
Fixed Income ETFs Fact vs. Fiction

Are fixed income ETFs:

- 1 Distorting the market?
- 2 Difficult to sell in volatile markets?
- 3 Causing investors to be overweight to the most indebted companies?
- 4 More likely to underperform active managers in volatile markets?
- 5 Only useful when tracking the broadest, simplest bond indices?
- 6 Fundamentally inefficient because bond indices have too many constituents?
- 7 Difficult for investors to trade and accurately price?



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 \$370 billion in fixed income assets, managing 30+ currencies across 40 different countries.**

Proven Track Record

- 23 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.

\$370 bn**

in fixed income assets

23 Years

of bond index investing

100+

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 31 December 2018.

Content

Fiction #1 The fixed income ETF market has become so large that it distorts the bond market. **4**

Fiction #2 Fixed income ETFs are not sufficiently liquid, and investors can run into trouble when many try to redeem at the same time. **6**

Fiction #3 When using a fixed income ETF, the investor is overweight the most indebted — and therefore the riskiest — companies. **8**

Fiction #4 Fixed income ETFs underperform active managers when markets are volatile. **10**

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. **12**

Fiction #6 Index investing doesn't work for bonds because there are too many bonds to index efficiently. **14**

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. **16**

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.

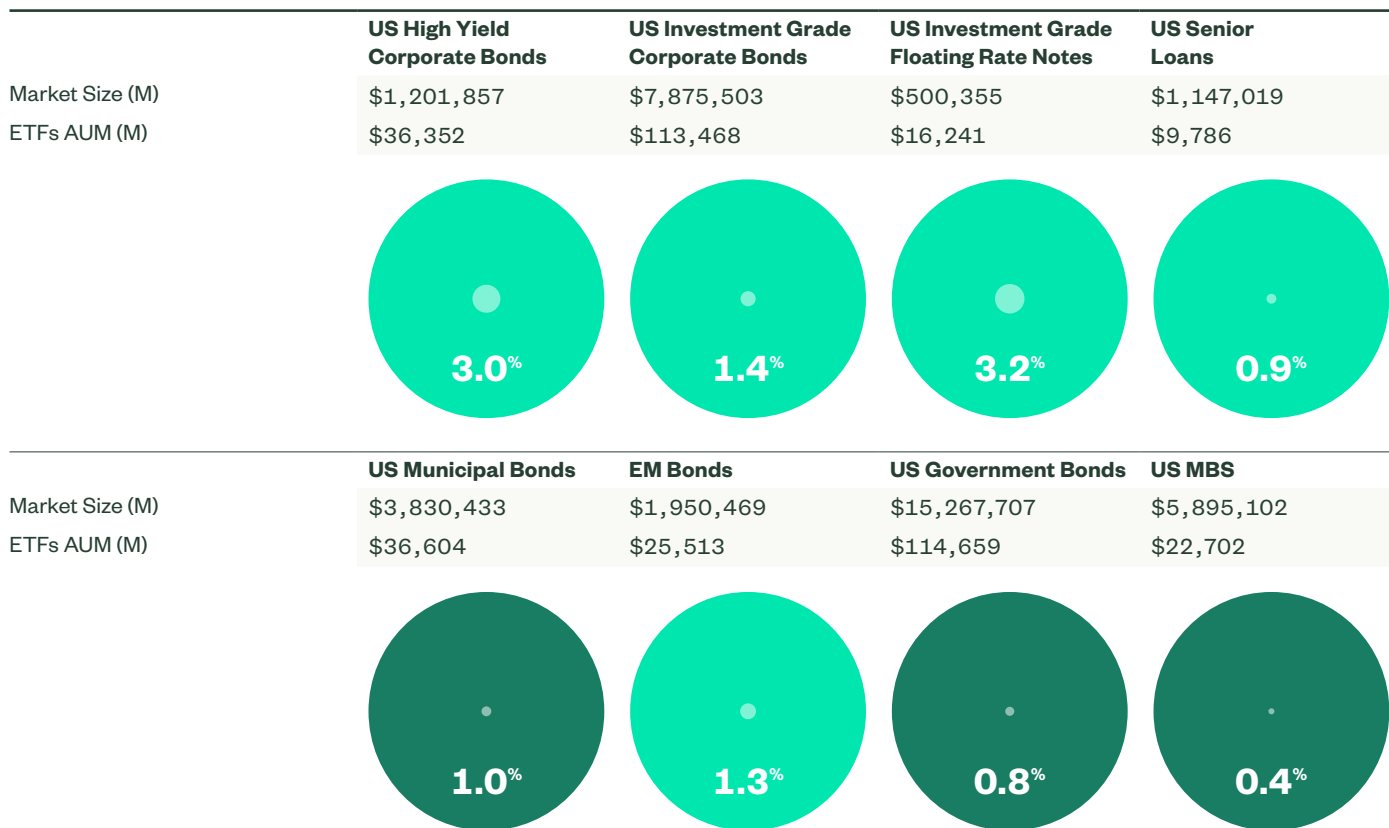
The fixed income ETF market is still relatively young — the first fixed income ETF launched in 2002. Only 10 years ago, assets under management in fixed income ETFs represented \$48 billion and circa 1.9% of the global fixed income fund industry, according to Morningstar. Meanwhile, ETFs accounted for 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

