



Guide to ETFs

U.S. | 4Q 2025
As of October 31, 2025





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ETF Trading Best Practices

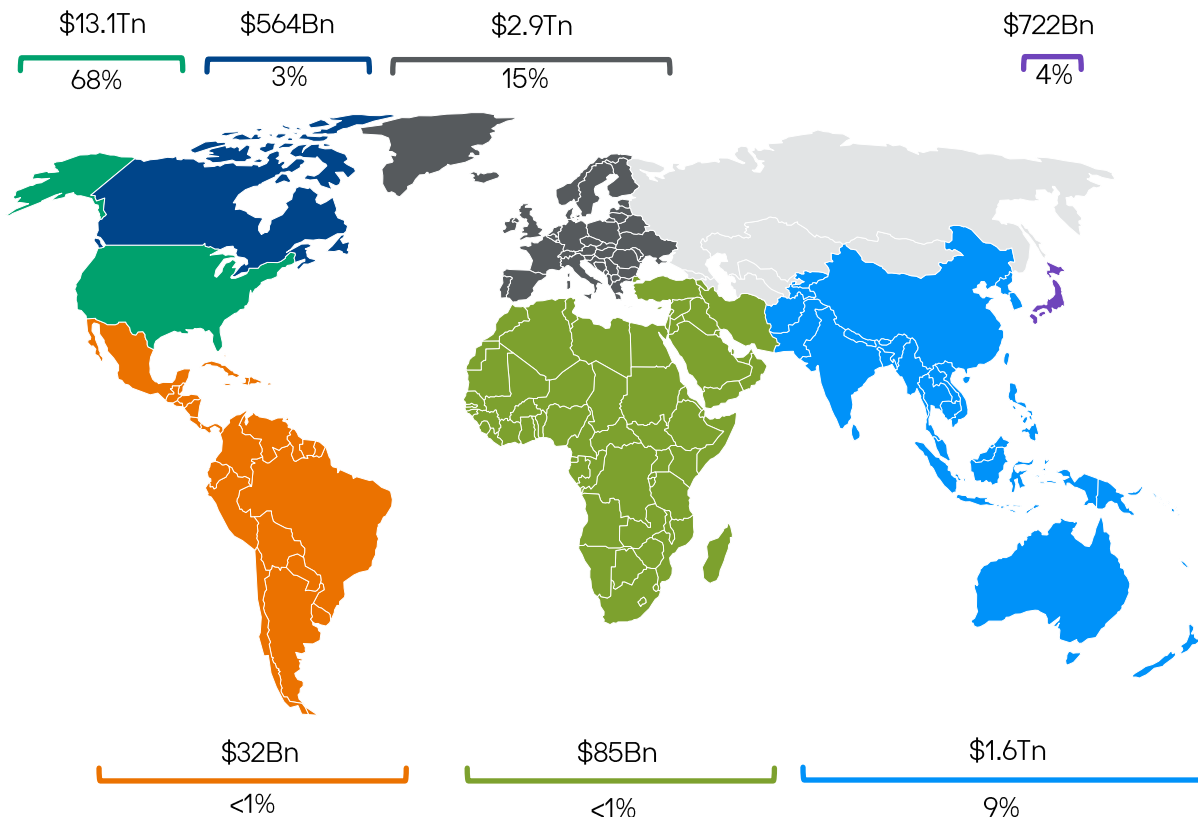
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Global ETF AUM by region

GTE U.S. 3

U.S. market represents about 70% of the global ETF landscape.



2025 ETF landscape

No. of ETFs ~13,400

ETF assets ~\$19.1Tn

Net flows ~+\$1.71Tn

15 years of consecutive net flows

Source: Bloomberg, J.P. Morgan Asset Management. Provided for information only to illustrate macro trends, not to be construed as offer, research or investment advice. Assets are represented by ETFs across countries of domicile in USD. Global consists of Australia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Egypt, Finland, France, Germany, Guernsey, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Japan, Luxembourg, Malaysia, Mauritius, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Saudia Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, UAE, United States and Vietnam.

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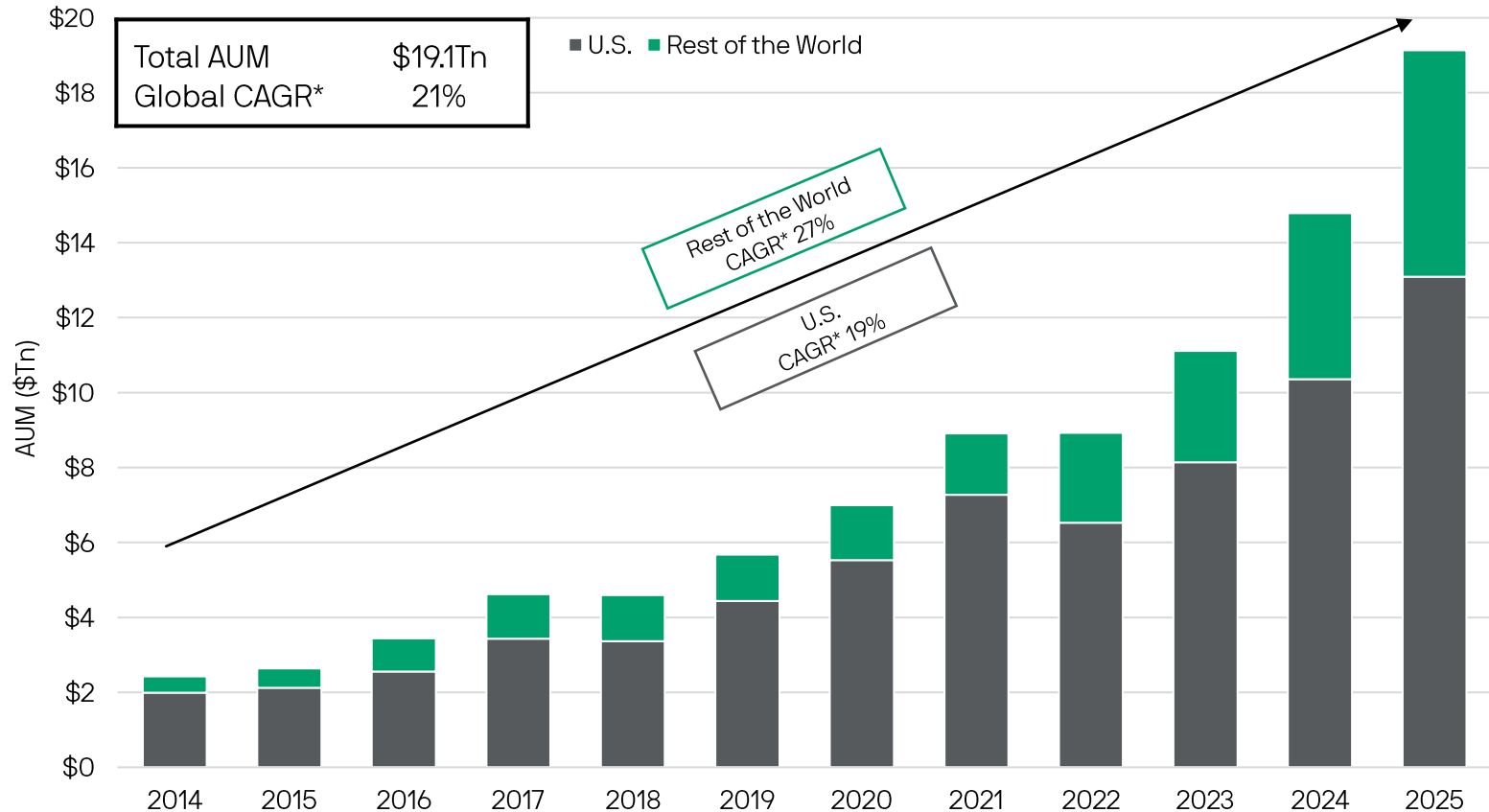


Global ETF AUM growth over time

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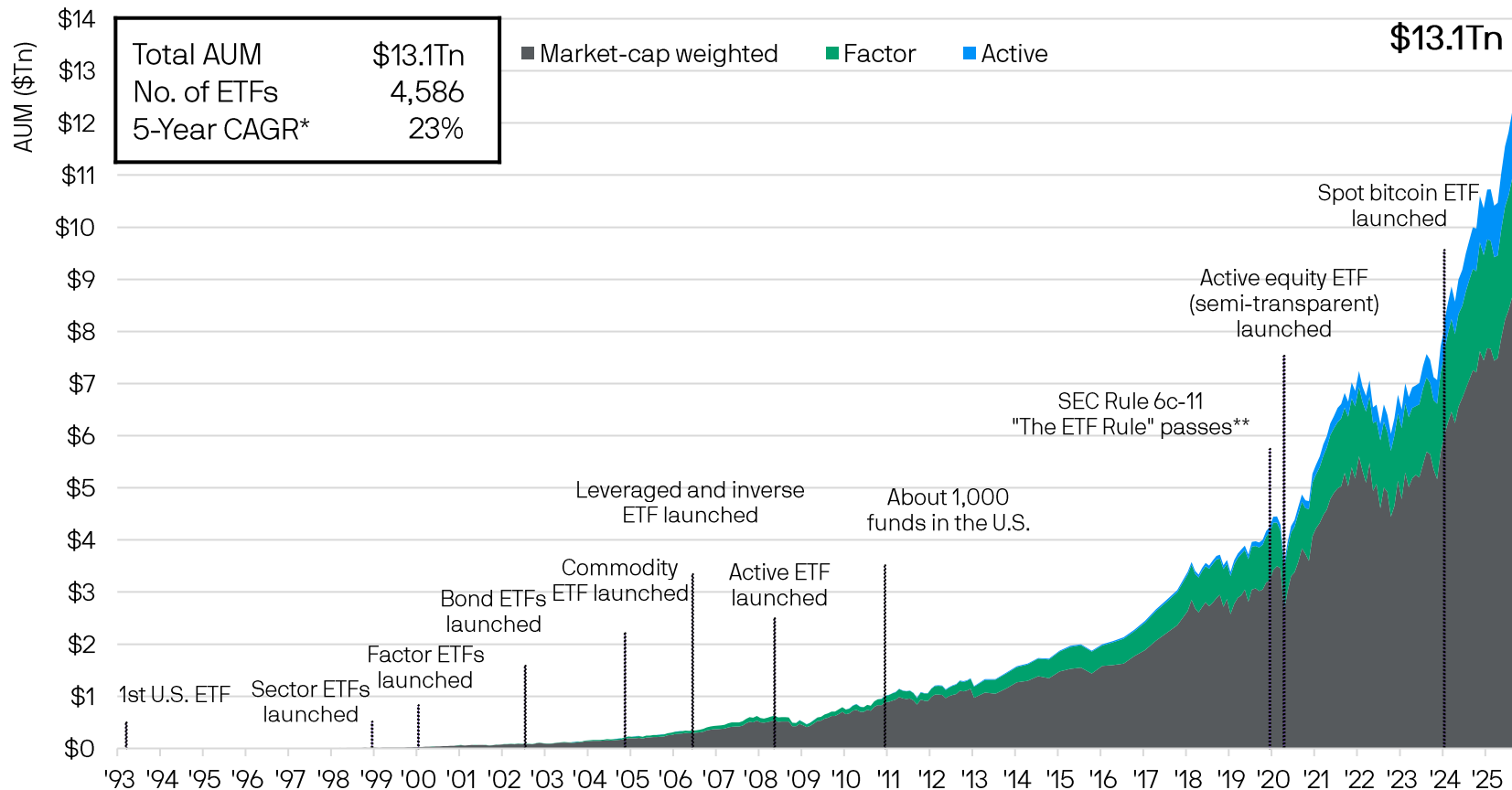
Source: Bloomberg, J.P. Morgan Asset Management. Rest of the world consists of Australia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Egypt, Finland, France, Germany, Guernsey, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Japan, Luxembourg, Malaysia, Mauritius, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, UAE and Vietnam. *Compound annual growth rate (CAGR).

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U.S. ETF market milestones

ETF assets have grown significantly over the past two decades.
U.S. ETF AUM (\$Tn)



