonds (on the investors' behalf), and give the investors the bonds, which they can then sell (and then will be in the same position that the investors would have been if they had just bought the bonds in the first place).

In a steady market, the role of the secondary market is to provide at-exchange liquidity, where buyers and sellers can meet to exchange risk at tight bid/ask for sub-block sizes. Many investors satisfy daily end-customer inflows/outflows by tapping into the secondary market for daily maintenance.

When executing larger trades, where significant secondary market impact may occur, it is prudent for the investor to trade on an OTC basis. In a stressed market, where OTC liquidity may be less available, the secondary market is a place for buyers and sellers to meet to exchange risk.

Fiction #5

Fixed income ETFs are only useful for the largest, most straightforward bond exposures. For niche areas, such as emerging market debt, active managers provide a better return.

Fact

A high percentage of active managers in the emerging market debt space have underperformed their benchmark each year since 2013.

In the past, many investors believed an active approach served as the best way to invest in emerging market debt (EMD). That belief has been based on a few assumptions, for example that indexed exposure is too expensive to be effectively implemented in emerging markets. Additionally, many investors view EMD as an inefficient market where active managers are needed to identify and extract value, and to avoid weak segments of the market.

The reality is different. EMD now offers much greater liquidity and diversity, and the majority of active managers fail to outperform their benchmarks over the longer term. While active managers have struggled to consistently deliver excess returns, indexed strategies have evolved and now possess sophisticated techniques capable of delivering the return of the benchmark in a cost-efficient[1] manner.

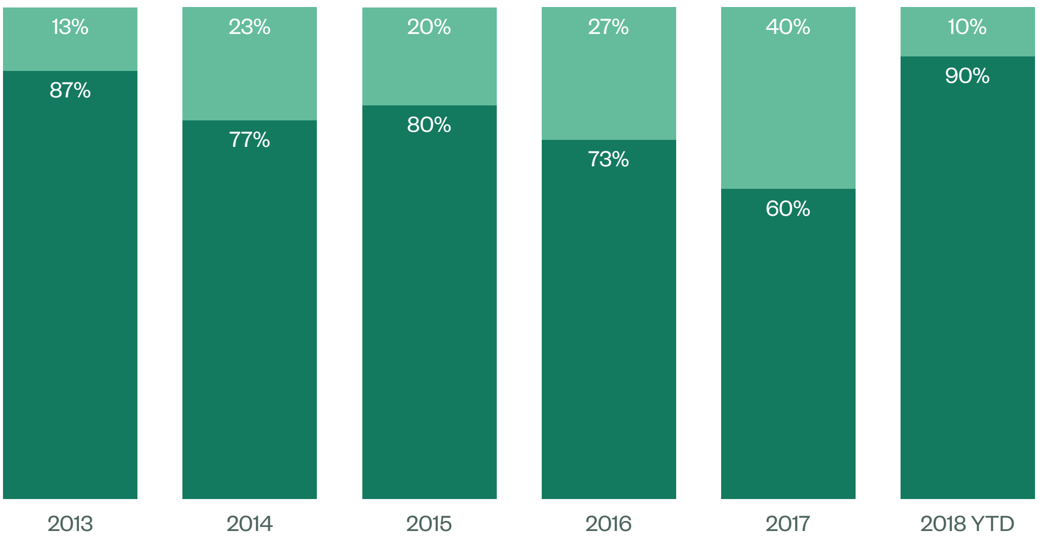
To highlight this performance gap, we analysed the active managers in the Morningstar database that track the JPM GBI-EM Global Diversified Index (GBI-EM). As illustrated below, while some active managers outperform their benchmarks, the majority have failed to do so over the longer term. This pattern of underperformance indicates that many active managers consistently struggle in the EMD space — no single year is to blame.

Figure 8
Active Manager Performance in Emerging Market Debt (%)

Underperforming Managers

Outperforming Managers

Universe
Morningstar JPM GBI-EM Global Diversified Index



Source: Morningstar, as of 31 August 2018. The information contained above is for illustrative purposes only.

[1] Frequent trading of ETFs could significantly increase commissions and other costs such that they may offset any savings from low fees or costs.

Fact

An ETF's diversification can help to mitigate political and sentiment-driven events, which are difficult to predict.

The illustration below shows active manager underperformance during periods of heightened country market risk and volatility. There seems to be a correlation between market underperformance and active manager underperformance. The correlation appears most acute in the local currency universe, where the worse the performance of the index, the higher the percentage of active managers that underperformed.