Relative sizes of ETF AUM versus total market AUM (\$m)



Market Size Data: SIFMA (as of Q4 2018; US IG Corporate Bonds, US Government Bonds, US Municipal Bonds), Bloomberg (as of December 31, 2018; US High Yield Corporate Bonds, US IG FRNs, EM Bonds, US MBS), The Loan Syndications & Trading Association (as of December 31, 2018; US Senior Loans), ETF AUM: Bloomberg Finance, L.P., (as of 12/31/2018). Average Daily Volume (3M ADV) Bond Trading: Bloomberg Finance, L.P. (as of December 2018), EMTA (as of Q1 2018; EM Bonds), SIFMA (as of December 2018; US Government Bonds, US Municipal Bonds, US MBS); BondCliq (US IG FRNs, as of December 2018). Average Daily Volume (3M ADV) ETF Trading: Bloomberg Finance, L.P. (as of December 2018).

Trading Volumes

Fact

In some fixed income sectors, ETFs are becoming an important source of additive liquidity to those respective markets.

ETFs generally account for <5% of assets in almost all segments of the broad USD fixed income universe; in many cases however, these instruments represent a higher proportion of the traded volume.

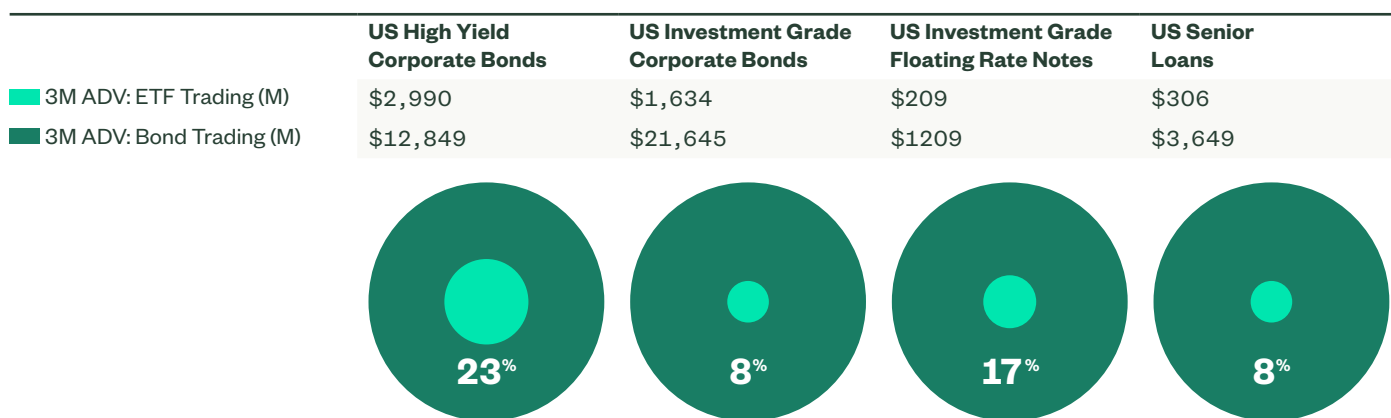
Thus the FI ETF can be a source of additive liquidity to those markets. The stock exchange becomes the venue where a variety of investor types congregate to position their portfolios and express a fixed income beta exposure in either direction.

This two-way flow in shares of the ETF typically results in muted impact on the underlying market (for example, an ETF consisting of senior loans or high yield bonds may see only \$1 of net share creation or redemption for every \$6-8 of secondary trading value).

In high yield, ETF trading may have begun to supplant volumes in synthetic products such as total return swaps and credit derivative swap indices (CDX); investors often prefer the funded exposure due to its performance profile which better matches the cash bond market and avoids the multiple basis risks that exist with a synthetic exposure.

Figure 2

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



Market Size Data: SIFMA (as of Q3 2018; US IG Corporate Bonds), Bloomberg (as of December 31, 2018; US High Yield Corporate Bonds, US IG FRNs), The Loan Syndications & Trading Association (as of December 31, 2018; US Senior Loans), ETF AUM: Bloomberg Finance, L.P., (as of 12/31/2018). Average Daily Volume (3M ADV) Bond Trading: Bloomberg Finance, L.P. (as of December 2018), Average Daily Volume (3M ADV) ETF Trading: Bloomberg Finance, L.P. (as of December 2018).

Fiction #2

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

Fact

a) A fixed income ETF's liquidity is at least as liquid as the underlying market that it tracks.

b) The ability to invest in an ETF via the primary and/or the secondary market can provide greater liquidity compared with alternative approaches to bond investing, such as index and actively managed mutual funds.

The unique structure of a fixed income ETF — which packages a diversified portfolio of bonds into a single, tradeable equity — provides two sources of liquidity for investors. These two sources, 'primary' which can be accessed via an authorised participant and 'secondary' which can be accessed directly, define a fund's overall liquidity profile.

Primary market An ETF is a portfolio of individual securities — i.e. equities or bonds — that form a single fund. The shares of this fund are publicly listed and trade on an exchange (the secondary market). Normally investors buy or sell ETF shares via the secondary market. However, if their buy or sell order is too large to trade on the exchange, an alternative approach could be for the investor to approach a market maker who in turn could trade via the primary market.