Source: Bloomberg, J.P. Morgan Asset Management. *Compound annual growth rate (CAGR). **The ETF Rule, passed in 2019 modernized regulation of ETFs as open-ended funds by establishing clear and consistent framework for most ETFs across both index and actively managed strategies, enabling ETF issuers to bring new strategies to market, and permitting "custom in-kind" creation and redemption baskets to be available for all types of covered ETFs under the new regulation.
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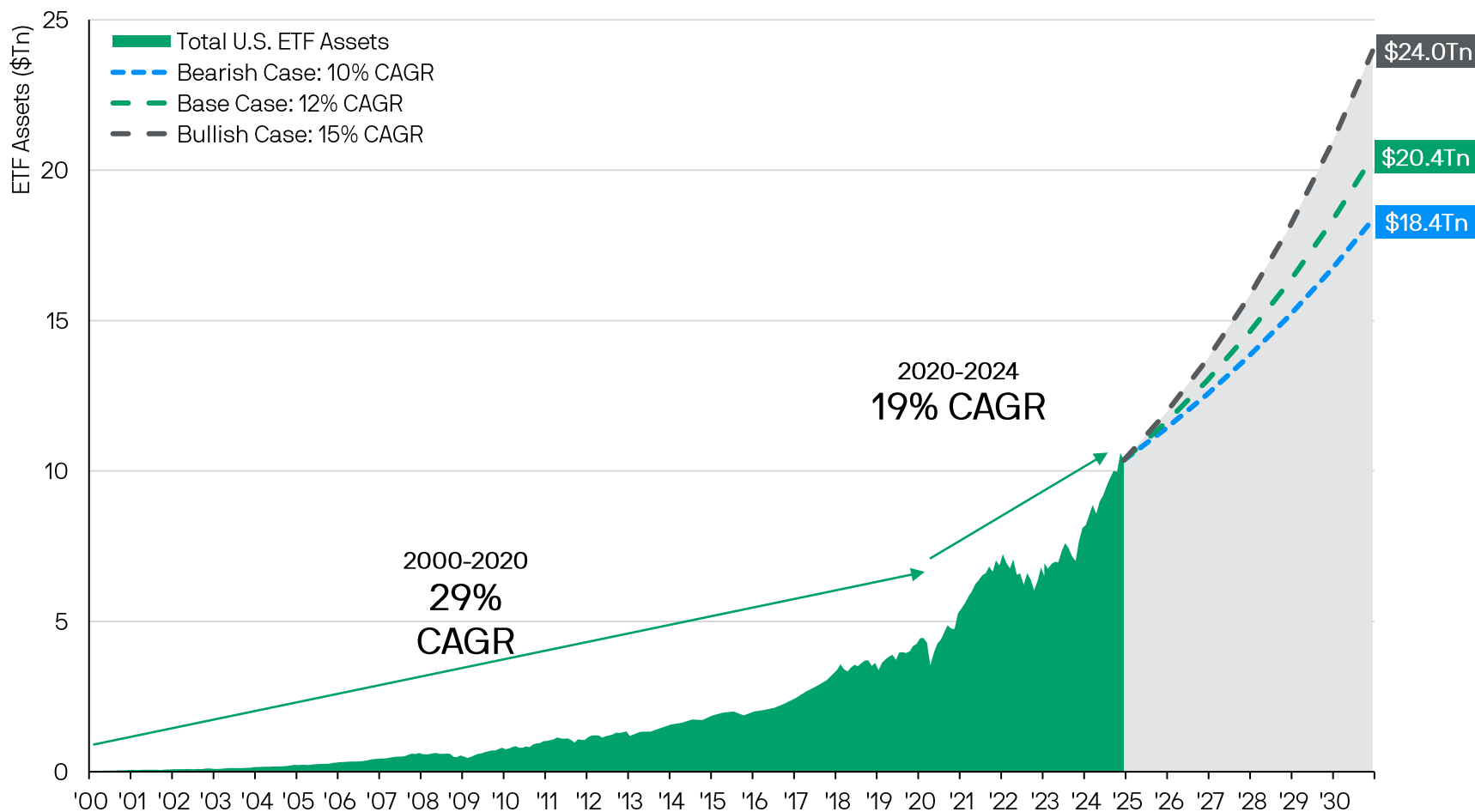


U.S. ETF assets projected to reach \$20 trillion by 2030

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Source: Bloomberg, J.P. Morgan Asset Management. Compound annual growth rate (CAGR).
Guide to ETFs – U.S. Data as of October 31, 2025.



U.S. ETF market share vs. mutual funds

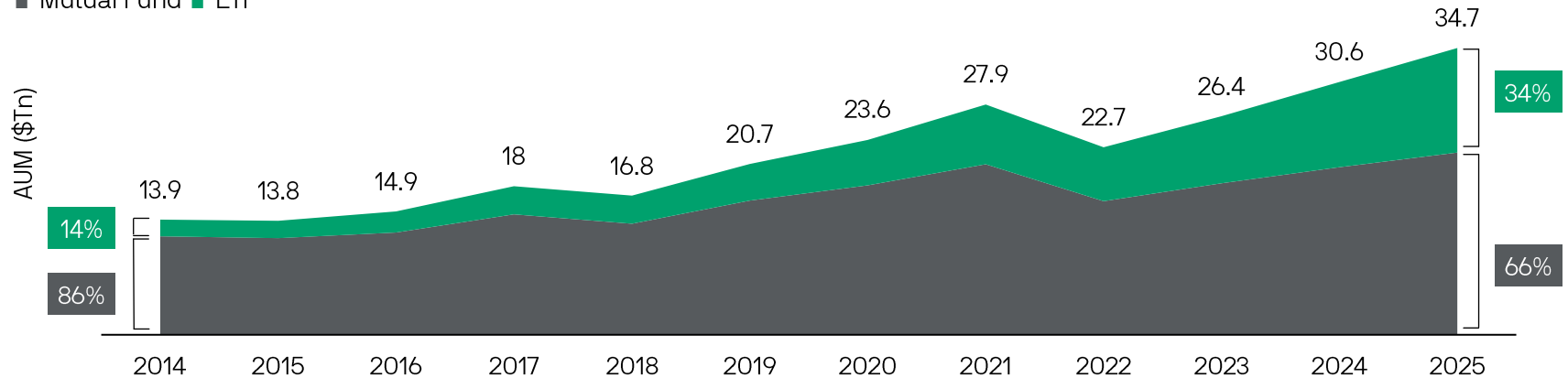
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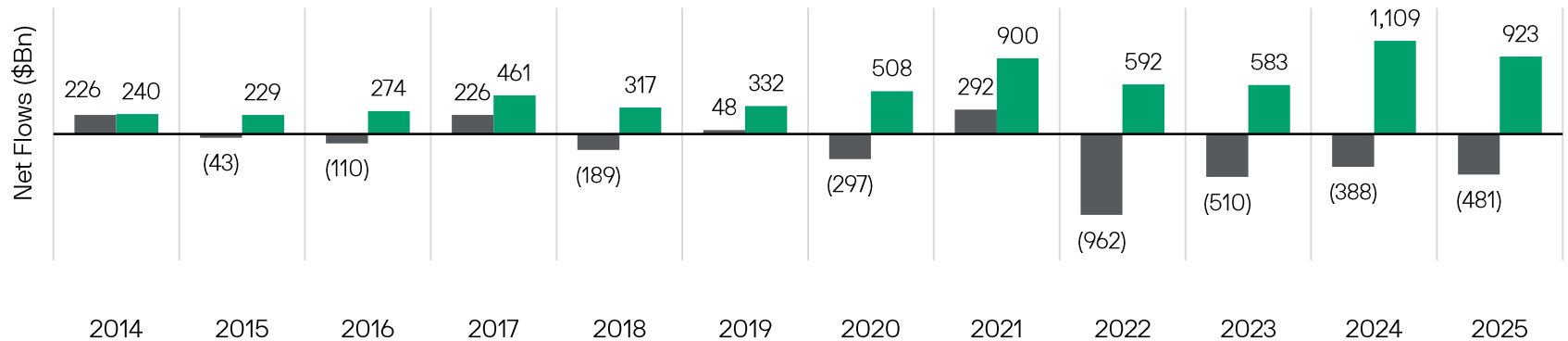
U.S. ETFs and mutual funds, by AUM

■ Mutual Fund ■ ETF



U.S. ETFs and mutual funds, by net flows

■ Mutual Fund ■ ETF



Source: Morningstar, J.P. Morgan Asset Management, charts reflect the most recently available data as of September 30, 2025. Excluding money market and fund of funds.
Guide to ETFs – U.S. Data as of October 31, 2025.



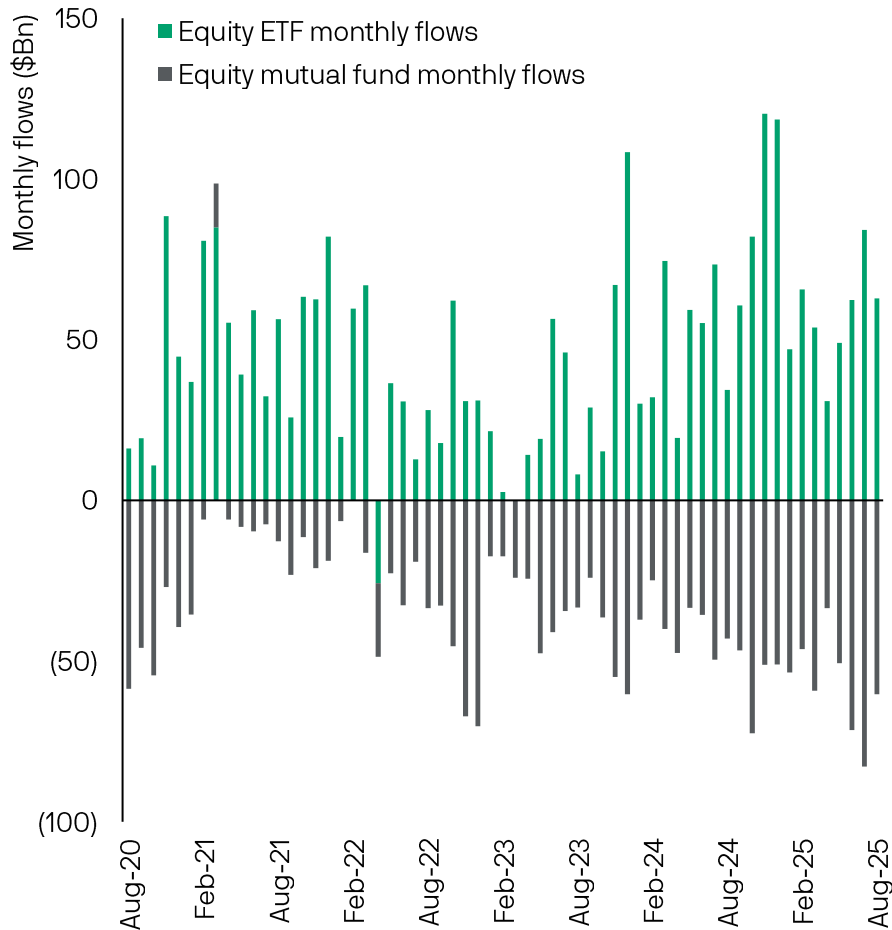
Equity ETF and mutual fund flows and capital gains

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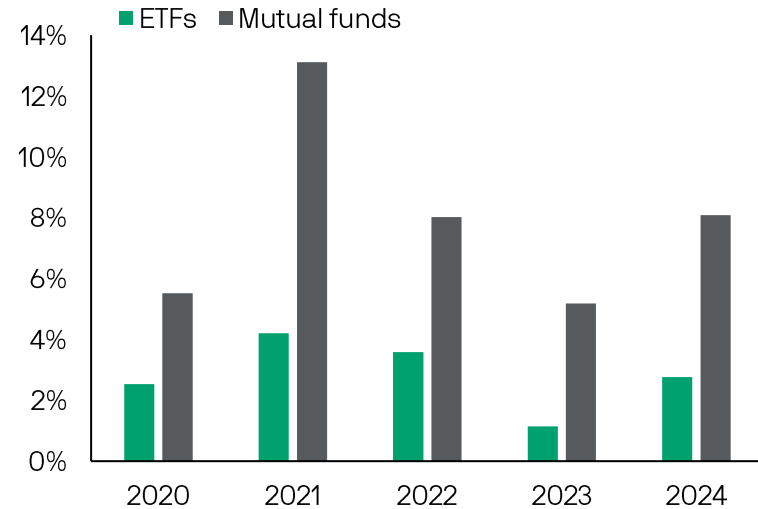
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Trailing 5-year monthly equity mutual fund and ETF net flows



Equity Funds: Average capital gains/net asset value (NAV)



% of equity funds that paid a capital gain

	2020	2021	2022	2023	2024
ETFs	3%	9%	4%	3%	4%
Mutual funds	48%	70%	55%	41%	57%

Includes both active and passive ETFs and mutual funds

Source: Morningstar, J.P. Morgan Asset Management. Left side, data as of September 30, 2025. Right side, data as of December 31, 2024.
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ETFs by type and industry leaders ranked by AUM

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Market Cap

Index tracking market
exposures
AUM: \$9.3Tn

Top 5 Issuers
92% of AUM

BlackRock
Vanguard
SPDR
Invesco
Schwab



Factor

Risk aware weighting
and / or factor exposure
AUM: \$2.4Tn

Top 5 Issuers
86% of AUM

Vanguard
BlackRock
Invesco
Schwab
SPDR



Active

Portfolio is actively managed
AUM: \$1.4Tn

Top 5 Issuers
50% of AUM

DFA
JPMorgan
Capital Group
First Trust
Avantis



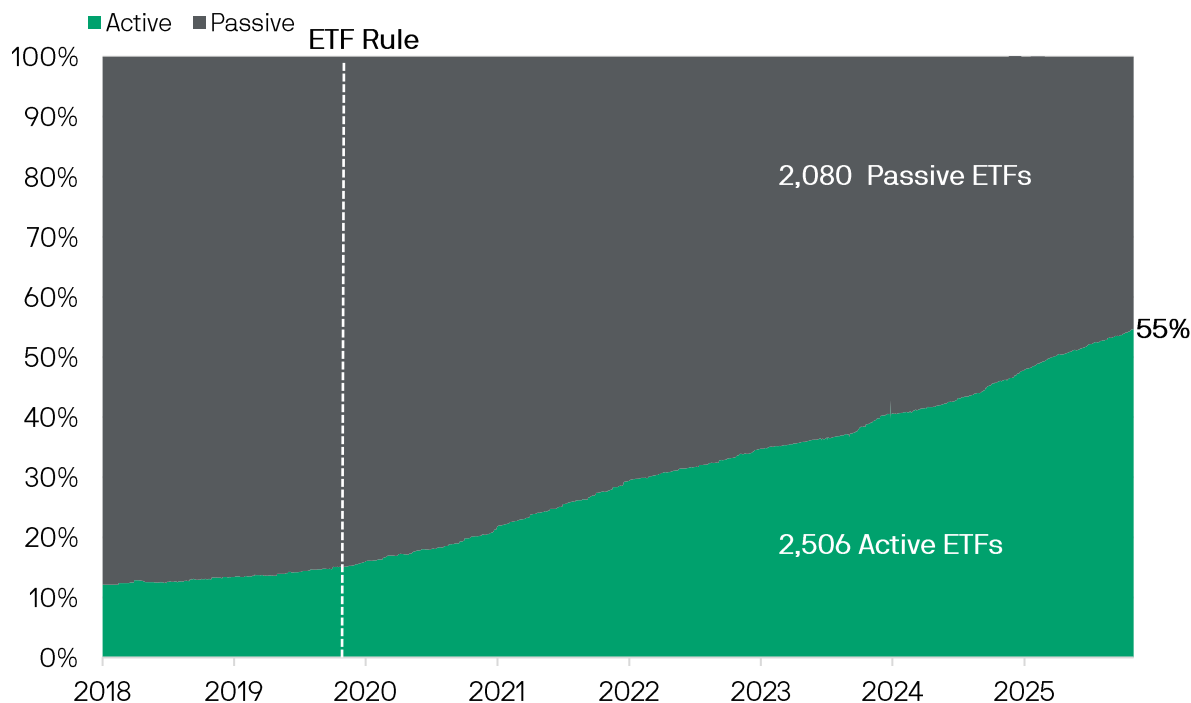
Why has active ETF issuance increased?