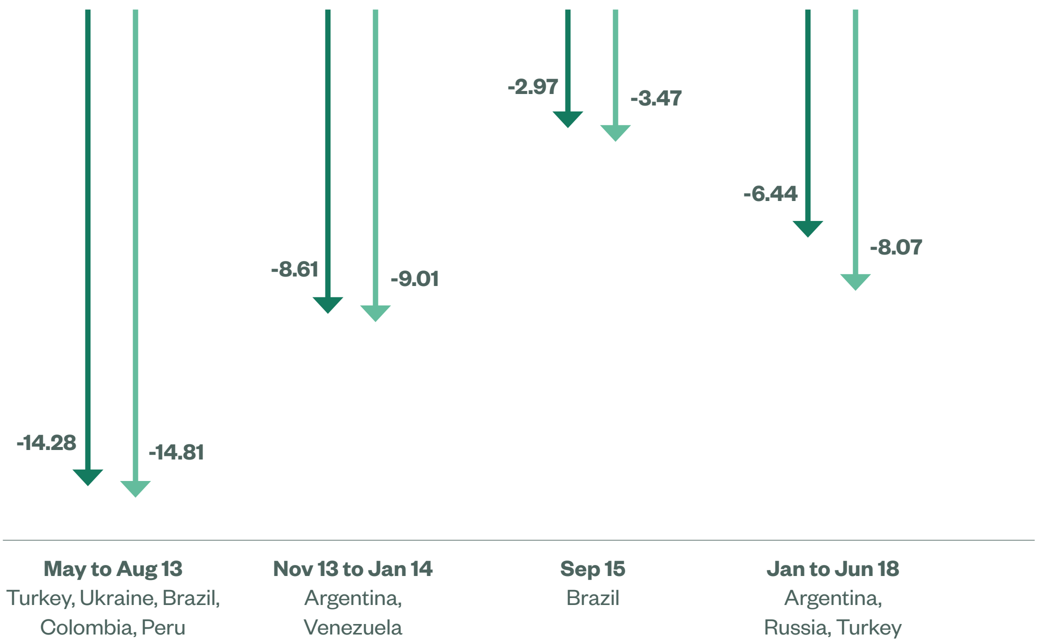
In local currency debt, foreign exchange (FX) is the short-term performance driver, while local rates are a longer-term driver. EM currencies are typically the main adjustment valve to reflect market sentiment, which means that making the right call, especially in times of heightened market volatility, is particularly difficult. EMD is inherently volatile, and returns often do not reflect fundamentals, as they are driven by investor sentiment and political risk, which are difficult for active managers to predict.

An ETF's diversification can help mitigate potential credit events. Additionally, a credit risk premium can be harvested across the overall diversified exposure to compensate for such events. Having broad index exposure appears to potentially offer investors protection from some of the inherent behavioural biases of active managers and can provide higher return potential, despite offering exposure to both stronger and weaker parts of the universe.

Figure 9
EMD Performance During Periods of Higher Volatility (Index vs. Active Universe)

JPM GBI-EM Global Diversified TR USD

Asset-Weighted Active Universe



Source: Bloomberg Finance L.P., as of 31 August 2018. The information contained above is for illustrative purposes only.

Fiction #6

Index investing doesn't work for bonds because there are too many bonds to index efficiently.

Fact

An index investment manager's objective is to seek to track an index's return with minimal tracking error. The objective is to not hold every bond in the index.

It is generally not possible to hold every bond in an index, given the sheer number of bonds. As an example, the Bloomberg Barclays US Aggregate Index contains 10,012 different bonds.* That total includes:

- US Treasury bonds
- Bonds from government-related agencies such as the Tennessee Valley Authority
- Bonds from US corporate issuers
- Securitised bonds
- USD-denominated bonds from index eligible foreign issuers

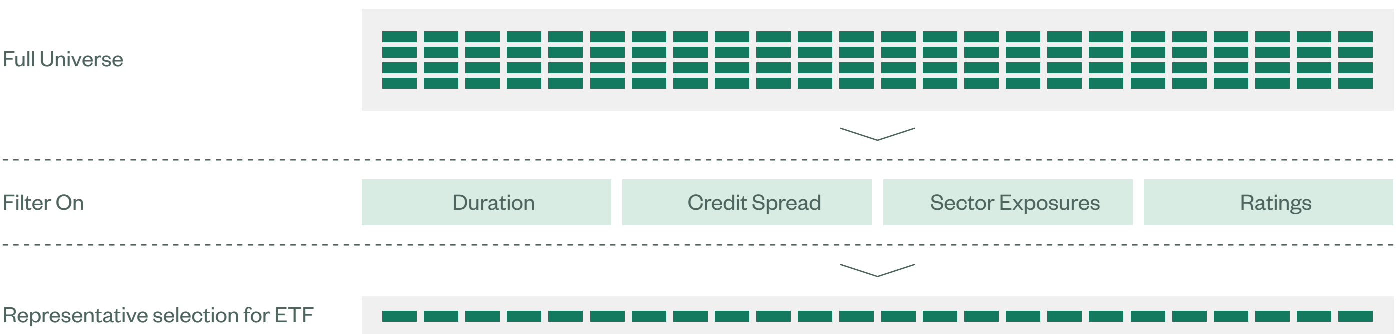
Given the diverse holdings, portfolio managers attempt to replicate the risk characteristics of the index through sampling, rather than by holding every security. This means replicating the duration, curve, and issuer credit exposure of the index. Sampling can be the most efficient technique for constructing portfolios, as many broad fixed income indices include a large number of securities, but not all of those securities can be purchased. Coupled with potentially high transaction costs to access illiquid bonds, full replication isn't always possible or practical. With a sampling approach, a PM can seek to build a portfolio with the same characteristics as the index.