The size of the investor's order and the trading volumes of the ETF will determine whether the secondary market can accommodate the trade. If the investor could only trade via the secondary market, a large order may take time to execute, meaning they would be exposed to market risk for an extended period.

To counter this potential problem, ETF issuers partner with a pool of authorized participants ('APs') who, through managing the primary market, ensure that investors can buy or sell shares in the ETF in various market environments. These APs are also known as 'market makers': their role is typically carried out by investment banks or specialist trading firms. APs are able to create new shares for the ETF in the case of a large buy order ('creation') and redeem existing shares in the case of a large sell order ('redemption'). This intraday mechanism is called creation/ redemption and means that ETFs are able to accommodate large buy or sell orders beyond the liquidity provided by the secondary market.

This creation / redemption mechanism facilitates instantaneous order executed in size and at a price level which the underlying bond market supports. For example, if an AP has the ability to buy and sell \$1 billion worth of US Treasuries, that AP should be willing to make an equivalently sized market in a US Treasury ETF — even if the fund has a low average daily trading volume and small AUM. The liquidity of a fixed income ETF is therefore at least equal to the liquidity of the underlying bond market.

Secondary market The secondary market is simply the exchange where ETFs are listed and trade. An ETF's secondary market liquidity can be assessed by looking at its average daily trading volume and spread (i.e. the difference between the offer price and bid price, which are the prices at which investors can buy or sell the fund), as well as premiums and discounts to net asset value.

As outlined above, the full scale of an ETF's liquidity can only be accurately measured when the primary market's liquidity is also included.

Case Study
US High Yield

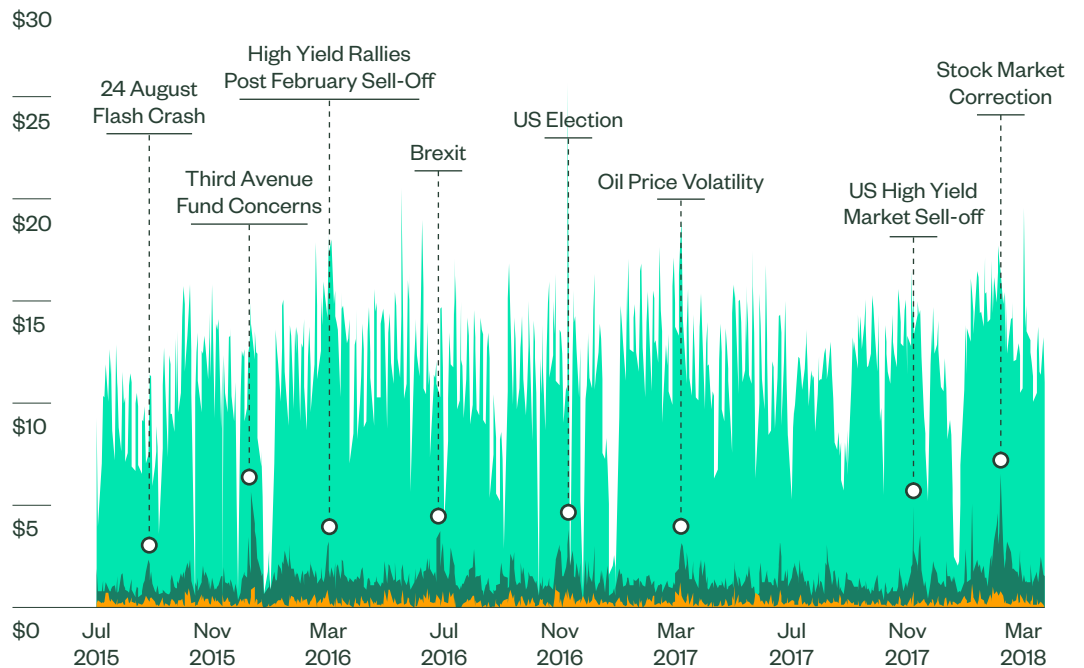
US High Yield liquidity is occasionally highlighted as a potential area of concern particular for ETFs in times of market stress. However, analysis of the market’s trading volume reveals that ETFs actually compliment the broader market’s liquidity profile.

Figure 3 below shows historical high yield market trading volumes and illustrates how both types of ETF liquidity — primary and secondary market volumes — are dwarfed in comparison to the broader HY cash market.

It demonstrates how, in periods of market stress, ETF secondary trade volume tends to spike but the primary market volume remains relatively subdued in comparison. This suggests that even in times of market stress, there is sufficient secondary market ETF liquidity for investors to trade without accessing the primary market and subsequently the broader market. It also highlights that, if investors tried to redeem at the same time, the primary ETF market could be used as a liquidity source especially given the scale of trading volume in the US HY cash market.

Figure 3
 High Yield Volume vs. High Yield
 ETF Primary Market Activity

- █ HY Cash Volume (\$)
- █ HY ETFs Secondary (\$)
- █ HY ETFs Primary (\$)



Source: Bloomberg Barclays L.P., as of 29 March 2018.