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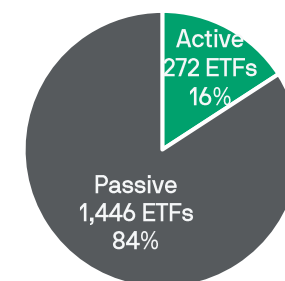
What was the ETF Rule of 2019?

- Streamlined 40 Act ETF regulations
- Let ETF issuers move faster
- Allowed "custom in-kind" basket

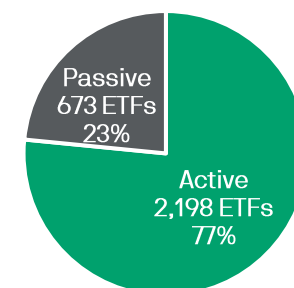
Passive vs. Active (% of total ETFs by product count)



ETFs pre-ETF Rule 1,718 ETFs



ETFs launched post-ETF Rule 2,871 ETFs



Source: Bloomberg, J.P. Morgan Asset Management. Passed in 2019, the ETF Rule, or the SEC Rule 6c-11 under the Investment Company Act of 1940, modernized regulation of ETFs as open-ended funds by establishing clear and consistent framework for most ETFs across both index and actively managed strategies, enabling ETF issuers to bring new strategies to market, and permitting "custom in-kind" creation and redemption baskets to be available for all types of covered ETFs under the new regulation.
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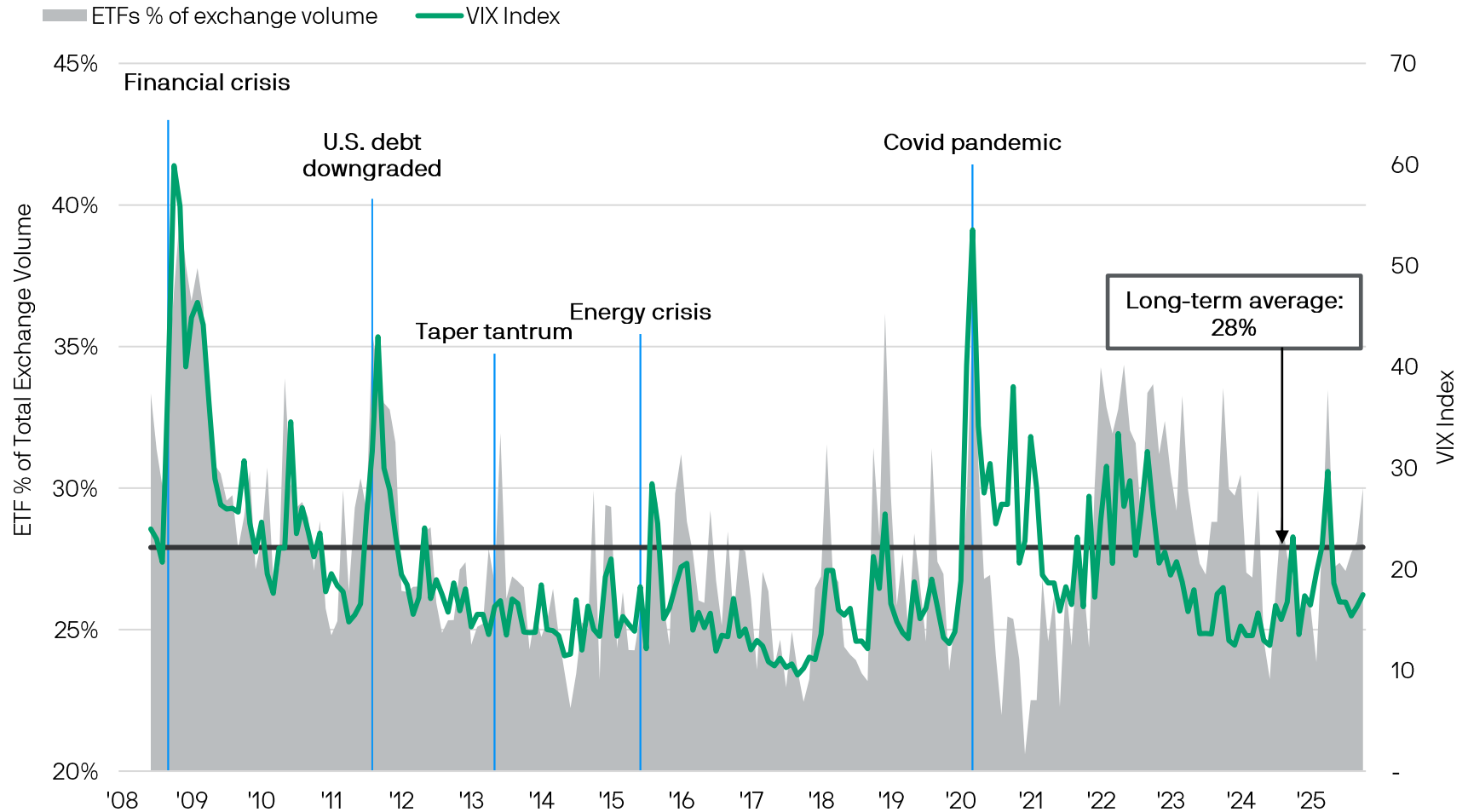
ETF exchange volume during periods of volatility

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Exchange volume highlights ETF market's liquidity



Source: Bloomberg, J.P. Morgan Asset Management. The CBOE Volatility Index, or VIX Index, is a real-time market index representing the market's expectations for volatility over the coming 30 days.
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Investors turning to ETFs

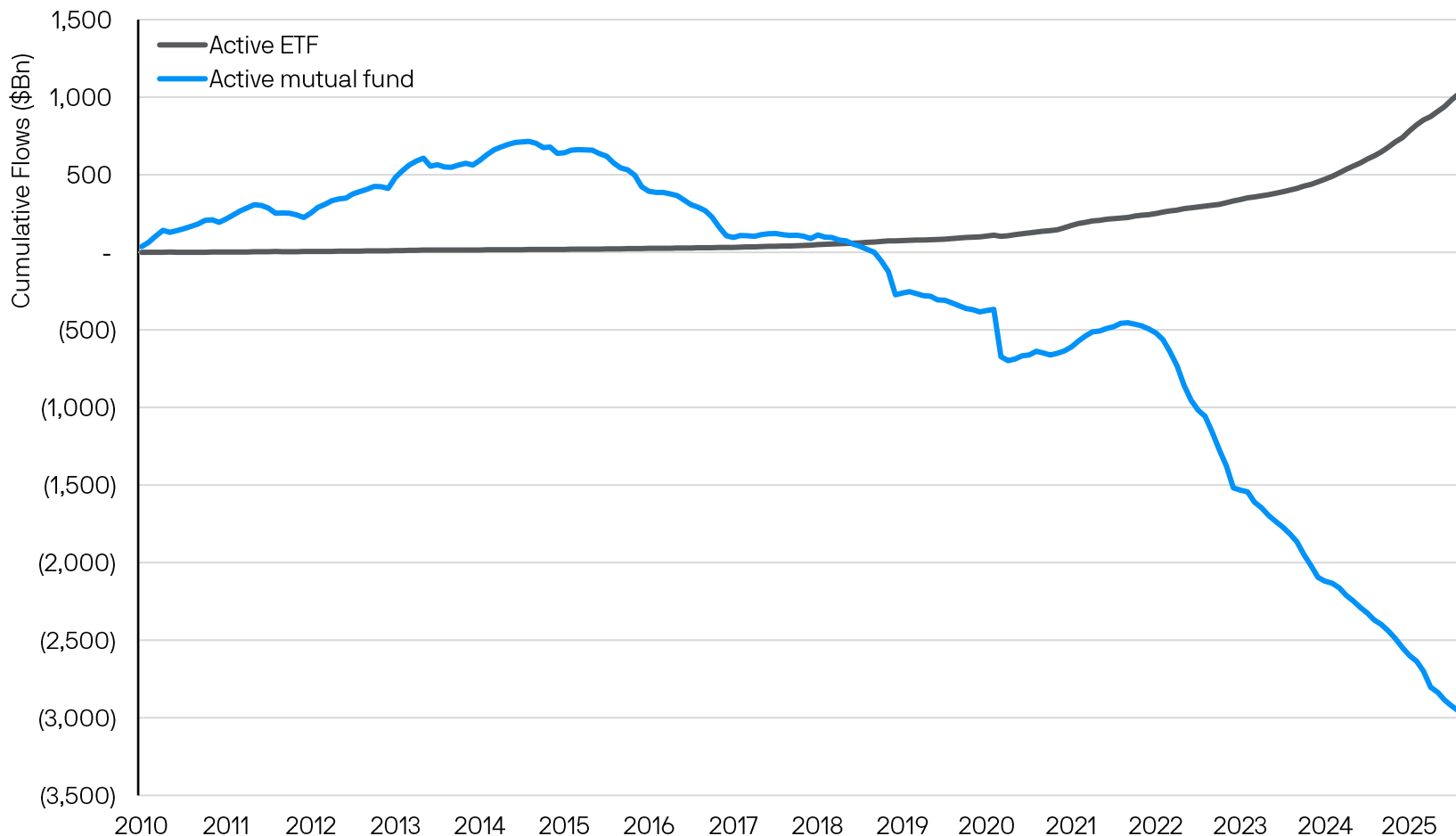
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Active flows across investment structure

Active

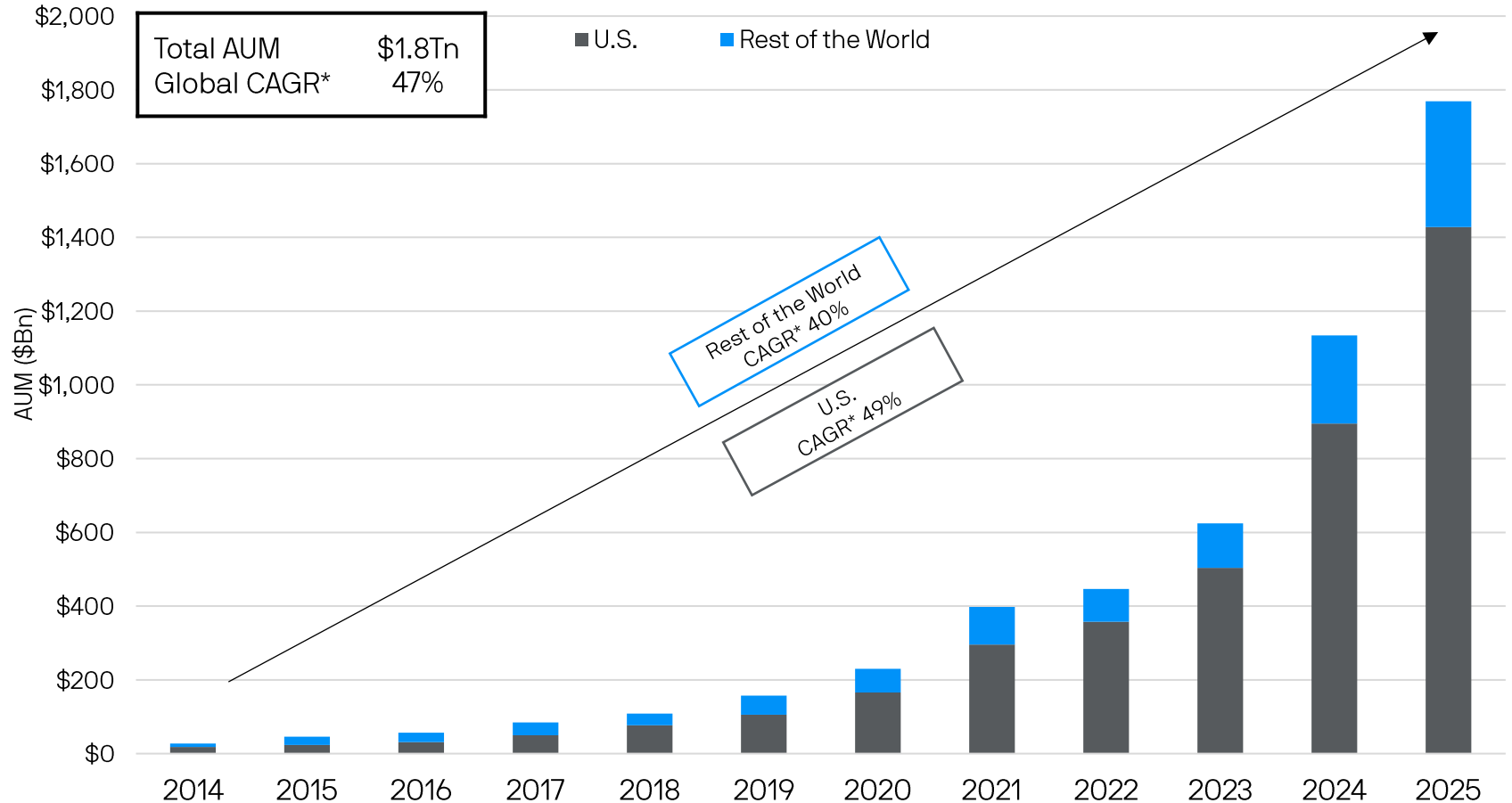


Source: Morningstar, J.P. Morgan Asset Management. Data as of September 30, 2025. Excluding money market and fund of funds.
Guide to ETFs – U.S. Data as of October 31, 2025.

