



# **Passive funds and market stability**

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**SUERF – UniCredit Foundation Workshop**

**Passive vs Active Asset Portfolio Management: Trends, Drivers, Risks**

February 19, 2020, Milan, Italy

The views expressed here do not necessarily represent those of the BIS

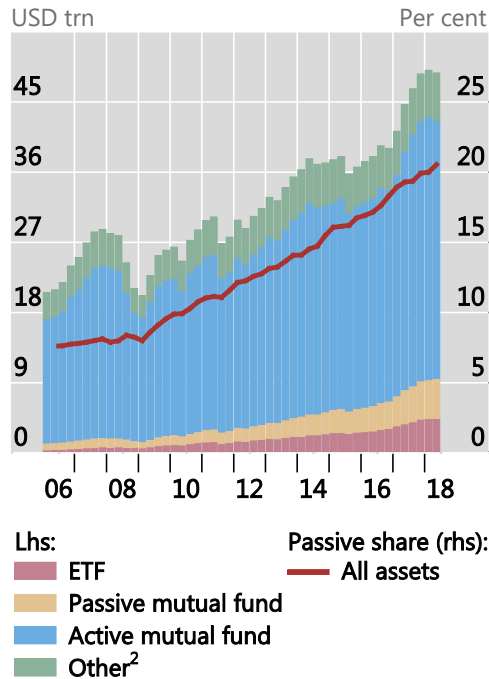
## Passive investing – definition and key issues

- Passive investing is a strategy that **tracks the returns of a price index** (such as an established market benchmark)
  - No trading in the absence of changes in index composition
  - Passive label refers to the *investment approach of the fund manager* – end-investor strategies can differ
- Relative cost, performance and diversification of passive funds are key considerations for individual investors
- Effects of passive portfolio management on **securities market efficiency and stability** have been increasingly debated

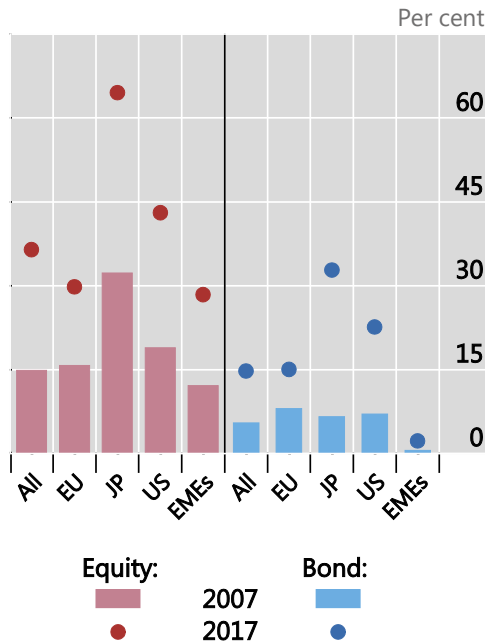
# The rise of passive investing – funds view

## Passive funds' share of the fund management sector rises

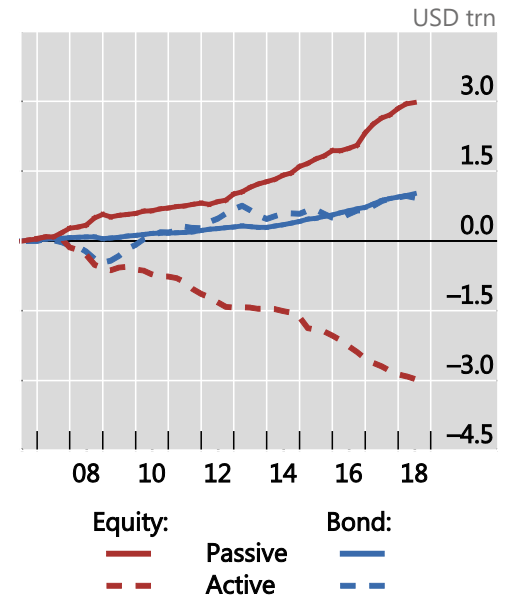
Global assets under management by fund type



Passive funds' share of investment fund assets, by geographical focus<sup>1</sup>



Cumulative fund flows



<sup>1</sup> As of end-June for each year. <sup>2</sup> Includes investment fund assets of closed-end funds, hedge funds, insurance funds, investment trusts and pension funds.

Sources: Lipper; authors' calculations.

# Passive funds' share of outstanding market volume<sup>1</sup>

In per cent		
Securities market	2007	2017
Equities <sup>2</sup>		
Europe	2.3	3.3
Japan	2.0	5.5
United States	6.0	14.7
EMEs	1.2	2.3
Bonds <sup>3</sup>		
Europe	1.0	0.9
United States	1.2	4.5

<sup>1</sup> End-June data for each year. <sup>2</sup> Equity market capitalisation (denominator) based on Bloomberg World Market Capitalization indices (WCAUJAPA for Japan, WCAUUS for US, and constituent countries for Europe and EMEs). <sup>3</sup> Bond market capitalisation (denominator) based on Bloomberg Barclays Pan-European Aggregate, Bloomberg Barclays Pan-European High Yield, Bloomberg Barclays US Corporate High Yield and US Aggregate Bond Indices (LP06TREU, LP01TREU, LF98TRUU and LBUSTRUU respectively).

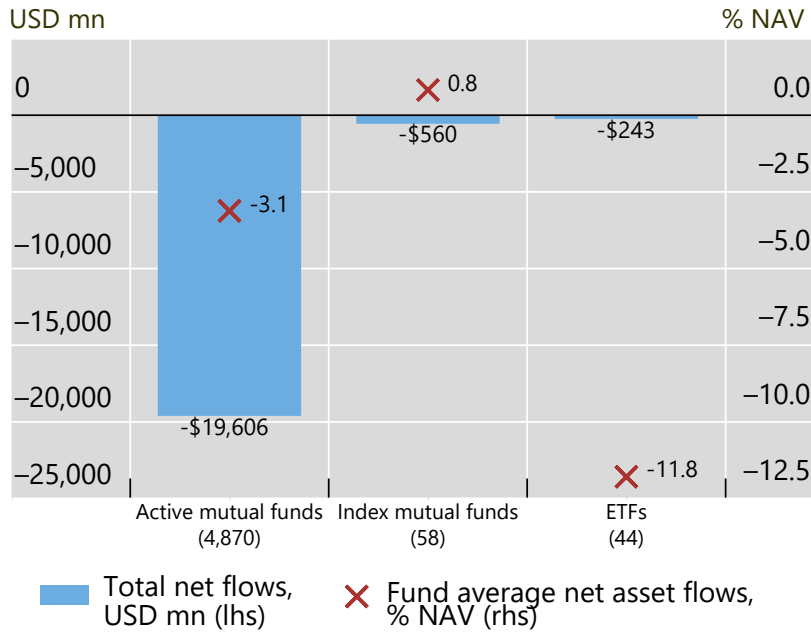
Sources: Bloomberg; Lipper; authors' calculations.