Key Takeaway

Even in times of severe market volatility, there was sufficient liquidity in the secondary market to allow investors to buy and sell their positions without relying on the primary market.

How does the liquidity of a fixed income ETF compare to other approaches to bond investing?

The table below highlights some of the differences between trading ETFs, Index Funds, Active Managers and Single Securities. Fixed income ETFs are the only investment vehicle for the bond market that provides two layers of liquidity and offers transparent, diversified access with intraday pricing.

	Exchange Trade Fund	Index Fund	Actively Managed Fund	Single Bond	
Trading venue	On Exchange (Secondary)	Primary market	Via fund provider, requiring written application	Via fund provider, requiring written application	Over the counter ¹ , voice or electronically-enabled
How frequently can investors gain access?	Intraday		Typically close of business on trade date	Typically close of business on trade date	Intraday
Trade notification period	None		Typically 1 to 3 Days	Typically 1 to 3 Days	None
Minimum investment size	1 Share		Fund's Minimum Investment Size	Fund's Minimum Investment Size	Bond's Minimum Price/ Minimum Increment
Can investors see intra-day pricing?	Yes		No	No	Yes
How concentrated is the portfolio?	Diversified		Diversified	Greater concentration	Single Security

Fiction #3

When using a fixed income ETF, the investor is overweight the most indebted — and therefore the riskiest — companies.

Fact

a) The ability to issue debt is directly related to a company's overall financial strength.

b) An ETF's index construction inherently provides diversification benefits and often employs constituent capping to mitigate concentration risks.

In addition to the broad diversification afforded by indices, large issuers of debt are also companies with substantial asset bases and revenue profiles. 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 4, the ranking of the most indebted firms, based on the amount of debt included in the Bloomberg Barclays Euro Corporate Bond Index, is very different to the ranking of the firm's total short and long debt overall.

Figure 4

Top 10 Holdings in the Bloomberg Barclays Euro Corporate Bond Index

Weight in Index (%)	2.18	1.66	1.49	1.29	1.24	1.22	1.19	1.17	1.11	1.05
Rank by Debt Included in Index	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Rank by Short-Term and Long-Term Debt	129th	31st	56th	102nd	54th	25th	63rd	551st	140th	45th
Market Cap EUR	75,777,858	53,922,558	Co-op	133,967,045	Co-op	30,527,555	144,254,646	53,866,315	47,337,650	41,330,159
12M Net Sales EUR (Millions)	235,849	42,516	Co-op	166,024	Co-op	19,735	54,619	167,362	98,467	31,303
	Volkswagen	BNP	Rabobank	Total	Banque Federative du Credit Mutuel	Credit Agricole	Anheuser Busch	Daimler	BMW	ING

Source: Bloomberg Finance L.P., as of 31 January 2019. 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.

A high level of debt for an issuer has little to do with the company's capacity to pay or credit worthiness.

Firms with a larger debt load do not pose greater risk for investors than firms with smaller debt loads. If it were the case that large debt loads equated to greater credit risk, the corporate bond market would exhibit a linear relationship between credit ratings and debt outstanding. However, credit rating agencies consider numerous factors besides amount of debt, including capacity to service debt.

Fiction #4

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 20 years, representing periods of volatility or turbulence in the bond markets. These events included the so-called the Global Financial Crisis; the Greek Debt 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 Bloomberg Barclays Euro Agg Bond Total Return index ('the Agg'). The findings contradict the fiction that fixed income index-based exposures underperform active strategies.

As shown in Figure 5, the Agg outperforms the median manager in all. In fact, during three of the volatile events, the index ranked in the top quartile. 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. Managers who outperform the benchmark during an upmarket tend to be unable to market time a downturn and reduce risk as all investors are leaving the party. These active managers' credit exposure hurts performance during risk-off environments. Another view is that active strategies tend to be more concentrated whereas indexing provides a broader exposure which potentially lowers idiosyncratic risk during market volatility through diversification.

Lastly, this analysis does not preclude the implementation of both active and index exposures for efficient portfolio construction. Looking through a longer-term lens, there is clearly a place for both; index-based exposures can augment active exposures, thus benefiting long-term performance while lowering fees.

*Source: Morningstar, as of 31 July 2018.