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Over a decade of active ETF growth



Active ETFs are determined by non-index funds Rest of the world consists of Australia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Egypt, Finland, France, Germany, Guernsey, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Japan, Luxembourg, Malaysia, Mauritius, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Saudia Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, UAE and Vietnam. *Compound annual growth rate (CAGR). Source: Bloomberg, J.P. Morgan Asset Management.
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Active ETFs take market share

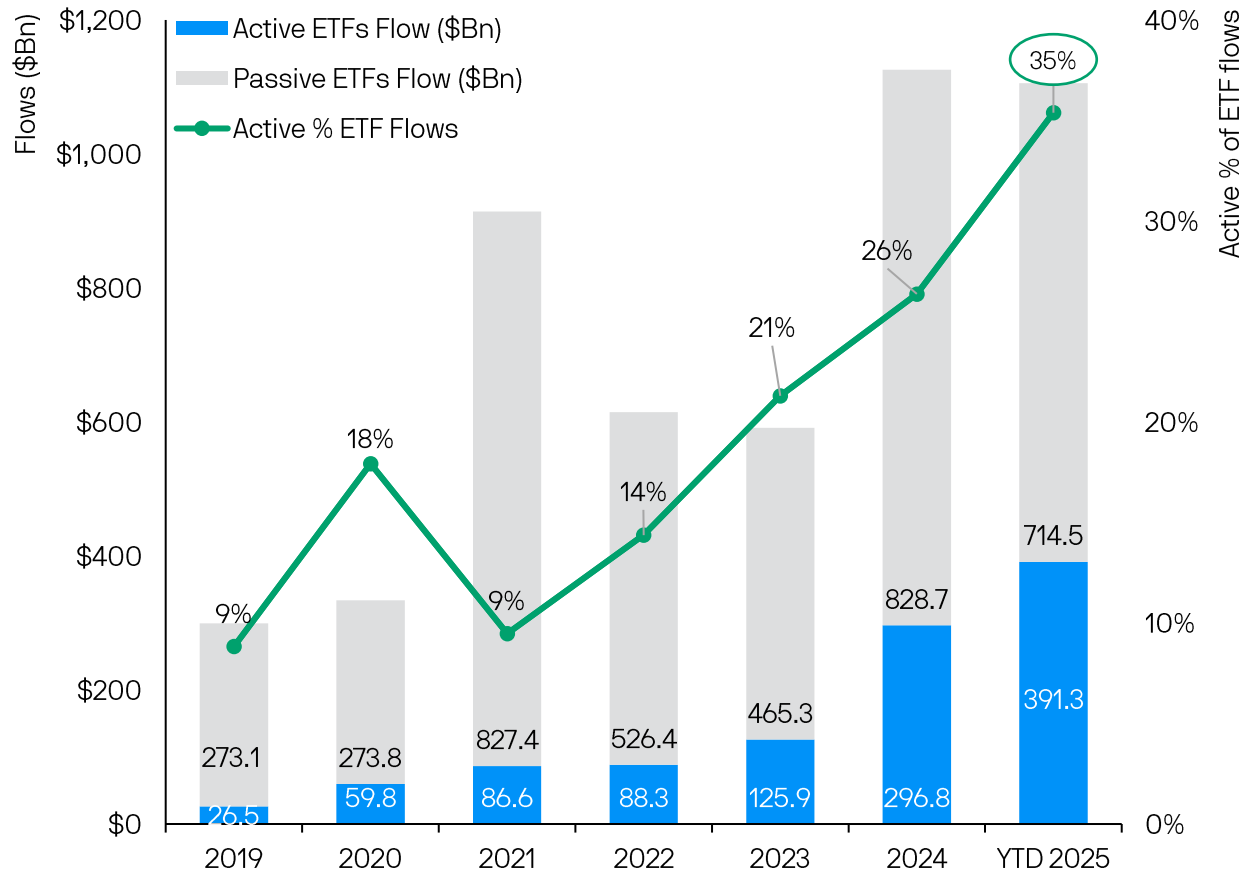
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Active

Active U.S. ETF flows steadily increasing



Flows into active ETFs in 2024 were over 11 x all the flows into active ETFs in 2019

Active ETFs have taken in about 35% of all flows into ETFs in 2025



Active management in an ETF structure

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Active



**Active
Management**

- Research
- Security selection
- Portfolio construction

**Active
ETFs**

**ETF
Benefits**



- Daily transparency
- Intraday liquidity
- Low cost
- Tax efficiency
- Accessibility

Source: J.P. Morgan Asset Management. For illustrative purposes only.
Guide to ETFs – U.S. Data as of October 31, 2025.

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Diversification with lower beta strategies

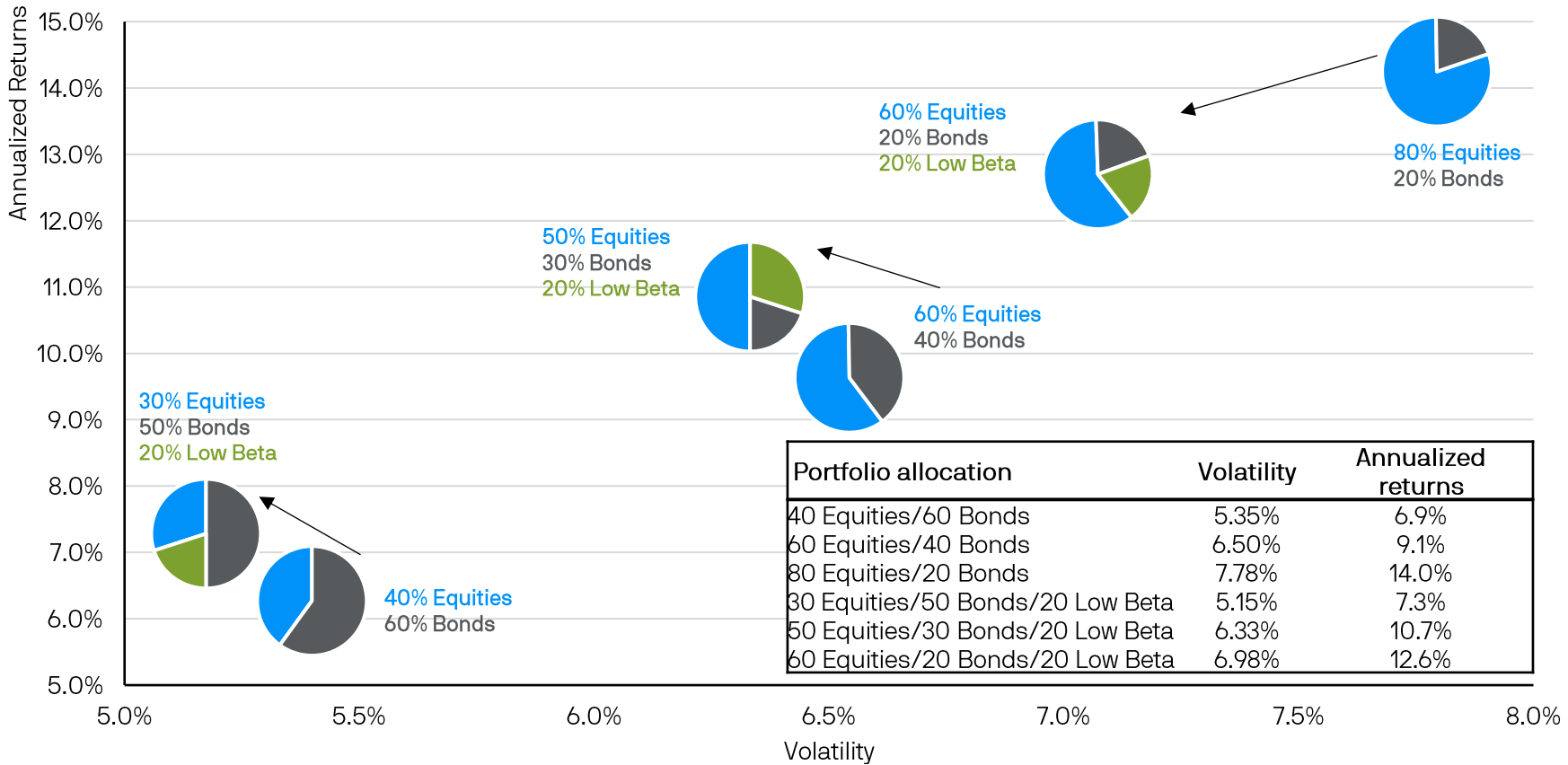
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Low Beta and portfolio risk/return

Annualized volatility and returns, October 2020 – October 2025



Source: Bloomberg, J.P. Morgan Asset Management. Portfolios are rebalanced at the start of the year. Equities are represented by the S&P 500 Index, Bonds are represented by the Bloomberg U.S. Aggregate Index, Low Beta are represented by two strategies equally weighted that have historically had a beta of 0.6 and 0.5, respectively over the represented period. Volatility is calculated as the annualized standard deviation of quarterly returns. Past performance is not a reliable indicator of current and future results.
Guide to ETFs – U.S. Data as of October 31, 2025.

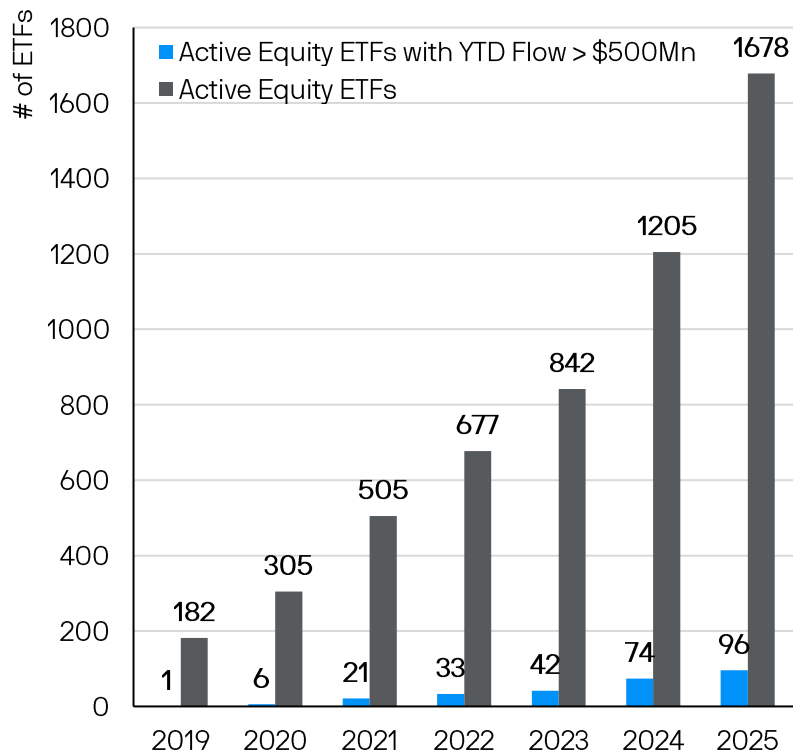


Scaling ETFs requires more than market presence

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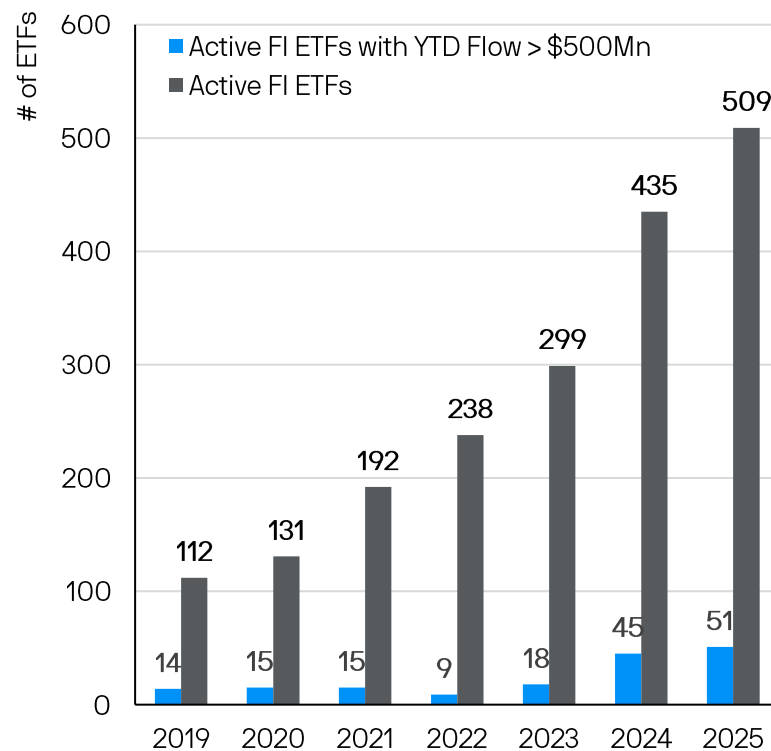
Active