## Behaviour of investors in passive funds

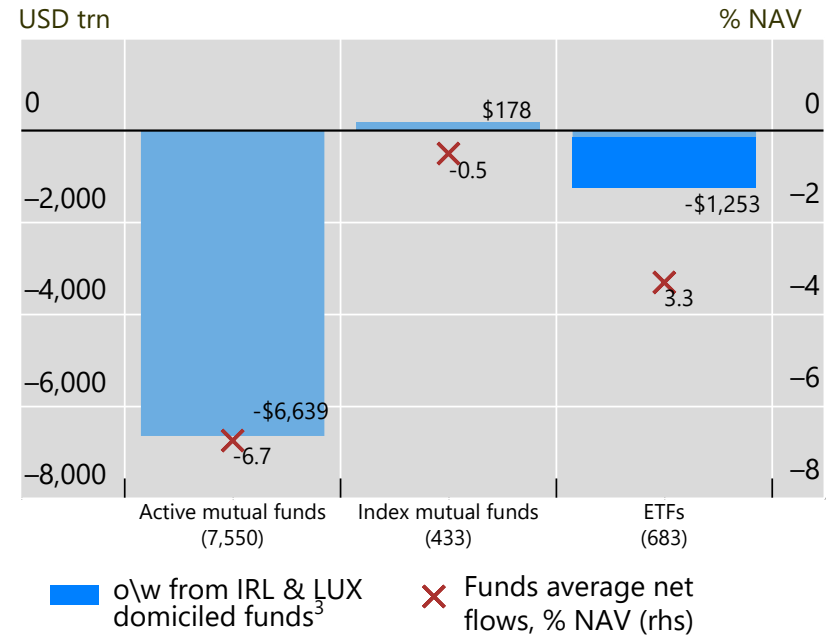
- Reasons to believe that **index funds** are being used in a more stable way by their investors
  - Preferred by “buy-and-hold” investors to minimise costs, also institutional users that do not want to trade because of rigid investment mandates or for tax reasons
  - Absence of discretion might make investors less inclined to shift balances in response to fund performance
- BUT...**ETFs** – an index-tracking product enabling frequent low-cost trading – could engender different behaviour
  - .. and leveraged ETFs can amplify market moves even in the absence of fund inflows/outflows

# EME-focused fund flows in select stress episodes

EME bond funds, net flows, June 2013<sup>1</sup>



EME equity funds, net flows, August 2015<sup>1,2</sup>



<sup>1</sup> Number of unique funds in parentheses. <sup>2</sup> 8 out of 691 EME-focused ETFs not index-tracking, hence not included. <sup>3</sup> Net flows of Ireland (IRL) and Luxembourg (LUX) domiciled EME-focused equity ETFs; 151 funds in total.

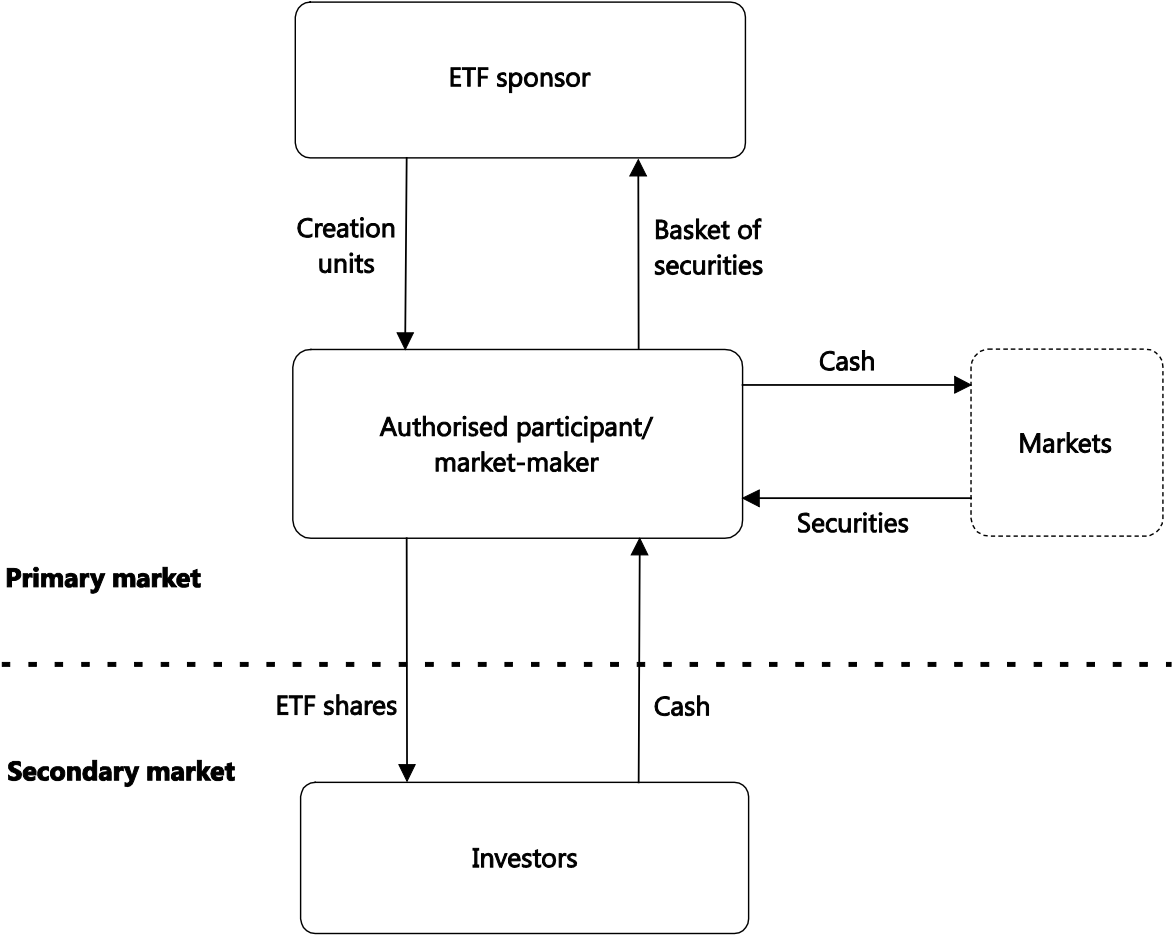
Sources: Lipper; BIS calculations.

## Key features of ETFs

- **Index tracking**
  - diversification and low investment costs
- **Traded on secondary markets**
  - intraday trading/short sales
  - secondary-market arbitrage
- **Primary-secondary market trading mechanism**
  - intermediation undertaken by authorized participants (APs)

**Value proposition:** near immediate liquidity at a price that is in line with the value of the securities portfolio it is tracking

# Mechanics of share creation process for a physical ETF

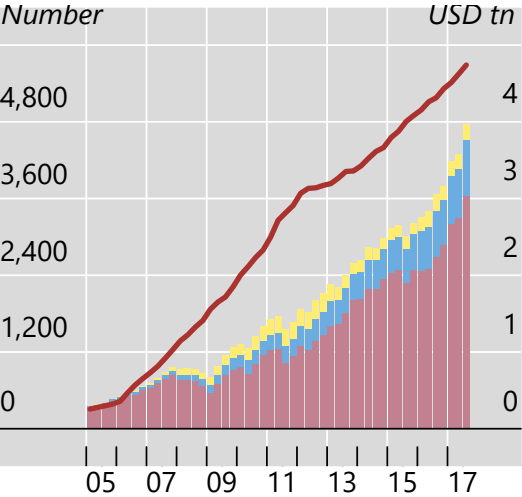


Source: Ramaswamy (2011).