Percentage Returns

-4% -2% 0 2% 4% 6% 8%

Figure 5

Performance During
Market Turbulence: Index vs.
Active Managers

Bloomberg Barclays
Euro Agg Bond Total Return

Manager Universe

Morningstar EUR Diversified
Bond Category

Top Quartile

Median

Bottom Quartile

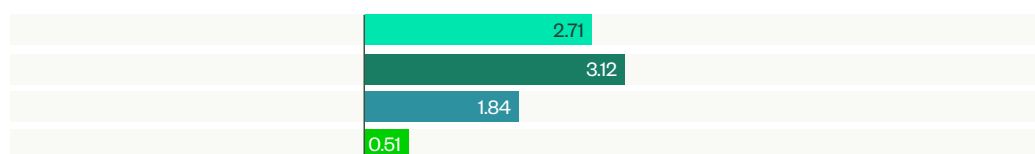
Tech Bubble Jan 00 to Feb 03



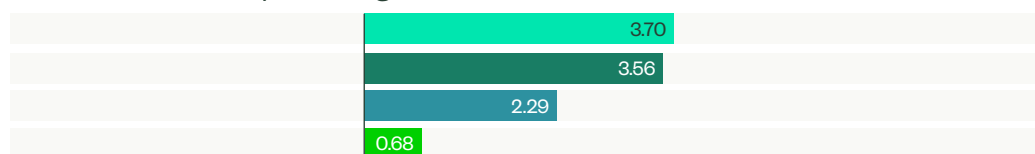
Financial Crisis Nov 07 to Feb 09



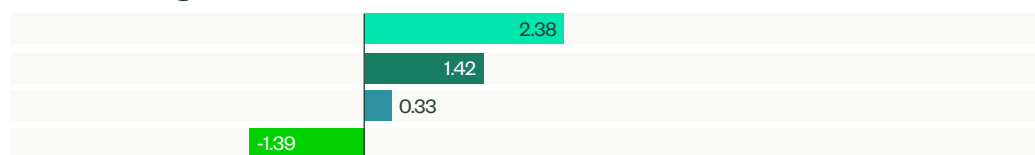
Greek Debt Crisis Jan 10 to Dec 11



Trichet Rate Hike Apr 11 to Aug 11



Oil Price Plunge Jun 15 to Feb 16



Source: Morningstar Direct as of 31 January 2019. 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 #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-efficient¹ 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 6

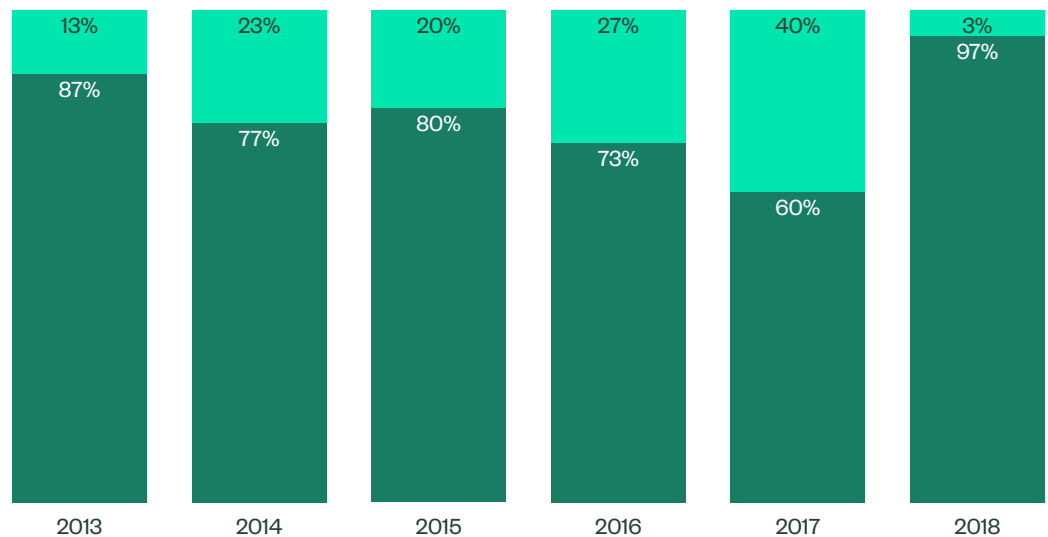
Active Manager Performance in Emerging Market Debt (%)

Underperforming Managers

Outperforming Managers

Universe

Morningstar JPM GBI-EM Global Diversified Index



Source: Morningstar, as of 31 December 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.

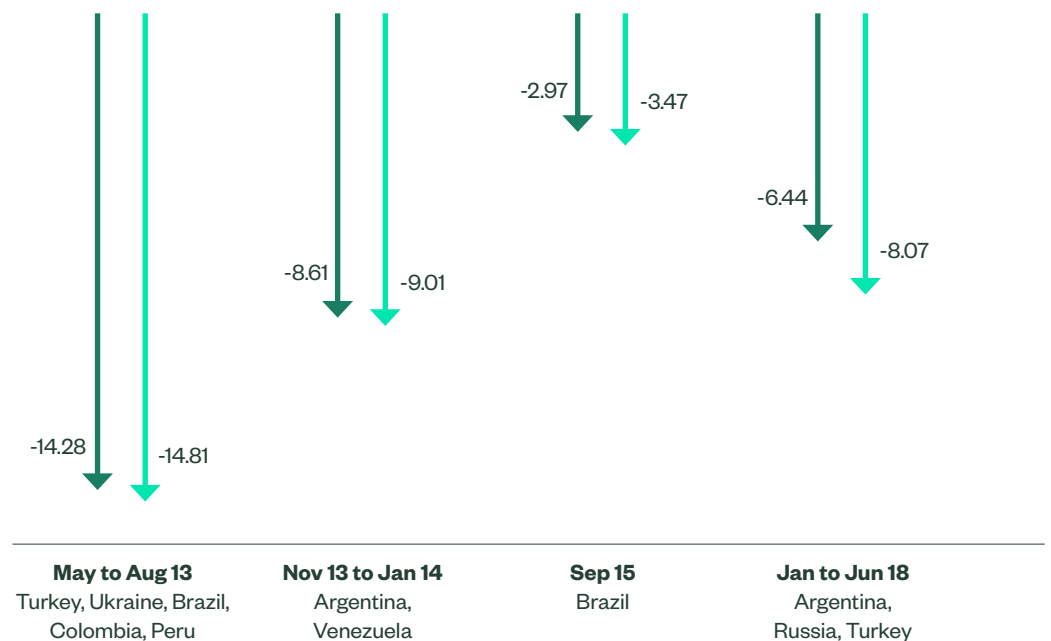
Figure 7 below, shows active manager underperformance during periods of heightened country market risk and volatility. There seems to be a correlation between market underperformance and active manager underperformance. The correlation appears most acute in the local currency universe, where the worse 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 7
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 Euro Aggregate Index contains 5,026 different bonds.* That total includes:

- Euro Government bonds
- Bonds from Supranational bonds such as Kreditanstalt Fuer Wiederaufbau (KfW)
- Bonds from European corporate issuers
- Securitised bonds
- Euro-denominated bonds from foreign issuers

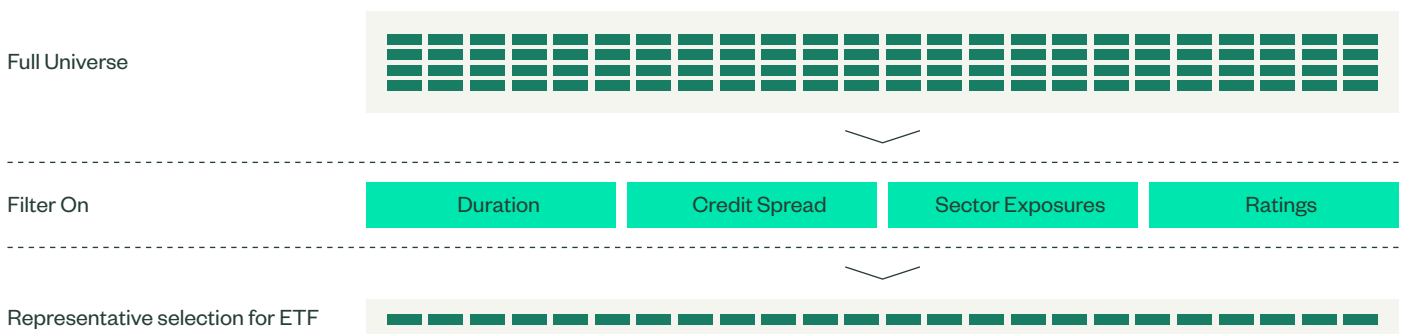
Given the diverse holdings, portfolio managers attempt to replicate the risk characteristics of the index through sampling, rather than by holding every security. This means replicating the duration, curve, and issuer credit exposure of the index. Sampling can be the most efficient technique for constructing 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 28 February 2019. 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 Euro Aggregate Bond Index. As shown below, while the fund may only hold 1,514 out of nearly 5,000 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 8
Characteristics of a
Representative SPDR ETF
Tracking the Euro Aggregate
Bond Index

	Representative SPDR ETF	Bloomberg Barclays Euro Aggregate Bond Index	Plus/Minus
Local Yield to Worst	0.65	0.66	-0.01
Option Adjusted Duration	6.75	6.73	0.01
Contribution to Duration	6.75	6.73	0.01
Option Adjusted Spread (OAS)	82.3	82.9	-0.6
Coupon	2.02	2.26	-0.23
Bloomberg Composite Rating	A+	A+	
Key Rate 6M	0.00	0.00	0.00
Key Rate 1Y	0.09	0.10	-0.01
Key Rate 2Y	0.24	0.24	0.00
Key Rate 3Y	0.57	0.57	0.00
Key Rate 5Y	1.00	0.95	0.05
Key Rate 7Y	1.21	1.22	-0.01
Key Rate 10Y	1.58	1.54	0.03
Key Rate 20Y	1.27	1.30	-0.03
Key Rate 30Y	0.79	0.81	-0.02

Source: State Street Global Advisors, Bloomberg Finance L.P., as of 31 January 2019. The above example is for illustrative purposes only.