Equity ETFs



Top 5 active equity ETFs, by flows, accounted for about 18% of inflows in 2025

Fixed Income (FI) ETFs



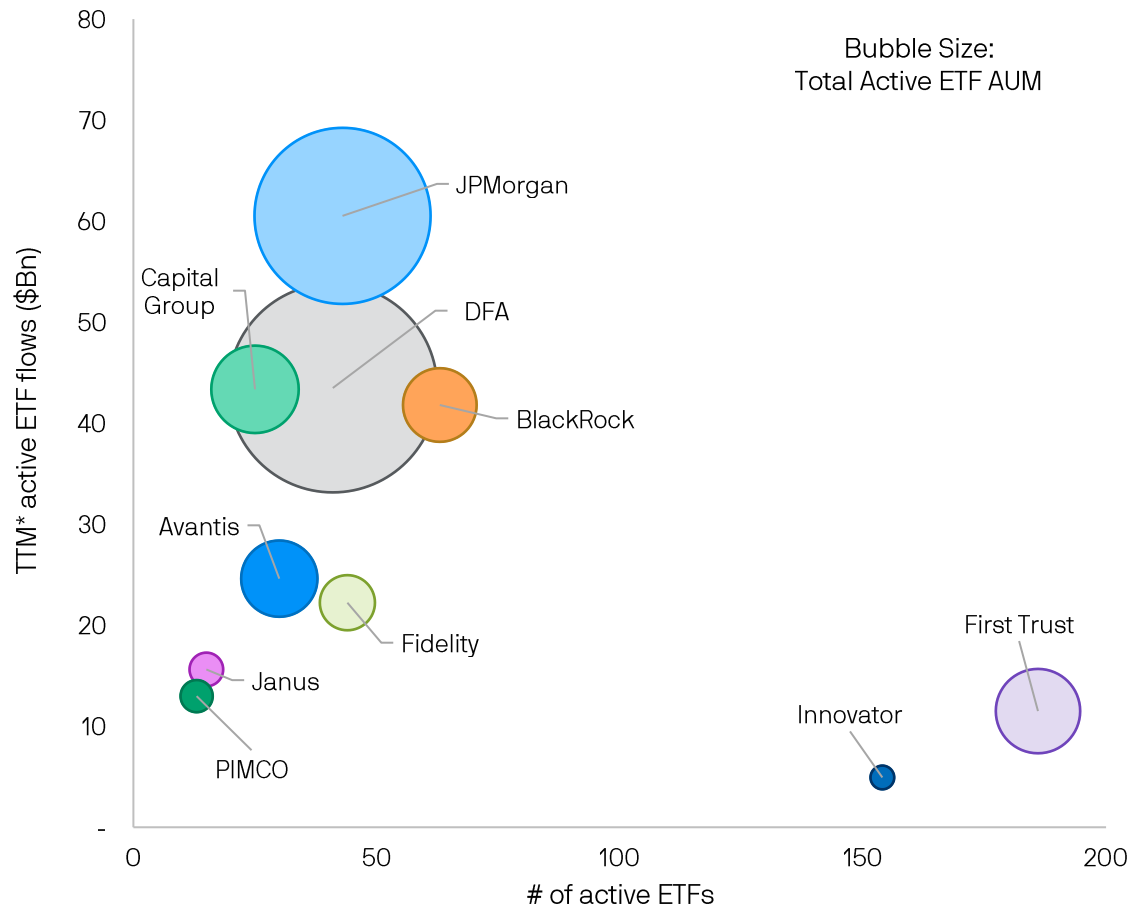
Top 5 active fixed income ETFs, by flows, account for about 25% of inflows in 2025



Key players in the active ETF space

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Top 10 active ETF issuers by AUM



	Active ETF AUM (\$Bn)	TTM* Active ETF Flow (\$Bn)	# of Active ETFs
DFA	231.74	43.48	41
JPMorgan	195.83	60.52	43
Capital Group	98.35	43.35	25
First Trust	94.98	11.5	186
Avantis	86.09	24.61	30
BlackRock	83.2	41.8	63
Fidelity	62.79	22.23	44
Janus	39.18	15.62	15
PIMCO	37.6	12.98	13
Innovator	28.3	4.93	154

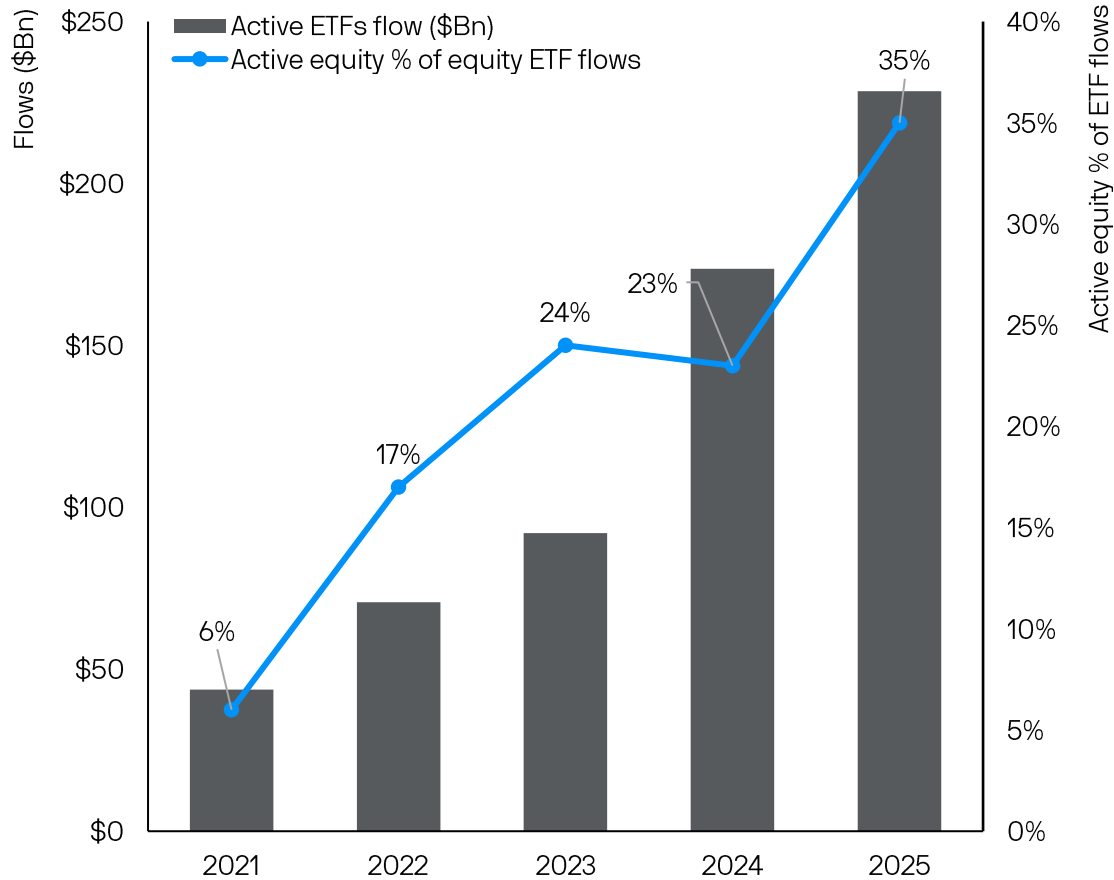
Source: Bloomberg, J.P. Morgan Asset Management. *Trailing twelve months (TTM)
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Active U.S. equity ETF flows

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Active U.S. equity ETF flows



Industry flows by category (\$Mn)

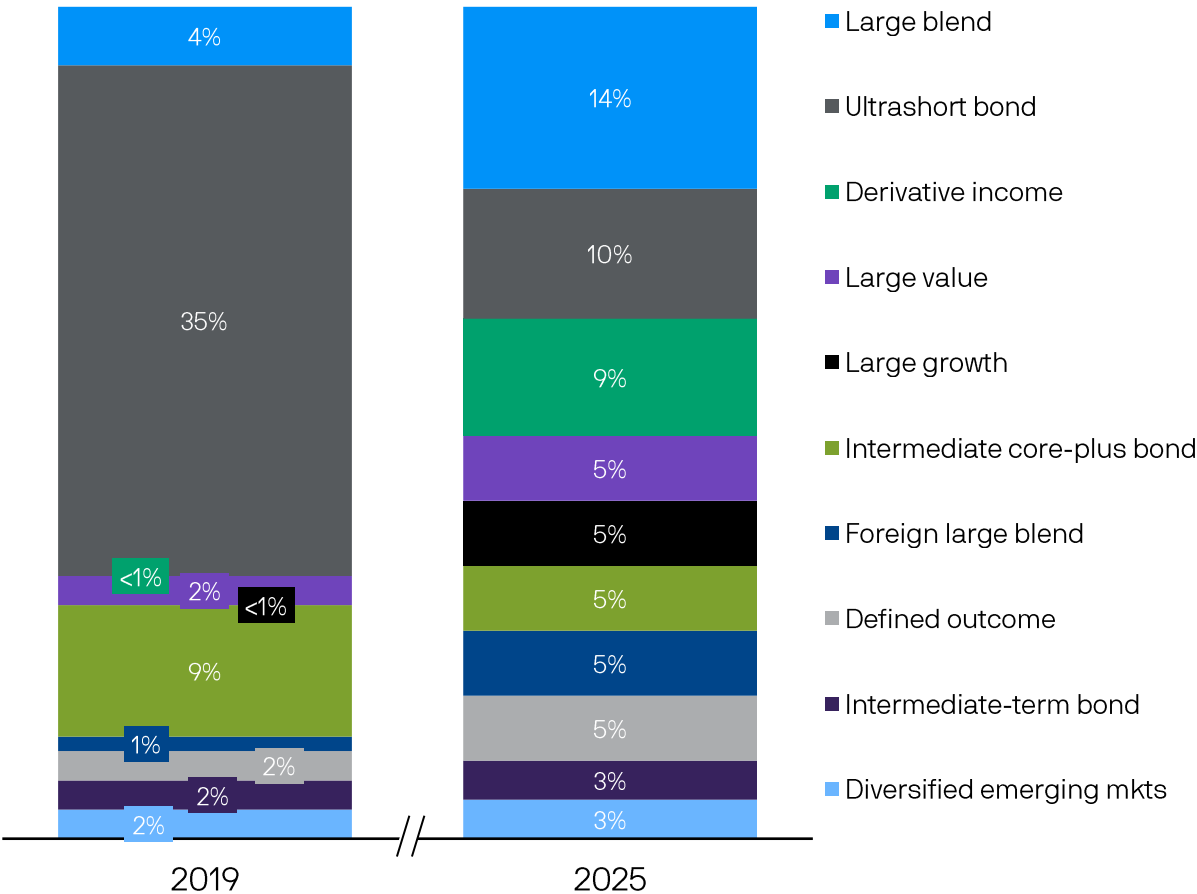
Category	YTD flow	% of flows YTD	AUM
Derivative income	47,531	18%	125,483
Large blend	46,869	18%	198,350
Large value	22,157	9%	76,389
Foreign large blend	17,812	7%	74,001
Large growth	14,840	6%	65,774
Technology	11,065	4%	24,436
Defined outcome	9,893	4%	72,556
Diversified emerging mkts	8,254	3%	36,591
Small value	5,171	2%	39,853
Foreign small/mid value	5,126	2%	18,169

Source: Bloomberg, J.P. Morgan Asset Management.
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Growth trends within the active ETF market

Active AUM across Morningstar categories



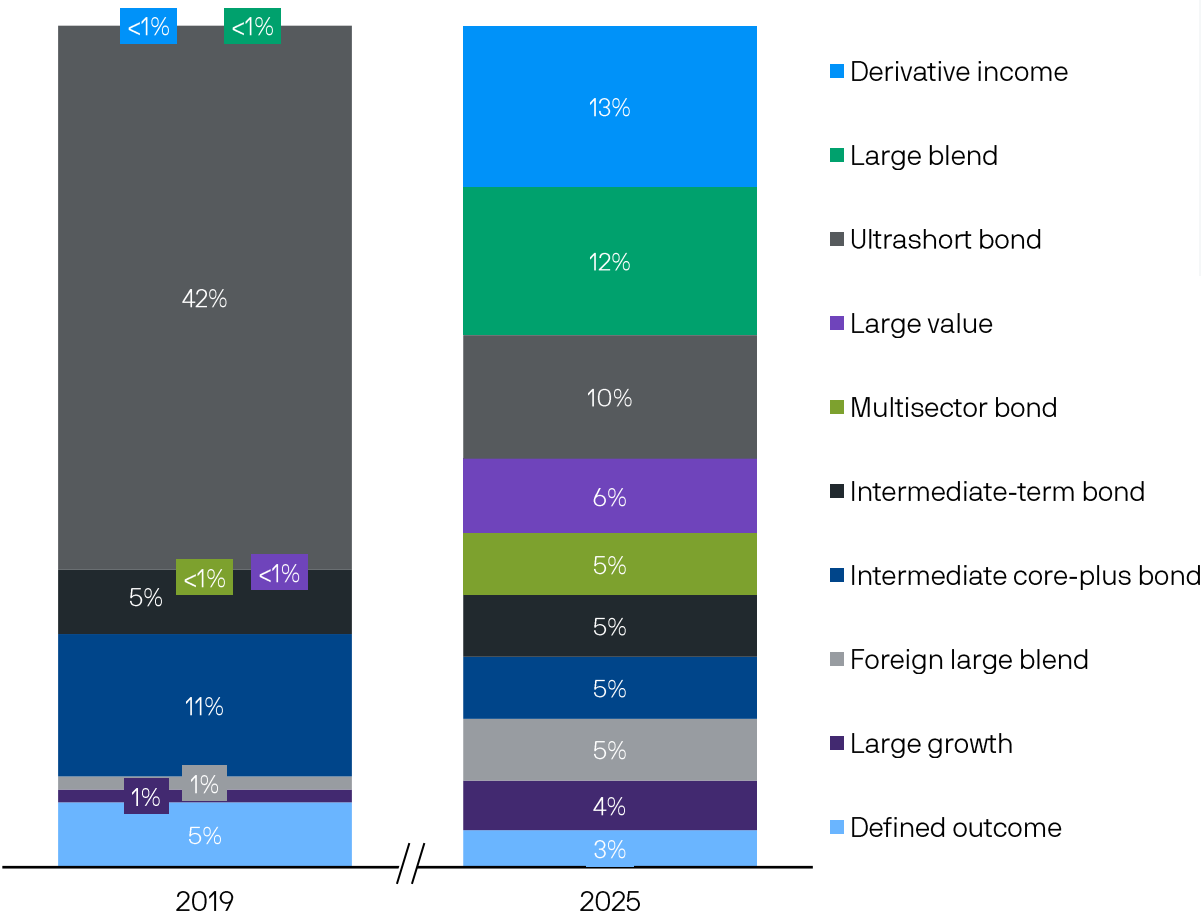
AUM	2019	2025
Select categories*	\$57.7Bn	\$922.7Bn
Active ETF total	\$108.4Bn	\$1.4Tn

Source: Bloomberg, Morningstar, J.P. Morgan Asset Management. Category AUM percentages are percentages of overall active AUM and total percentages will likely not sum to 100% given not all active categories are represented in the chart. *Total AUM of the selected categories.
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Active category flows over time

Percent of active flows across Morningstar categories



AUM	2019	2025
Select categories*	\$15.8Bn	\$259.8Bn
Active ETF total	\$26.5Bn	\$391.3Bn