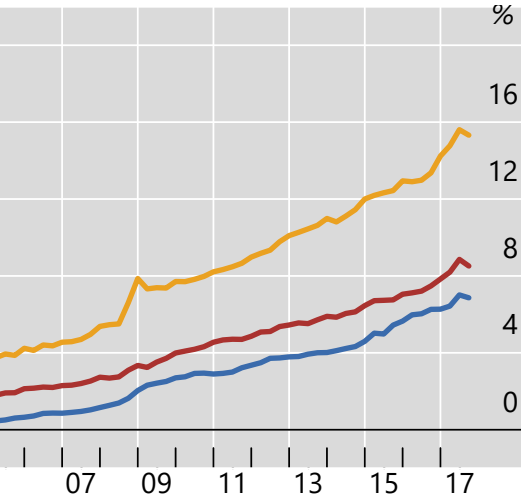
# ETF market size and composition

ETF global market size



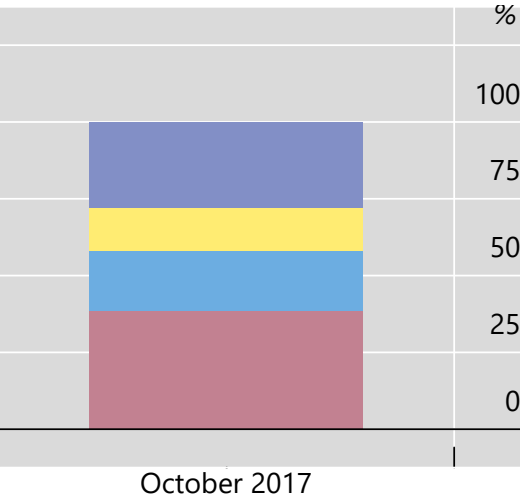
Lhs: — Number of ETFs  
 Rhs: — Equity — Bond — Other

ETF share of fund assets



— All assets — Bond — Equity

Market share by ETF sponsor



— iShares — SPDR ETFs  
 — Vanguard — Other

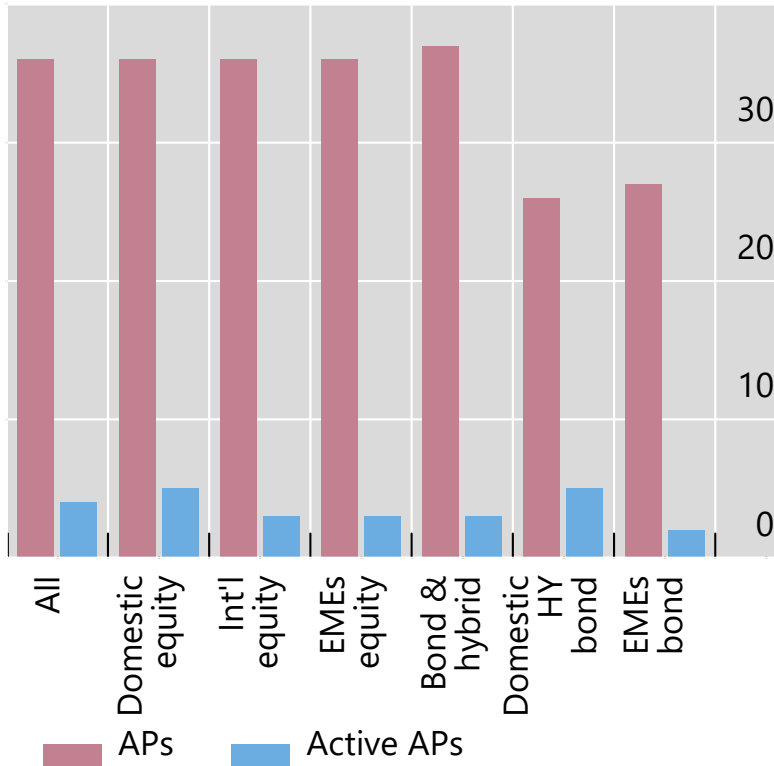
Sources: Lipper; [www.etfgi.com](http://www.etfgi.com); BIS calculations.

# Impact of ETF trading on underlying securities prices

- Two channels:
  - Arbitrage via **creation/redemption by APs** (primary AND secondary market)
  - Taking long/short positions in ETF shares and underlying securities in the **secondary market**
- APs there more to step-in in cases of substantial NAV deviations, but can be largely absent otherwise
- Demand shocks in ETFs can be transmitted to underlying securities without generating any fund flows, but solely via secondary market trading

# ETF authorized participants

Median number of APs in ETFs



Sources: BlackRock; ICI.

List of common APs (based on 2016 activity)

## US

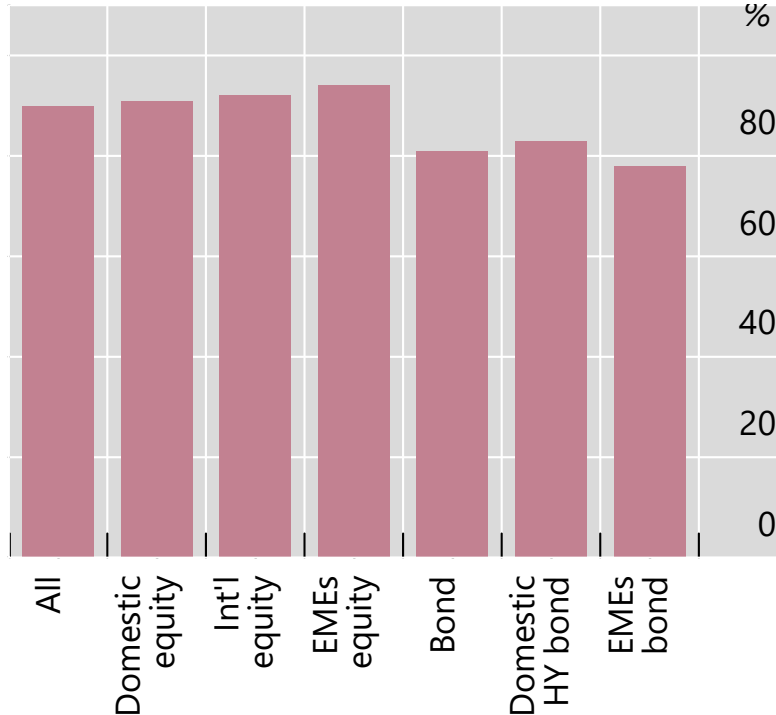
BoA ML  
 Citigroup  
 Credit Suisse  
 Deutsche Bank  
 Goldman Sachs  
 Jefferies  
 JP Morgan  
 KCG  
 Morgan Stanley  
 UBS Securities  
 Virtu

## Europe

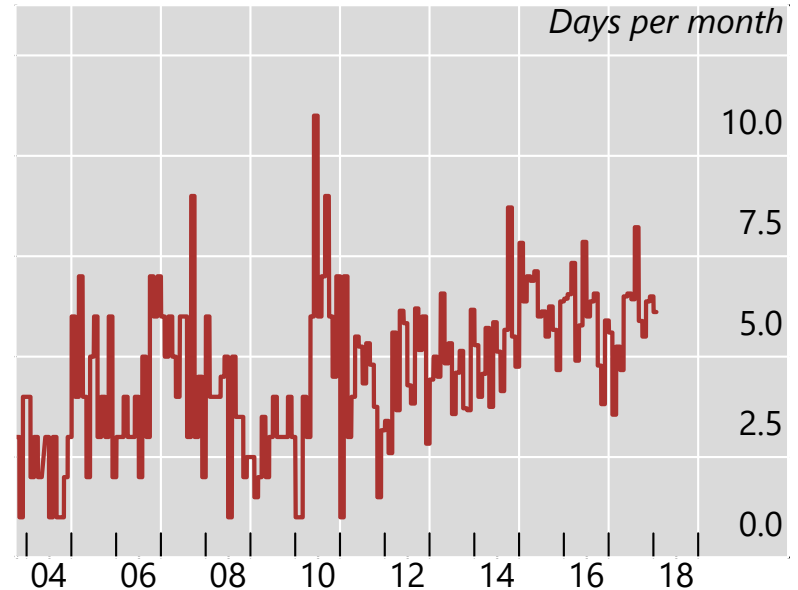
BoA ML  
 Bluefin Europe  
 BNP Paribas  
 Citigroup  
 Commerzbank  
 Deutsche Bank  
 Flow Traders  
 Goldman Sachs  
 Jane Street  
 Societe Generale  
 Susquehanna Int. Sec.  
 UBS