At a high level, PMs can generally take two approaches to ensure tracking error remains tight and performance deviations are minimal as a result of exposure differences: top-down or bottom-up.

Approach 1 — Top-down approach

This approach seeks to align the common factors of the ETF to the index, as these are the key variables that drive market beta. The factors include:

- **Duration** considering how to match on key rate duration exposures.
- **Credit spread** examining differences between option-adjusted spread, as well as other metrics such as option-adjusted spread duration.
- **Sector exposures** looking at the sector and industry compositions to manage macro impacts.
- **Ratings** allocating at the credit rating level.



*Source: Bloomberg Finance L.P., as of 31 July 2018. The above diagram is for illustrative purposes only.

Approach 2 — Bottom-up approach

The bottom-up approach is often used in markets such as high yield or convertible bonds, where PMs typically find more price volatility.

In a bottom-up approach, a PM tries to identify large or outsized idiosyncratic risks and mitigate them. An example of this is making the decision to purchase one bond instead of another from a company based on its position in the credit curve, a factor that can impact single bond volatility.

As an illustration, we can consider the characteristics of a representative SPDR ETF tracking the Bloomberg Barclays US Aggregate Bond Index. As shown below, while the fund may only hold 4,450 out of 10,000-plus securities in the Index, the underlying portfolio matches on other characteristics such as yield, coupon, maturity, option-adjusted spread, spread duration, key rate durations and average credit rating.

Figure 10
Characteristics of a Representative SPDR ETF Tracking the US Aggregate Bond Index

	Illustrative ETF Portfolio	The Agg	Plus / Minus
Coupon (%)	3.2	3.2	0
Local Yield to Worst	3.3	3.3	0
Option-Adjusted Spread (bps)	40.5	41.3	-0.8
Option-Adjusted Duration (Years)	6	6	0
Option-Adjusted Spread Duration (Years)	6.1	6.1	0
Average Maturity (Years)	8.4	8.4	0.1
Key Rate 6M	0	0	0
Key Rate 3Y	0.5	0.5	-0.1
Key Rate 5Y	0.8	0.8	0
Key Rate 10Y	1.1	1	0.1
Key Rate 20Y	1.3	1.3	0
Key Rate 30Y	1.2	1.1	0

Source: State Street Global Advisors, Bloomberg Finance L.P., as of 28 September 2018. The above example is for illustrative purposes only.

Fiction #7

Many investors are not set up to trade fixed income ETFs — the process is difficult, and understanding ETF pricing and liquidity is challenging.

Fact

The complexity can depend on the needs of the investor, but there are a few straightforward ways to access fixed income ETFs.

Investors seeking to trade fixed income ETFs have three avenues:

3 Ways to Trade Fixed Income ETFs

1 — Exchange Liquidity

The client would need access to a front-end trading platform and a brokerage or custodial account, if not self-clearing. The investor would also need their own DTC number if they are self-clearing.

2 — OTC Liquidity

The client would need to establish trading relationships and have account settlement instructions to be able to book and settle individual trades.

3 — Broker

If the client plans to use a broker, they would simply require a trading account set up with the broker.

Source: State Street Global Advisors, as of 31 October 2018. The above diagram is for illustration purposes only.

In understanding the pricing of ETFs, one must understand the components (principal with bid-side pricing, interest, cash, undistributed income, etc.) that go into NAV construction, as well as the costs associated to create and redeem (including bid/ask).

ETF issuers generally publish daily reports that include all of these components and operational costs, such that anyone should be able to price the ETF. Pricing is dynamic because it very much depends on size, time of trade (it is always best to trade when the underlying market is liquid, and the creation/redemption window is open), hedging costs, and balance sheet costs. Pricing is also a dynamic concept because bid/ask in buying 50,000 bonds is different than bid/ask in buying 1 million bonds.

Fixed income ETF liquidity is another important consideration, and to understand this liquidity one must also understand the dynamics that feed into it. Liquidity depends not only on the size of the trade, but also on the liquidity of the underlying securities. One should think of underlying liquidity in terms bid/ask, market impact, and size constraints.

As a guiding principle, if the size you are looking to trade is acceptable in the underlying market, it should be acceptable in the ETF. Capital markets teams can serve as a valuable resource for investors. They can provide guidance on liquidity, as they are in tune with the markets and have robust relationships with liquidity providers. Capital markets teams can opine on optimal trading strategies depending on the ETF, the underlying market, the size of the trade and, most importantly, the priorities of the executing trader.

Important Risk Information

Marketing Communication.
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Start with rigour
Build from breadth
Invest as stewards
Invent the future

For four decades, these principles have helped us be the quiet power in a tumultuous investing world.

Helping millions of people secure their financial futures.

This takes each of our employees in 27 offices around the world, and a firm-wide conviction that we can always do it better. As a result, we are the world's third-largest asset manager with nearly $2.81 trillion* under our care.

*This figure is presented as of 30 September 2018 and includes approximately $28 billion of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated.

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