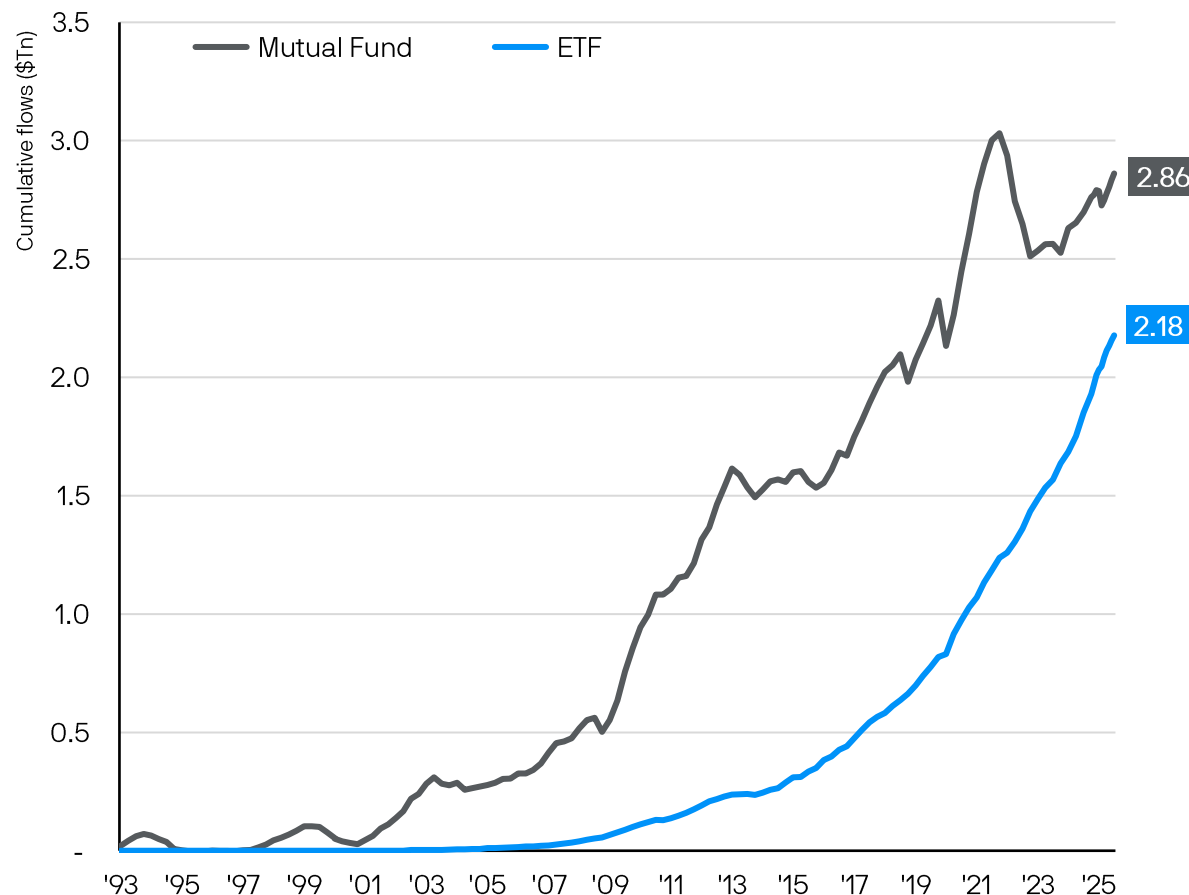
Source: Bloomberg, J.P. Morgan Asset Management. Flow percentages are percentages of total active U.S. ETF flows for the year and total percentages will likely not sum to 100% given not all active categories are represented in the chart. *Total flows of the selected categories. Guide to ETFs – U.S. Data as of October 31, 2025.



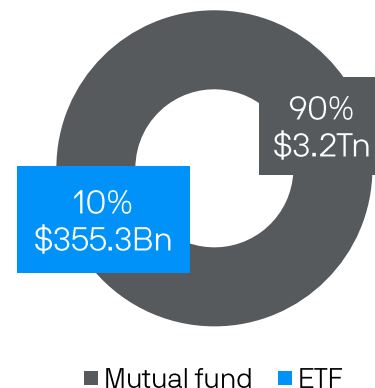
Fixed income flows and AUM, by vehicle

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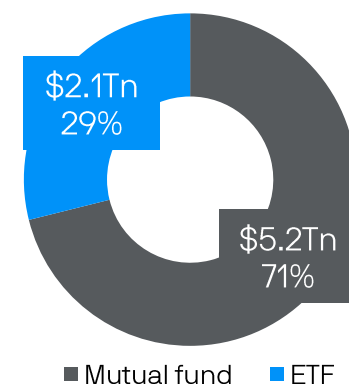
Fixed income ETF flows and AUM are steadily increasing



Fixed income total AUM
2015



Fixed income total AUM
2025



Source: Morningstar, J.P. Morgan Asset Management. Data as of September 30, 2025.
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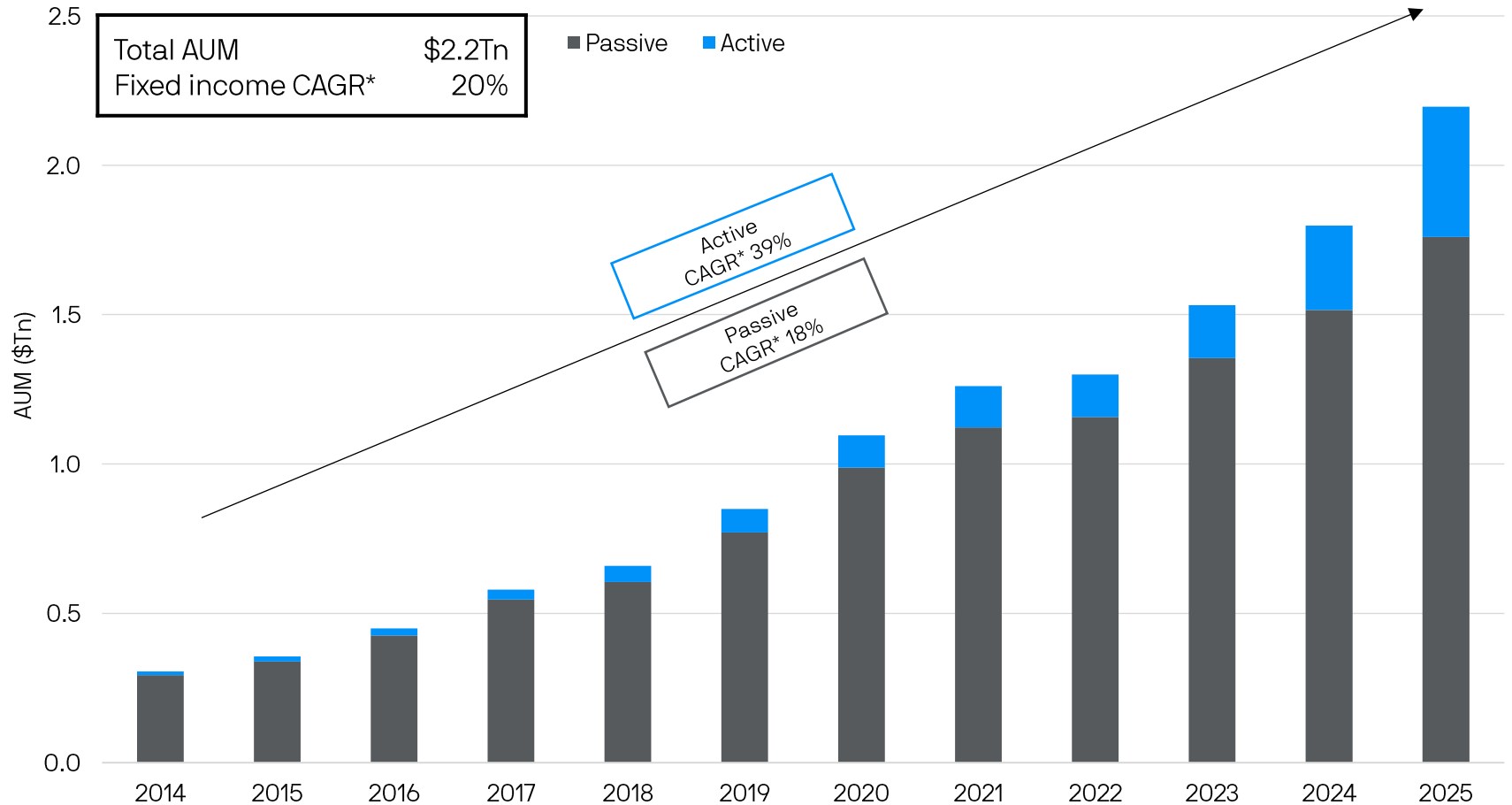
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Active fixed income gaining adoption

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Fixed Income Ecosystem



Source: Bloomberg, FactSet, J.P. Morgan Asset Management. US ETFs only. *Compound annual growth rate (CAGR).
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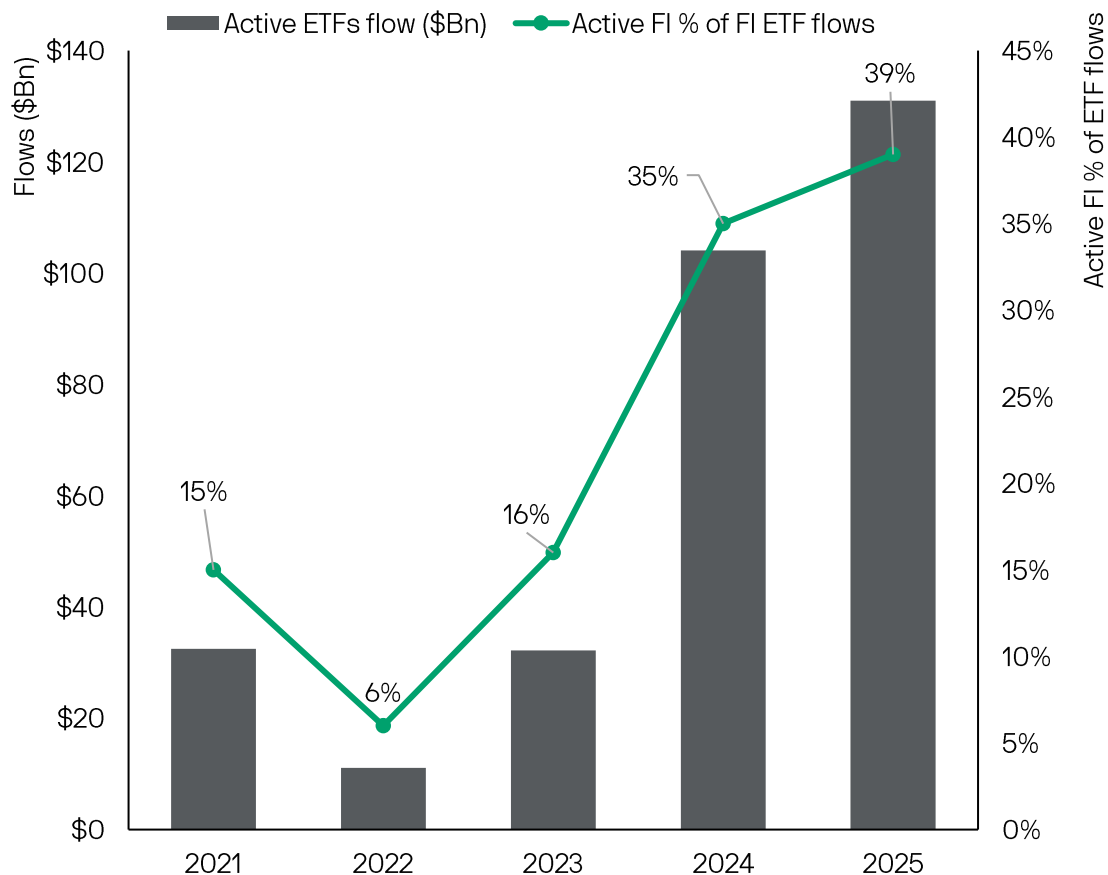
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Active U.S. fixed income ETF flows

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Active U.S. fixed income (FI) ETF flows



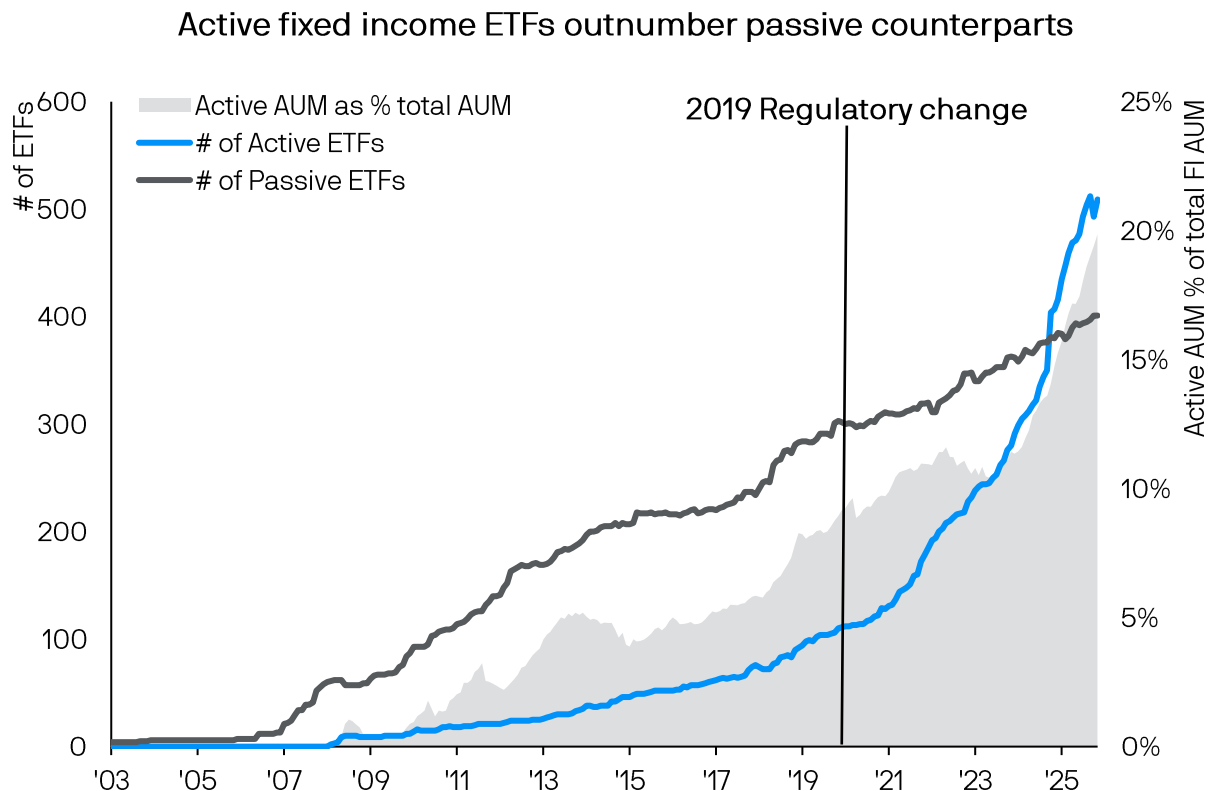
Industry flows by category (\$Mn)