# ETF secondary and primary market trading activity

Secondary market trading/total trading<sup>1</sup>



Frequency of bond ETF share creation/redemption<sup>2</sup>



<sup>1</sup> January 2013-June 2014. <sup>2</sup> Based on the average number of days of the 12 ETFs with the Barclays US Aggregate Bond Index as their benchmark.

Sources: ICI; Bloomberg; Lipper; author calculations.

# ETF trading footprint is greater than size footprint

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## ETF share of index constituency, Jan-Feb 2018

<b>ETFs tracking:</b>	<b>S&amp;P500</b>	<b>Eurostoxx50</b>
Market capitalization	2.3	1.7
Turnover	19.9	4.6
<i>Memo:</i>		
Turnover, week 5-6 Feb	30.4	8.1

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Notes: Daily shares over January-February 2018. Includes only ETFs tracking the index. Index constituencies will also be held and traded by ETFs tracking other indices.

Sources: Bloomberg; Thomson Reuters Eikon; author calculations

## ETF intermediation impairment

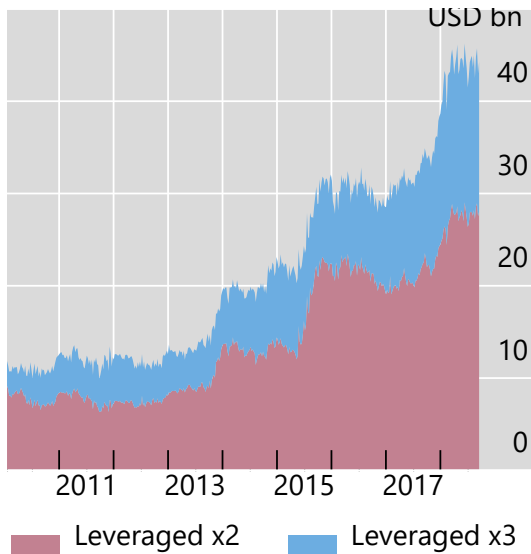
- **AP balance sheet/risk constraints** or conflicting incentives
  - In few cases of AP pullback so far, others have stepped in
- Fund would **trade temporarily as a closed-end fund**
  - investors would need to accept a NAV discount (or premium)
  - ETFs share trading can act as shock absorber in stress periods, Blackrock (2018)
- However, a large NAV basis or trading halts might have **knock-on price and liquidity effects** if they act as a negative signal for investors – the “billboard effect”
- **Reliability of PTFs** as key intermediaries (APs or OLPs)?

## Leveraged ETFs

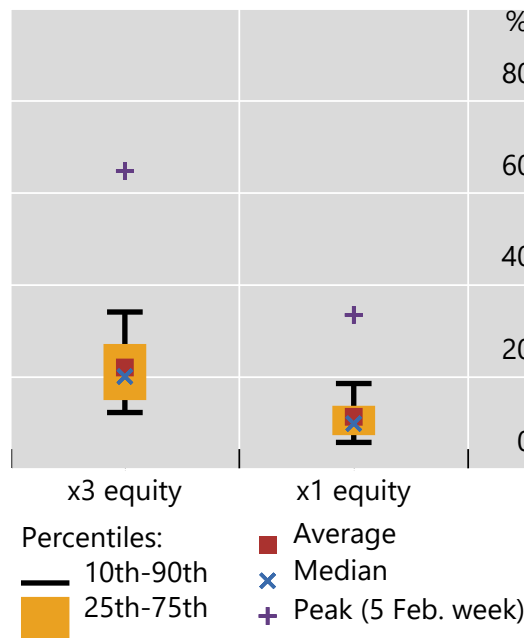
- Small share compared to ETF market (about 1%)
- Use derivatives, such as futures, to **deliver multiples of index returns**
- To maintain target leverage, **trade in the same direction as market moves** even in the absence of inflows/outflows

# Leveraged and inverse ETPs: size and trading footprint

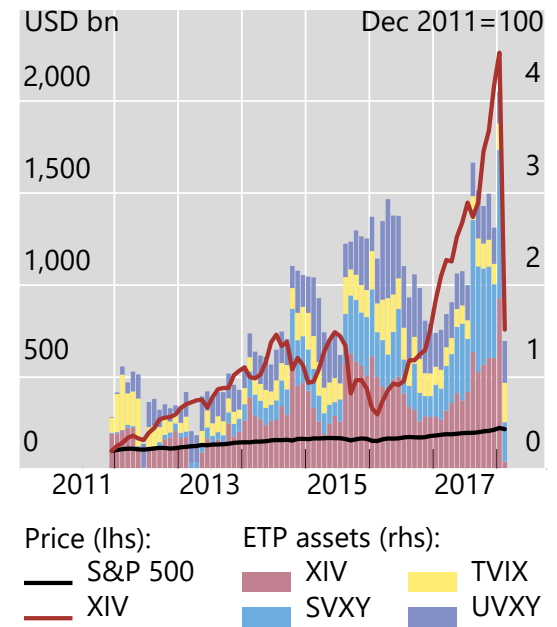
Leveraged equity ETFs  
 ≈1% of ETF market!



Trading of leveraged and non-leveraged equity ETFs<sup>1</sup>



Volatility ETPs  
 ≈0.1% relative to ETFs!



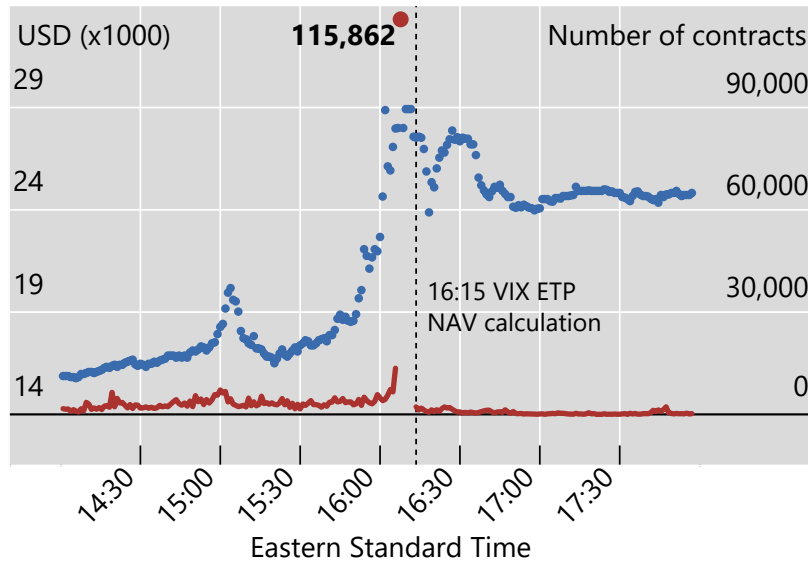
<sup>1</sup> Daily traded dollar volume (turnover) divided by total assets; 2015-17. Equity x1 is the US SPDR S&P500, equity x3 is the ProShares UltraPro S&P500.