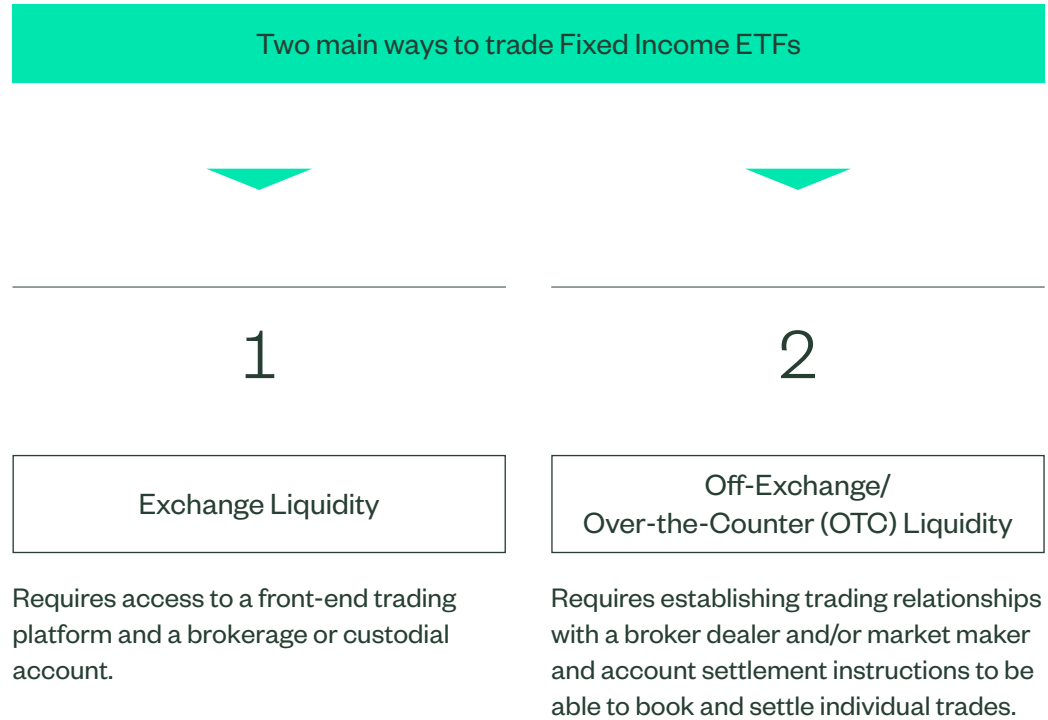
Fiction #7

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

Fact

Investors seeking to trade fixed income ETFs have two primary avenues:

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



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

When considering whether to trade on exchange or OTC, clients should primarily consider their trade size. As you would expect, similar to single stock equities, larger trade sizes exceeding average daily volume should be handled with greater care and clients should work with a broker dealer or market maker OTC.

As a guiding principle, if the trade size is typical in the underlying market, it should be acceptable in the ETF. Capital markets teams can serve as a valuable resource for investors to provide guidance on liquidity. These professionals 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.

Some investors may wish to understand the components that are used to price an ETF, such as principal, interest, cash, accrued interest/undistributed income. This information is used in NAV construction and is factored into the costs that a broker must bear creating/redeeming ETF shares, which in turn is embedded in the prices they are willing to buy and sell ETF shares.

ETF issuers generally publish daily reports that include all of these components, such that any investor is able to price the ETF. Nonetheless, pricing remains dynamic, as it is dependent on factors like time of trade (it is generally better to trade when the underlying market is liquid and the creation/redemption window is open); hedging costs; and dealer balance sheet charges. And of course pricing is dynamic because bid/offer can vary with trade size.

State Street Global Advisors Global Entities

Australia: State Street Global Advisors, Australia Services Limited (AFSL Number 274900, ABN 16 108 671 441) ("SSGA, ASL"). Registered office: Level 17, 420 George Street, Sydney, NSW 2000, Australia. T: 612 9240-7600. Web: ssga.com.

Belgium: State Street Global Advisors Belgium, Chaussée de La Hulpe 120, 1000 Brussels, Belgium. Telephone: 32 2 663 2036, Facsimile: 32 2 672 2077. SSGA Belgium is a branch office of State Street Global Advisors Limited. State Street Global Advisors Limited is authorised and regulated by the Financial Conduct Authority in the United Kingdom.

France: State Street Global Advisors Ireland Limited, Paris branch is a branch of State Street Global Advisors Ireland Limited, registered in Ireland with company number 145221, authorised and regulated by the Central Bank of Ireland, and whose registered office is at 78 Sir John Rogerson's Quay, Dublin 2. State Street Global Advisors Ireland Limited, Paris Branch, is registered in France with company number RCS Nanterre 832 734 602 and whose office is at Immeuble Défense Plaza, 23-25 rue Delarivière-Lefoullon, 92064 Paris La Défense Cedex, France. T: (+33) 1 44 45 40 00. F: (+33) 1 44 45 41 92.

Germany: State Street Global Advisors GmbH, Brienner Strasse 59, D-80333 Munich. Authorised and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht ("BaFin"). Registered with the Register of Commerce Munich HRB 121381. T: +49 (0)89-55878-400. F: +49 (0)89-55878-440. ssga.com.

Hong Kong: State Street Global Advisors Asia Limited, 68/F, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. T: +852 2103-0288. F: +852 2103-0200.

Ireland: State Street Global Advisors Ireland Limited is regulated by the Central Bank of Ireland. Registered office address 78 Sir John Rogerson's Quay, Dublin 2. Registered number 145221. T: +353 (0)1 776 3000. Fax: +353 (0)1 776 3300. Web: ssga.com.

Italy: State Street Global Advisors Limited, Milan Branch (Sede Secondaria di Milano) is a branch of State Street Global Advisors Limited, a company registered in the UK, authorised and regulated by the Financial Conduct Authority (FCA), with a capital of GBP 62,350,000 and whose registered office is at 20 Churchill Place, London E14 5HJ. State Street Global Advisors Limited, Milan Branch (Sede Secondaria di Milano), is registered in Italy with company number 06353340968 - R.E.A. 1887090 and VAT number 06353340968 and whose office is at Via dei Bossi, 4 - 20121 Milano, Italy. T: 39 02 32066 100. F: 39 02 32066 155.