Category	YTD flow	% of flows YTD	AUM
Ultrashort bond	34,790	23%	135,075
Multisector bond	20,812	14%	38,314
Intermediate core-plus bond	18,528	12%	71,599
Intermediate-term bond	17,582	12%	45,996
Short-term bond	9,291	6%	25,045
Muni national interm	8,572	6%	22,008
Muni national short	4,240	3%	11,110
High yield muni	4,150	3%	8,249
High yield bond	2,418	2%	10,820
Intermediate government	2,098	1%	9,638

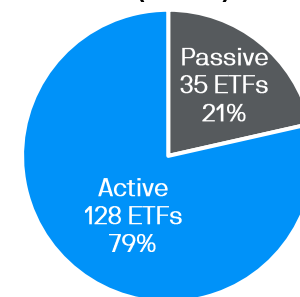


Turning point in the fixed income ETF market

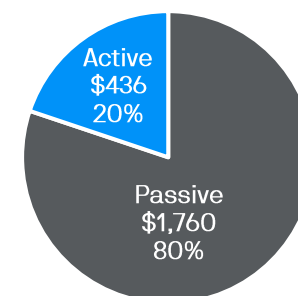
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Fixed income ETF launches (TTM*)



Fixed income AUM (\$Bn)





Growth runway for active ETFs in fixed income

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48% of the \$58 trillion U.S. bond market is not captured by the Bloomberg U.S. Aggregate Index

Fixed Income Ecosystem

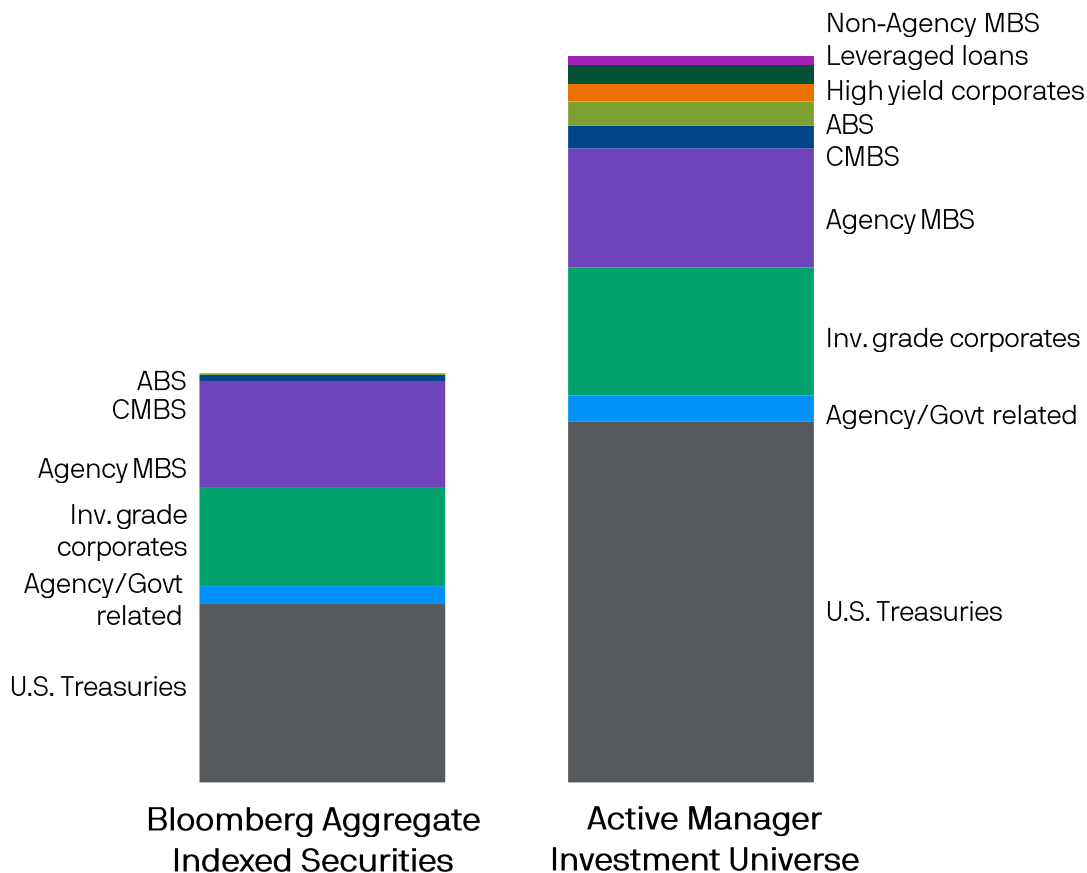
\$141 Trillion
Global Fixed Income Market

3Mn
Unique Bonds

VS.

\$115 Trillion
Global Equity Market

9K
securities



Source: Bloomberg, CS Leveraged Loan Index, ICE BofA US HY Index, J.P. Morgan Asset Management, SIFMA. Figures reflect the most recently available data as of September 30, 2024. Some components may be lagged.
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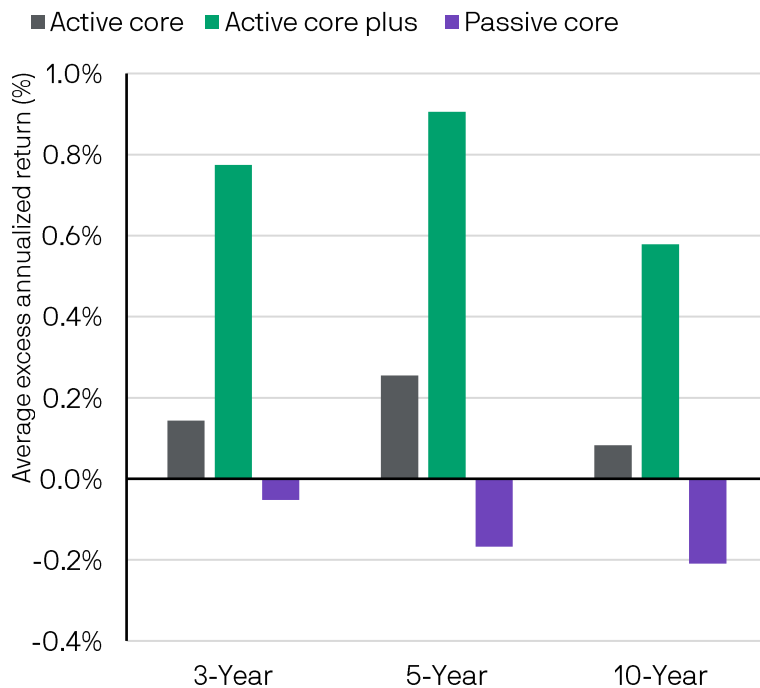


Active fixed income managers outperform their passive peers

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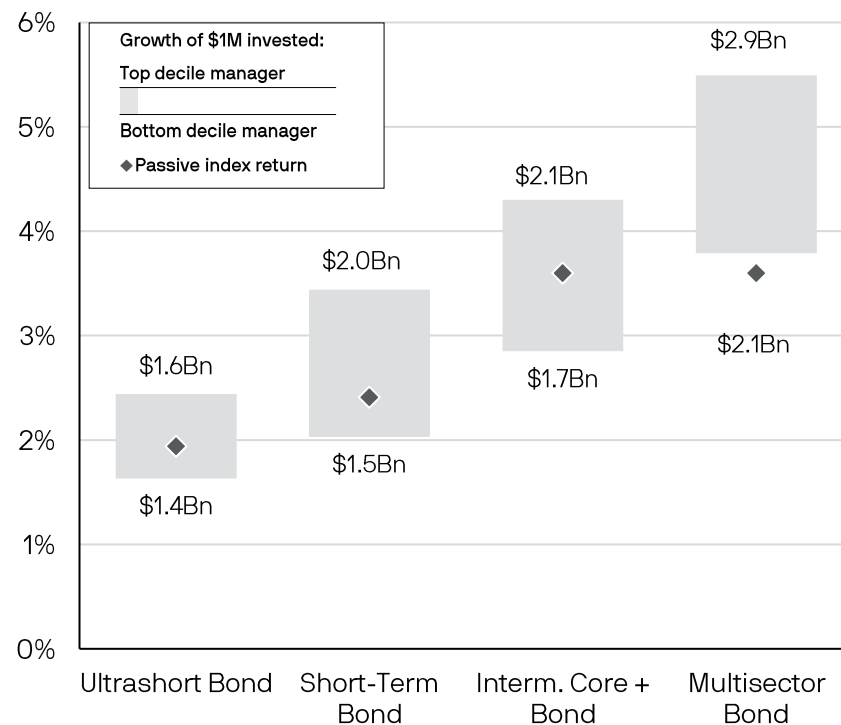
Active typically outperforms passive

Average excess annualized returns over the Bloomberg U.S. Aggregate Bond Index



Wide dispersion among top and bottom managers

20-year manager return dispersion and growth of capital
(By asset type, annualized total returns, growth of \$1M invested 20 years ago*)

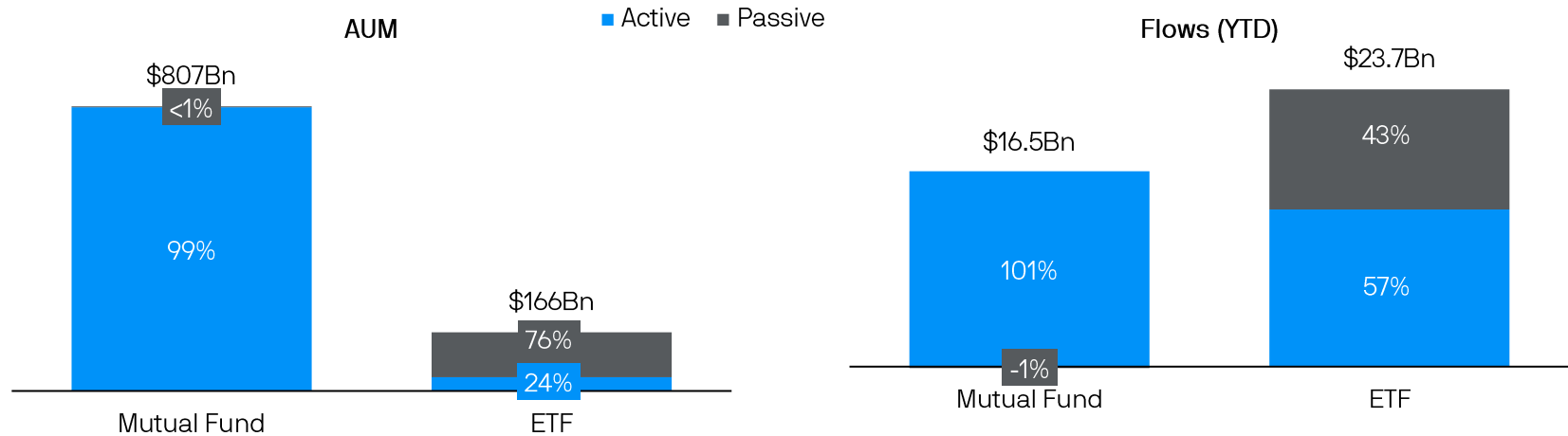


LHS: Morningstar, J.P. Morgan Asset Management analysis; charts reflect the most recently available data as of September 30, 2025. Analysis includes mutual funds and ETFs in the Morningstar intermediate core and intermediate core plus categories with a primary prospectus benchmark of the Bloomberg US Aggregate Bond Index. Only includes oldest share class. Past performance is not indicative of future returns. Core bonds typically hold less than 5% in below investment grade debt. RHS Source: Morningstar, J.P. Morgan Asset Management. *Represents average annual portfolio return dispersion between the 10th and 90th percentile over a 20-year period for each Morningstar Category, including mutual funds and ETFs. Returns are updated monthly and reflect data through October 31, 2025. This information is for illustrative purposes only, does not reflect actual investment results, is not a guarantee of future results and is not a recommendation. **Ultrashort Bond: Bloomberg Govt/Corp 1 Yr Duration Index, Short-Term Bond: Bloomberg 1-3 Yr U.S. Govt/Credit Total Return Index, Intermediate Core Plus Bond: Bloomberg U.S. Universal Total Return Index, Multisector Bond: Bloomberg U.S. Universal Total Return Index. Guide to ETFs – U.S. Data as of October 31, 2025.