Sources: US Commodity Futures Trading Commission; Bloomberg; EPFR; BIS calculations.



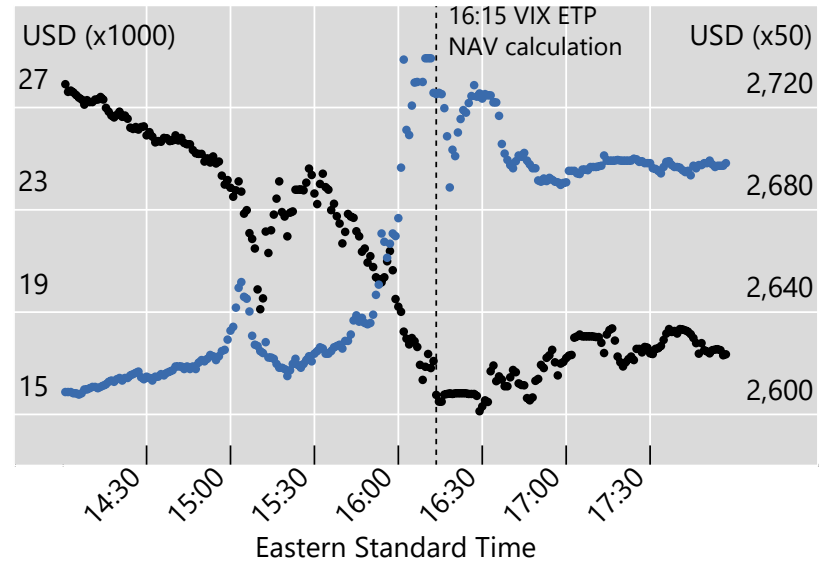
# 5 February developments in VIX futures market and spillovers to equity futures

VIX futures prices and rebalancing by volatility ETPs



• VIX futures price, March contract (lhs) Rhs: — Trading volume

Volatility futures price leads equity futures



• S&P 500 futures price, E-mini

Sources: Thomson Reuters Tick History; BIS calculations.

## Issues for regulators

- **Passive mutual funds** may affect informational efficiency, but little financial stability implications
- **ETFs** may have both efficiency and financial stability implications
  - *Opaqueness* of APs, OLPs, other market-maker and arbitrageur relationships
  - Relative importance of the *two arbitrage channels* unclear
  - *Regulatory framework designed for other vehicles*: in the US, legal basis in the 1940's ICA (SEC exemptions + stock exchange listing rules)
  - No regulation requiring ETFs to trade close to NAV, yet eg MiFID II definition presumes trading close to NAV

**Leveraged & inverse ETPs:** a whole different animal

## Issues for regulators

- “Reliance on market willingness in a structure which is so reliant on AP functioning is an unenviable positions for regulators to be in” *Central Bank of Ireland, 2018*
- ETFs should enjoy independent legal status as “any publicly traded pooled investment vehicle that relies on a creation and redemption-based arbitrage mechanism”, H Hu & J Morley in *Southern California Law Review, July 2019.*
- **The 2019 US ETF Rule:** more consistent ETF regulatory approach to replace “patchwork” of exemptive orders; includes also:
  - Disclosure of portfolio holdings, historical NAV deviations, etc
  - Custom creation/redemption baskets made easier

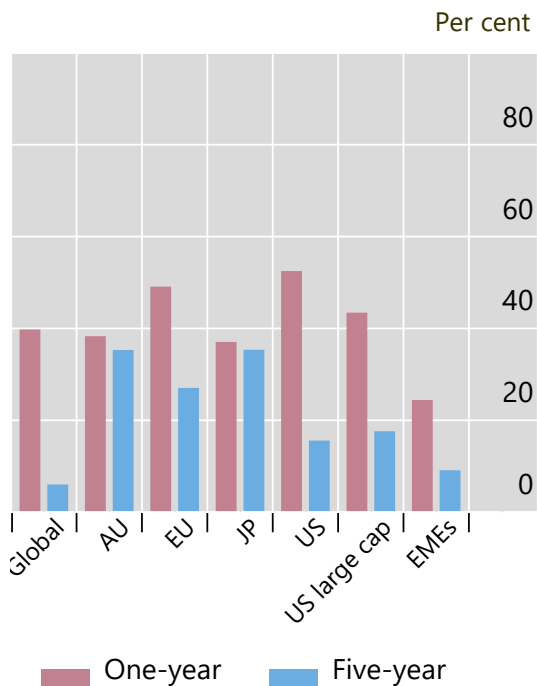
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- Central Bank of Ireland, 2018, Feedback Statement on DP6 – Exchange Traded Funds and Consultation Paper
- Hu H and J Morley, 2019, "The SEC and regulation of exchange-traded funds: a complementary start and a welcome invitation," *Southern California Law Review*, 92(5), July
- Sushko, V and G Turner, 2018, "The implications of passive investing for securities markets," *BIS Quarterly Review*, March.
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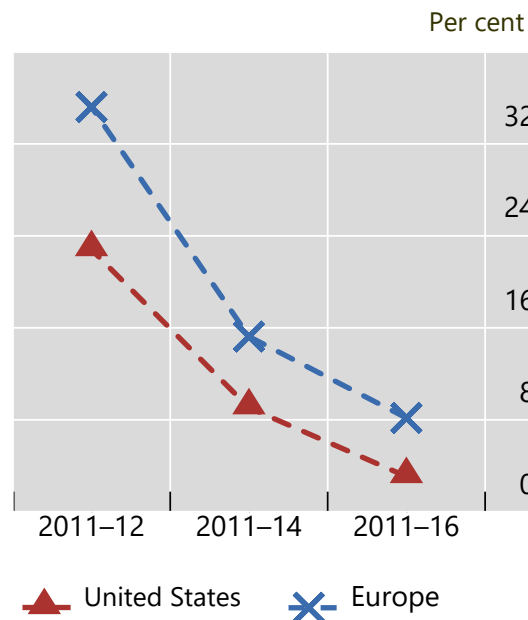
# Appendix

# Active funds underperform despite higher fees

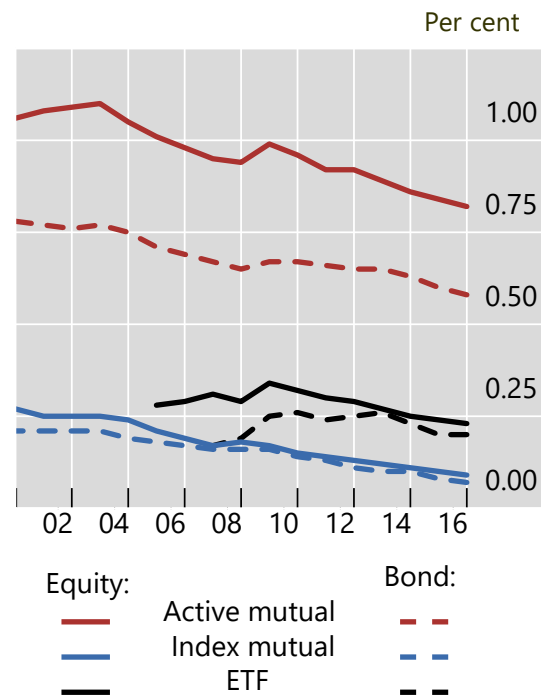
Equity funds beating their benchmark<sup>1</sup>