Netherlands: State Street Global Advisors Netherlands, Apollo Building, 7th floor Herikerbergweg 29 1101 CN Amsterdam, Netherlands. Telephone: 31 20 7181701. SSGA Netherlands is a branch office of State Street Global Advisors Limited. State Street Global Advisors Limited is authorised and regulated by the Financial Conduct Authority in the United Kingdom +65 6826-7501. Web: ssga.com.

Switzerland: State Street Global Advisors AG, Beethovenstr. 19, CH-8027 Zurich. Authorised and regulated by the Eidgenössische Finanzmarktaufsicht ("FINMA"). Registered with the Register of Commerce Zurich CHE-105.078.458. T: +41 (0)44 245 70 00. Facsimile Fax: +41 (0)44 245 70 16. ssga.com.

Singapore: State Street Global Advisors Singapore Limited, 168, Robinson Road, #33-01 Capital Tower, Singapore 068912 (Company Reg. No: 200002719D, regulated by the Monetary Authority of Singapore). T: +65 6826-7555. F: +65 6826-7501.

Important Risk Information

Marketing Communication. For Professional Client Use Only.

This document has been issued by State Street Global Advisors Limited ("State Street Global Advisors"). Authorised and regulated by the Financial Conduct Authority. Registered No. 2509928. VAT No. 5776591 81. Registered office: 20 Churchill Place, Canary Wharf, London, E14 5HJ. T: 020 3395 6000 F: 020 3395 6350

This material is general information only and does not take into account your individual objectives, financial situation or needs and you should consider whether it is appropriate for you.

The information provided does not constitute investment advice and it should not be relied on as such. It should not be considered a solicitation to buy or an offer to sell a security. It does not take into account any investor's particular investment objectives, strategies, tax status or investment horizon. You should consult your tax and financial advisor. All material has been obtained from sources believed to be reliable. There is no representation or warranty as to the accuracy of the information and State Street shall have no liability for decisions based on such information.

Exchange traded funds (ETFs) trade like stocks, are subject to investment risk and will fluctuate in market value. The value of the investment can go down as well as up and the return upon the investment will therefore be variable. Changes in exchange rates may have an adverse effect on the value, price or income of an investment. Further, there is no guarantee an ETF will achieve its investment objective.

The views expressed in this material are the views of SPDR ETF Strategy Team as of 28 September 2018 and are subject to change based on market and other conditions. This document contains certain statements that may be deemed forward-looking statements. Please note that any such statements are not guarantees of any future performance and actual results or developments may differ materially from those projected.

Past performance is not a guarantee of future results.

All forms of investments carry risks, including the risk of losing all of the invested amount. Such activities may not be suitable for everyone.

Equity securities may fluctuate in value in response to the activities of individual companies and general market and economic conditions.

Investments in emerging or developing markets may be more volatile and less liquid than investing in developed markets and may involve exposure to economic structures that are generally less diverse and mature and to political systems which have less stability than those of more developed countries.

There can be no assurance that a liquid market will be maintained for ETF shares.

Investing in foreign domiciled securities may involve risk of capital loss from unfavourable fluctuation in currency values, withholding taxes, from differences in generally accepted accounting principles or from economic or political instability in other nations.

Standard & Poor's, S&P and SPDR are registered trademarks of Standard & Poor's Financial Services LLC (S&P); Dow Jones is a registered trademark of Dow Jones Trademark Holdings LLC (Dow Jones); and these trademarks have been licensed for use by S&P Dow Jones Indices LLC (SPDJI) and sublicensed for certain purposes by State Street Corporation. State Street Corporation's financial products are not sponsored, endorsed, sold or promoted by SPDJI, Dow Jones, S&P, their respective affiliates and third party licensors and none of such parties make any representation regarding the advisability of investing in such product(s) nor do they have any liability in relation thereto, including for any errors, omissions, or interruptions of any index.

Concentrated investments in a particular sector or industry tend to be more volatile than the overall market and increases risk that events negatively affecting such sectors or industries could reduce returns, potentially causing the value of the Fund's shares to decrease.

All the index performance results referred to are provided exclusively for comparison purposes only. It should not be assumed that they represent the performance of any particular investment.

The whole or any part of this work may not be reproduced, copied or transmitted or any of its contents disclosed to third parties without State Street Global Advisor's express written consent.

Bonds generally present less short-term risk and volatility than stocks, but contain interest rate risk (as interest rates raise, bond prices usually fall); issuer default risk; issuer credit risk; liquidity risk; and inflation risk. These effects are usually pronounced for longer-term securities. Any fixed income security sold or redeemed prior to maturity may be subject to a substantial gain or loss.

The trademarks and service marks referenced herein are the property of their respective owners. Third party data providers make no warranties or representations of any kind relating to the accuracy, completeness or timeliness of the data and have no liability for damages of any kind relating to the use of such data.

© 2019 State Street Corporation. All Rights Reserved.

ID1617222263677.1.APAC.INST Exp. Date 31/03/2020

STATE STREET GLOBAL
ADVISORS
SPDR[®]

spdrs.com/fixedincome