Persistence of equity fund outperformance<sup>2</sup>



US funds' expense ratios<sup>3</sup>

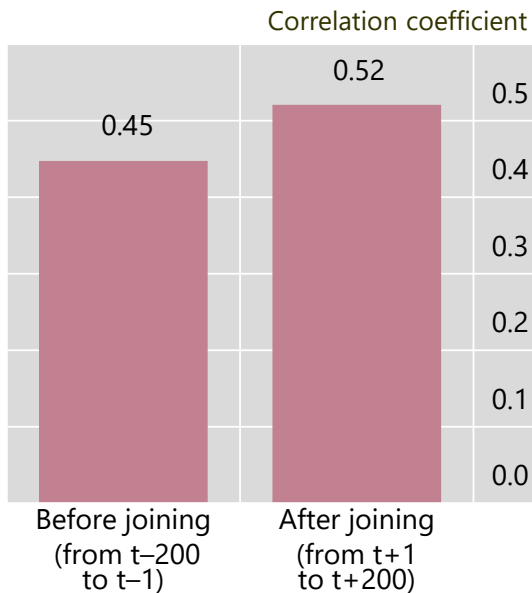


<sup>1</sup> For Global, S&P Global 1200; for AU, S&P/ASX 200; for EU, S&P Europe 350; for JP, S&P Japan 500; for US, S&P Composite 1500; for US large cap, S&P 500; for EMEs, S&P/IFCI. For illustrative purposes only; individual active funds may have different benchmarks. Data as of 30 June 2017. <sup>2</sup> Share of active funds outperforming their benchmark during the corresponding periods. <sup>3</sup> Asset-weighted averages.

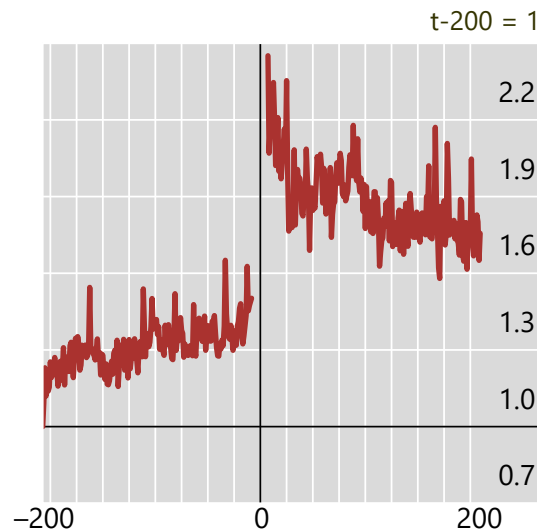
Sources: Investment Company Institute; Lipper; S&P Dow Jones Indices; authors' calculations.

# S&P500 inclusion raises correlation & improves liquidity<sup>1</sup>

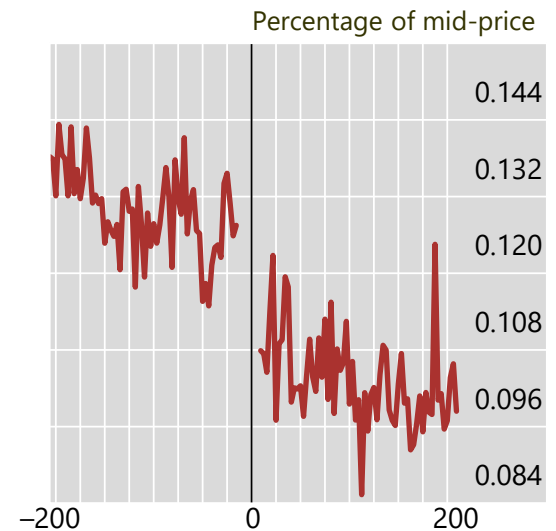
Correlation with the S&P 500 index<sup>2</sup>



Daily trading volume



Bid-ask spread

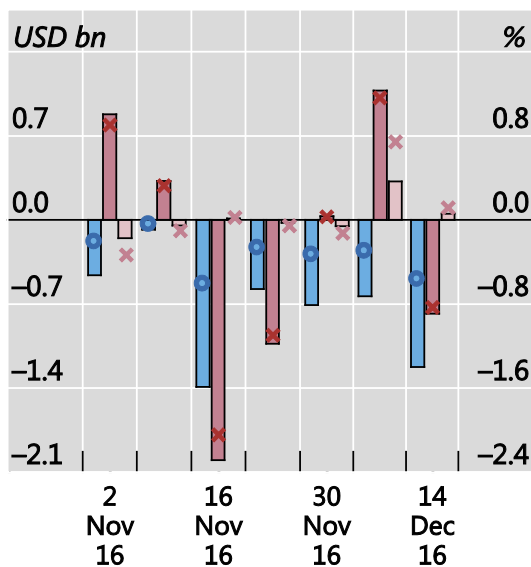


<sup>1</sup> Sample based on 462 stocks joining the S&P 500 between January 2000 and September 2017. Stocks subject to mergers and acquisitions, stocks with poor data availability and those that have left the index during the first 30 days after the inclusion date are excluded. t=0 is the index inclusion date specific to each stock. <sup>2</sup> Correlation of daily returns with the S&P 500 index.

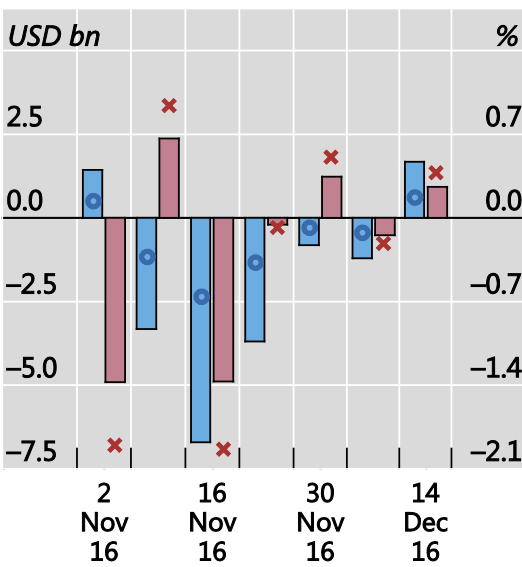
Sources: Bloomberg; Thomson Reuters Eikon; authors' calculations.

# ETF flows were volatile post 2016 US presidential elections

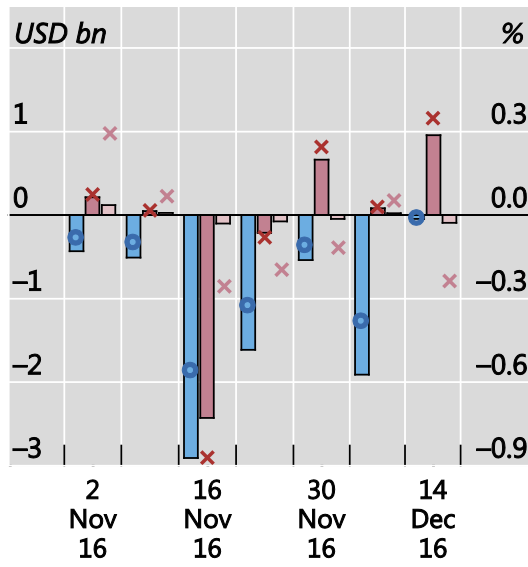
AEs government bonds



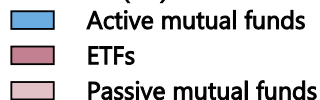
EMEs, corporate and HY bonds



EME equities



Net flows (lhs):



Net flows to total net assets (rhs):



Sources: EPFR; author calculations.

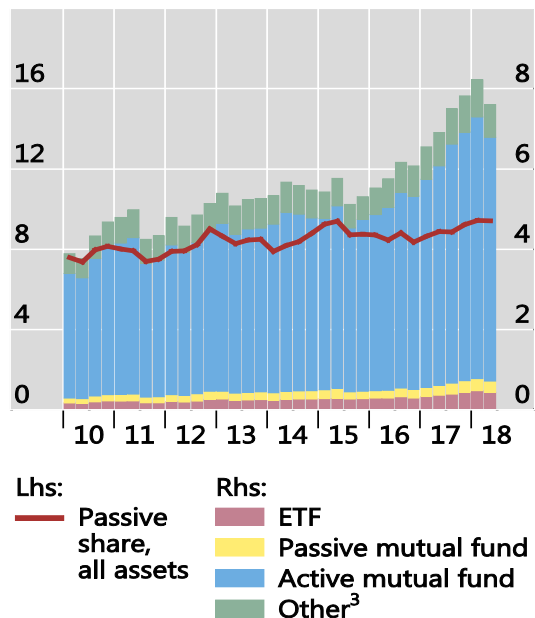
- Active mutual funds exhibited persistent outflows, consistent with well-established positive flow-performance relationship.



# EME focused funds, index weights, and August 2018 fund flows

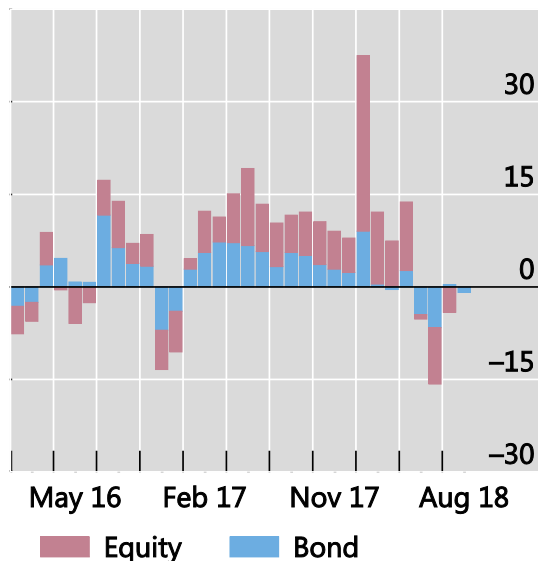
Assets under management of EME focused investment funds<sup>1</sup>

Per cent (Lhs) USD trn (Rhs)

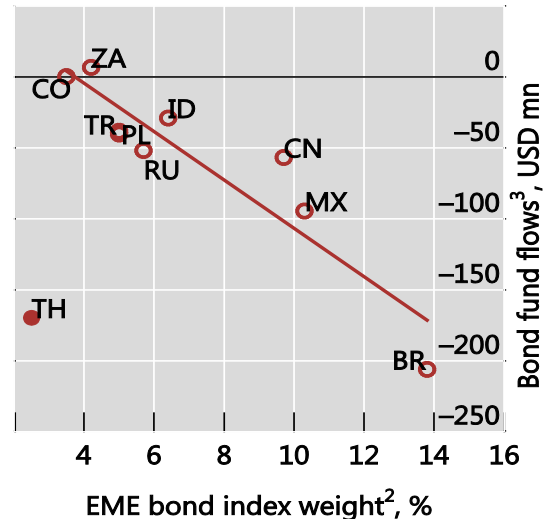


Mutual fund flows to EMEs<sup>2</sup>

USD bn



Country weight in EME bond indices and bond fund outflows<sup>4</sup>



<sup>1</sup> Excludes the share of assets of investment funds with “global” geographic focus allocated to EMEs. <sup>2</sup> Monthly sums of weekly data across EMEs. Data cover net portfolio flows (adjusted for exchange rate changes) to dedicated funds for individual EMEs and to EME funds with country/regional decomposition. <sup>3</sup> Includes investment fund assets of closed-end funds, hedge funds, insurance funds, investment trusts and pension funds. <sup>4</sup> Fitted line excludes TH. Indexes include the JPMorgan Emerging Market Bond Index Global (EMBIG), the JPMorgan Corporate Emerging Markets Bond Index (CEMBI), the JPMorgan Government Bond Index-Emerging Markets (GBI-EM), and the JPMorgan EURO EMBIG; data as of end-2017. Data from 1 Aug to 14 Aug 2018.

Sources: EPFR; Lipper; authors’ calculations.

## ETFs: some differences between US and Europe

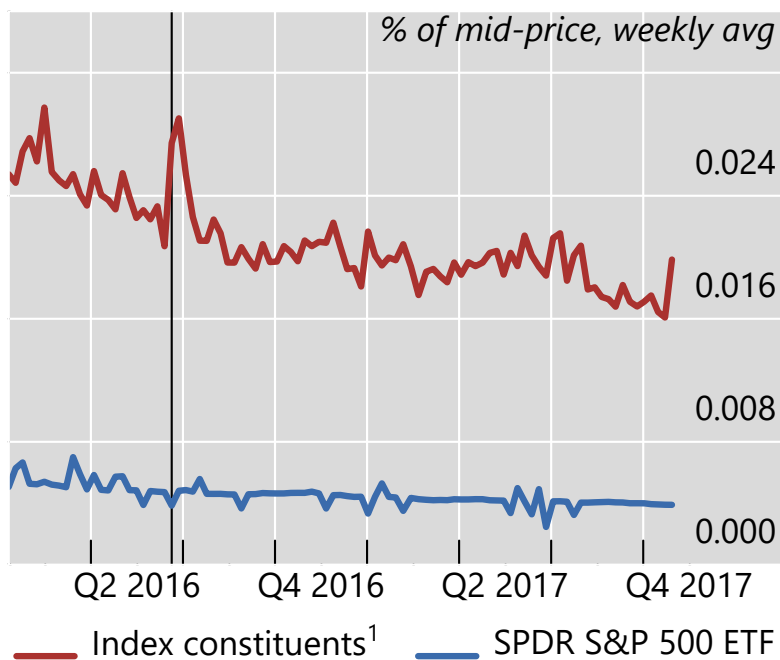
	United States	European Union
Legal basis	Investment Company Act of 1940: open-ended funds or UITs; 2019 ETF Rule	UCITs, treated similar to mutual funds
Secondary market trading	Predominantly exchange-traded	Predominantly OTC
Investor base	Retail is significant	Mostly institutional
Basket replication	Physical	Mostly physical, but synthetic about 20% and declining

## ETFs and liquidity

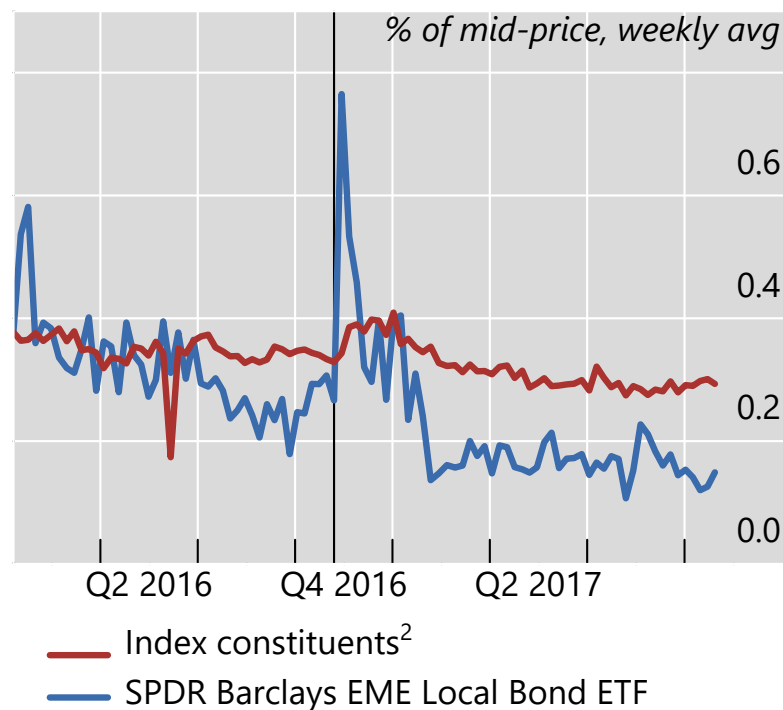
- Near-immediate liquidity at a share price close to NAV
- Basket trading by APs can improve bond market liquidity
- Can aid price discovery in illiquid or less accessible markets
- Unlike open-end mutual funds, cost of liquidity borne by market intermediaries (APs)

# ETF liquidity (bid-ask spreads)

US equities



EMEs local currency bonds



The vertical lines indicate UK referendum on 23 June 2016 (left panel) and US presidential election on 9 November 2016 (right panel).

<sup>1</sup> S&P 500 Index, as of 31 October 2017. <sup>2</sup> Barclays EMEs LOC Liquid Government Index, as of 30 October 2017

Sources: State Street Global Advisors SPDR; Thomson Reuters Eikon; author calculations.

# ETF trading is correlated with risk measures

ETF variable:	Correlation with:	
	VIX Index	MOVE Index
	Major equity ETF	Major bond ETF
NAV basis	-0.055***	-0.145***
Bid-ask spread	0.284***	n.a.
Fund flows, % assets	-0.0918***	-0.0537*
Absolute fund flows, % assets	0.218***	0.0306
Turnover, % assets	0.717***	0.209***
Absolute fund flows, % S&P500 turnover	0.060*	n.a.
Turnover, % S&P500 turnover	0.666***	n.a.

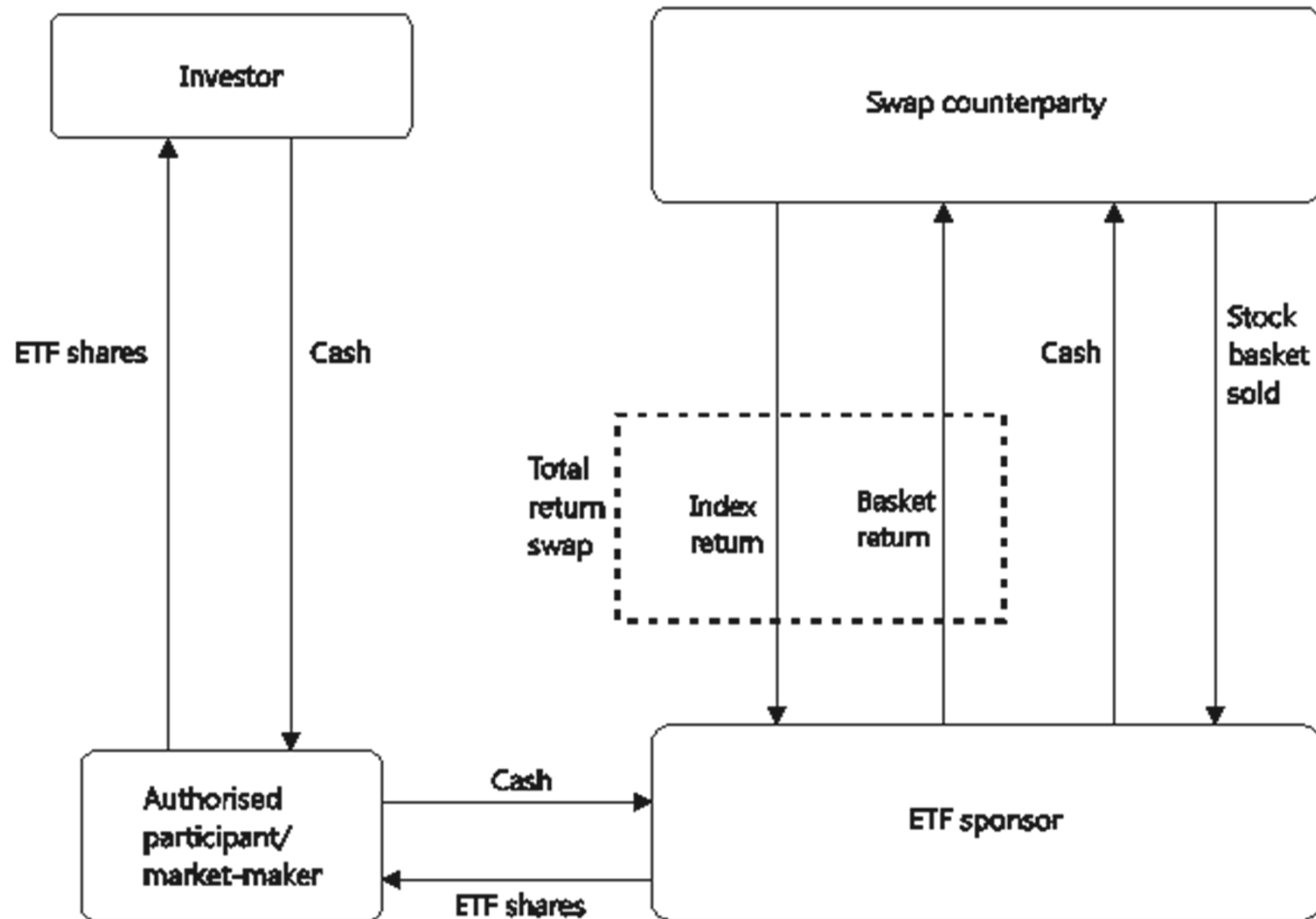
Notes: Pearson correlation coefficient. Based on daily data over 2013-February 2018, except for bid-ask spread and variables expressed as a % of S&P 500 turnover, which commence at the start of 2015.

\*\*\*/\*\*/\* denote results at significance levels of 1/5/10%, respectively.

The major equity ETF is SPDR S&P 500 ETF; the major bond ETF is the iShares Core US Aggregate Bond ETF.

Sources: Bloomberg; Thomson Reuters Eikon; author calculations

# Mechanics of share creation process for a synthetic ETF



# Counterparty and collateral risks

- **Swap counterparties in synthetic ETFs**

- Mkt value of collateral may not cover all the losses
- But, swap transactions tend to be over-collateralised
- Related-party lending and conflicts of interest (issue for Europe)

- **Securities lending by physical ETFs**

- Yield-enhancing, can offset management fees
- Risk of shortage if ETFs need to recall to meet large redemptions
- Blackrock (2013) explains that it first re-allocates securities from other ETFs before recalling secured loans from the borrower
- Value of collateral typically exceeds the value of the loan