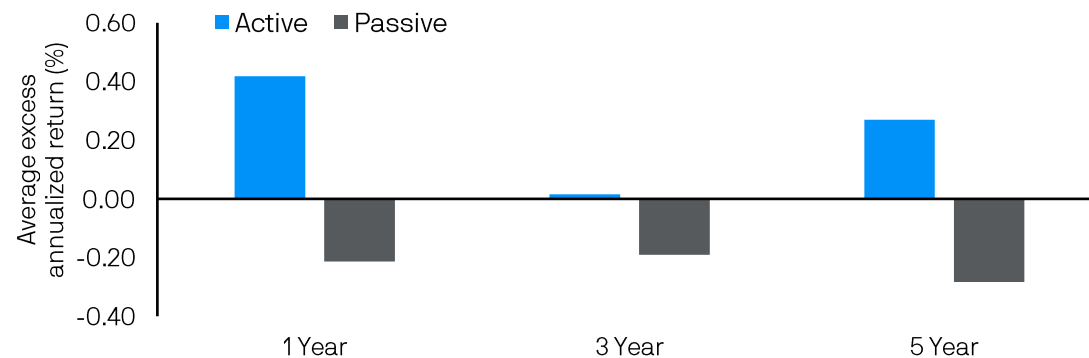


Muni ETF growth – the trend is active

Municipal AUM and flows, by vehicle



Active intermediate municipal managers have delivered outperformance



Top 5 active municipal ETF issuers

Firm	AUM (\$Bn)	% of YTD flows
JPMorgan	11.8	36%
Capital Group	7.6	24%
BlackRock	4.3	10%
First Trust	3.7	<1%
Franklin Templeton	3.7	4%

Source: Morningstar, J.P. Morgan Asset Management. Bottom left chart: Morningstar, J.P. Morgan Asset Management analysis; charts reflect the most recently available data as of September 30, 2025. Analysis includes mutual funds and ETFs in the Morningstar Intermediate Municipal category with a primary prospectus benchmark of the Bloomberg Municipal Bond Index. Only includes oldest share class. Past performance is not indicative of future returns.
Guide to ETFs – U.S. Data as of October 31, 2025.



Navigating risk in the high yield market

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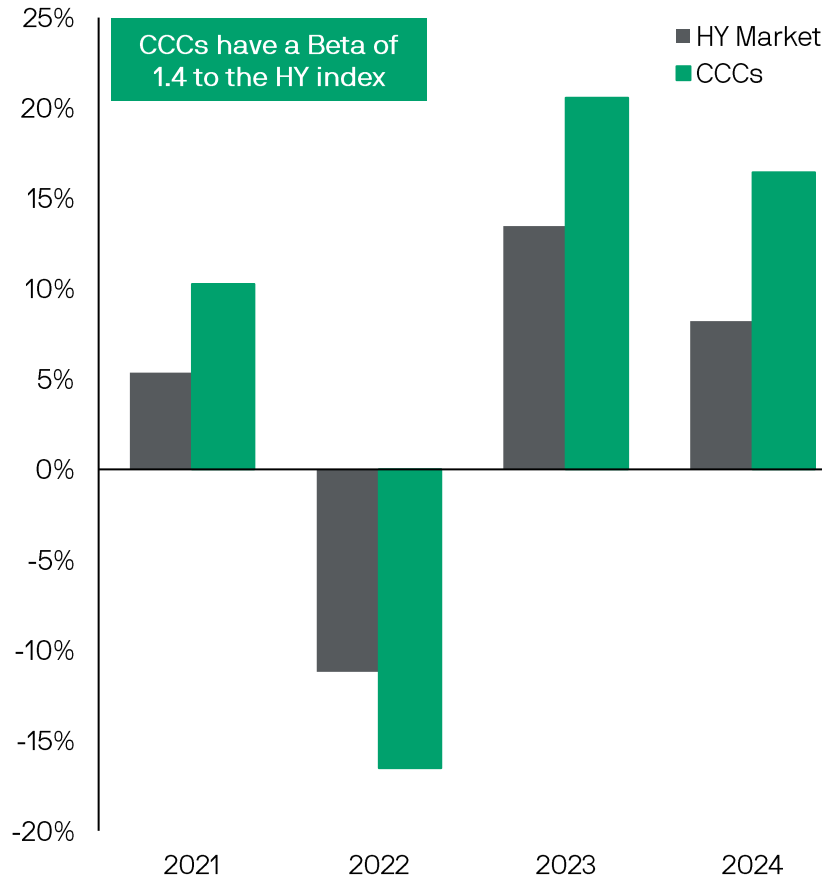
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Fixed Income Ecosystem

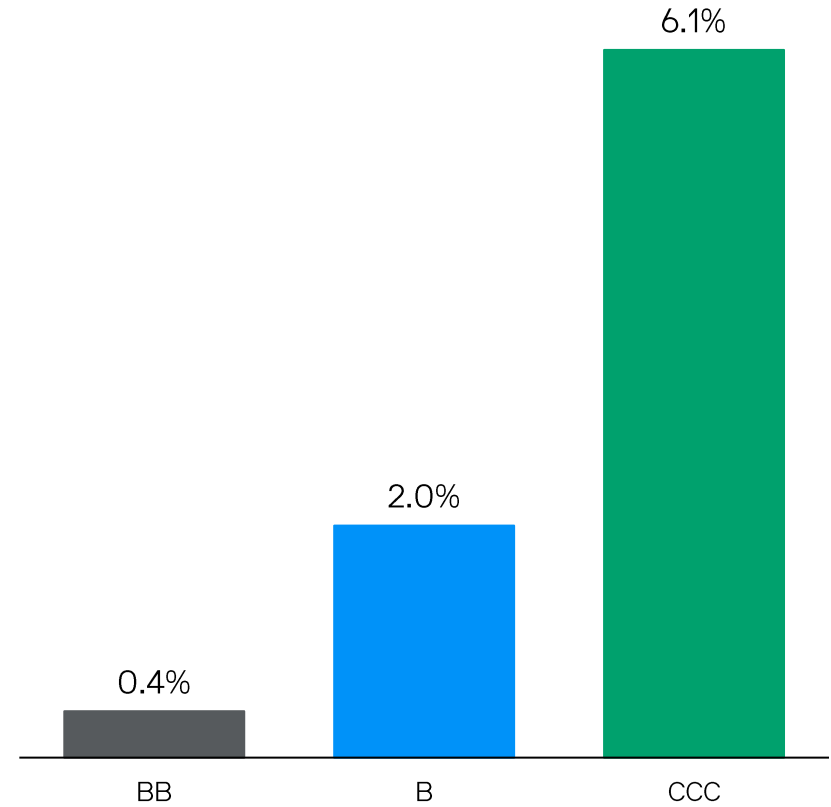
CCCs returns are volatile

Calendar year returns



Elevated default risks in CCCs

Default rates by rating – 12 months prior to default. 23-year average



Left side: ICE; ICE BofA US High Yield Constrained Index and ICE BofA CCC and Lower US High Yield Constrained Index.
Right side: JPMorganChase Commercial & Investment Bank (CIB). All data as of December 31, 2024.
Guide to ETFs – U.S. Data as of October 31, 2025.



Top 10 industry leaders

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Trends

Overall ETF leaders by YTD net flows (\$Mn)

Issuer	AUM	YTD flow	1Y flow	1M flow	2025 Organic growth rate	Total products/ last 12M
1 Vanguard	3,759,051	311,692	384,995	48,549	10%	99 / 13
2 BlackRock	3,896,154	261,517	346,074	31,525	8%	465 / 39
3 SPDR	1,800,018	62,419	103,402	25,889	4%	175 / 17
4 JPMorgan	263,302	53,906	63,702	10,516	30%	68 / 8
5 Invesco	795,688	53,866	82,375	10,178	9%	240 / 14
6 Capital Group	98,347	38,607	43,352	4,904	79%	25 / 4
7 DFA	231,743	35,747	43,477	3,671	21%	41 / 1
8 Schwab	481,467	34,059	45,607	1,487	9%	34 / 3
9 Fidelity	148,833	23,557	33,327	3,586	22%	79 / 6
10 Avantis	86,095	21,538	24,607	2,944	40%	30 / 2
Other	1,529,765	209,309	244,304	26,954	19%	3,329 / 904
TOTAL	13,090,846	1,105,863	1,413,303	170,557	11%	4,586 / 1,012

Industry flows by category (\$Mn)

Overall exposure	YTD flow	AUM
U.S. Equity	398,463	7,009,412
Taxable Bond	312,342	2,017,861
International Equity	155,898	1,834,953
Nontraditional Equity	65,972	240,483
Commodities	45,968	290,729
Sector Equity	43,847	1,121,398
Leveraged/Inverse	40,979	348,667
Municipal Bond	30,602	177,371
Money Market	4,774	4,926
Allocation	4,563	36,859
Other	2,455	8,187
Total	1,105,863	13,090,846

Active ETF leaders by YTD net flows (\$Mn)

Issuer	AUM	YTD flow	1Y flow	1M flow	2025 Organic growth rate	Total products/ last 12M
1 JPMorgan	195,828	48,136	60,524	5,710	37%	43 / 8
2 BlackRock	83,197	39,972	41,802	4,032	116%	63 / 22
3 Capital Group	98,347	38,607	43,352	4,904	79%	25 / 4
4 DFA	231,743	35,747	43,477	3,671	21%	41 / 1
5 Avantis	86,095	21,538	24,607	2,944	40%	30 / 2
6 Fidelity	62,792	16,719	22,232	2,646	41%	44 / 6
7 YieldMax ETFs	16,173	15,236	18,523	-262	185%	57 / 22
8 Janus	39,176	12,262	15,615	-439	47%	15 / 4
9 PIMCO	37,595	11,528	12,983	1,529	45%	13 / 0
10 Neos Funds	14,812	9,694	10,508	1,210	229%	13 / 6
Other	562,316	142,425	164,700	21,105	40%	2,162 / 793
TOTAL	1,428,075	391,858	458,327	47,047	44%	2,506 / 868

Industry flows by category (\$Mn)

Active exposure	YTD flow	AUM
Taxable Bond	118,818	404,705
U.S. Equity	99,522	434,699
Nontraditional Equity	63,435	218,377
International Equity	49,698	193,765
Municipal Bond	17,307	46,118
Leveraged/Inverse	15,735	50,464
Sector Equity	14,647	43,154
Money Market	4,774	4,926
Allocation	4,273	16,700
Alternative	2,037	5,443
Other	1,610	9,725
Total	391,858	1,428,075

Source: Bloomberg, FactSet, J.P. Morgan Asset Management. U.S. ETFs only; excludes ETNs. Leveraged/Inverse includes Inverse Equity, Leveraged Equity, Inverse Debt, Leveraged Debt, Leveraged Commodities, among others. The companies discussed are shown for illustrative purposes only. Their inclusion should not be interpreted as a recommendation to buy or sell. Organic growth rate calculated as YTD Flows / 2024 AUM.

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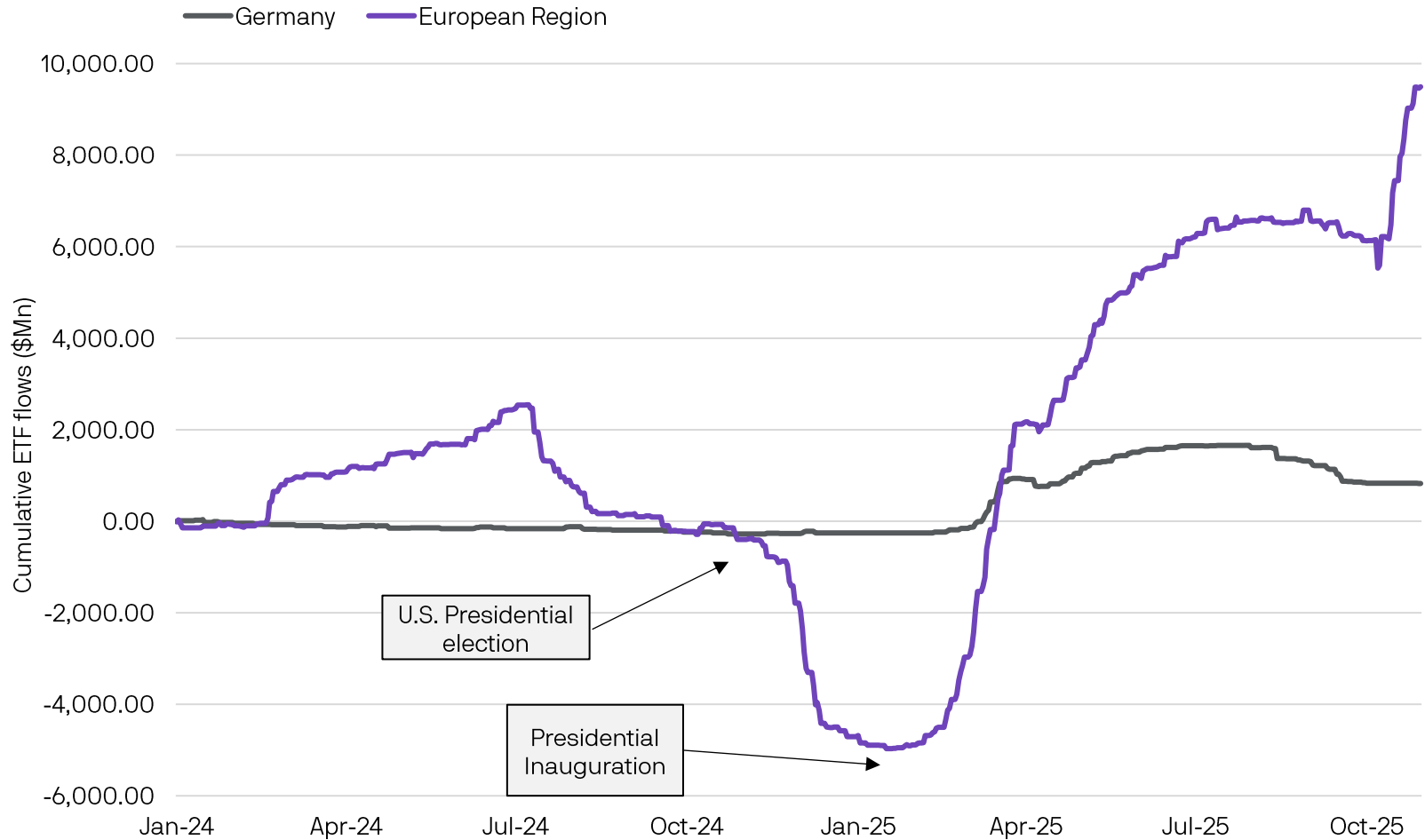
A lens into investor sentiment by ETF flows

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Resurgence of ETF flows into European ETFs



Trends

Source: Bloomberg, J.P. Morgan Asset Management. European and Germany ETFs as defined by geographic focus by Bloomberg. Guide to ETFs – U.S. Data as of October 31, 2025.

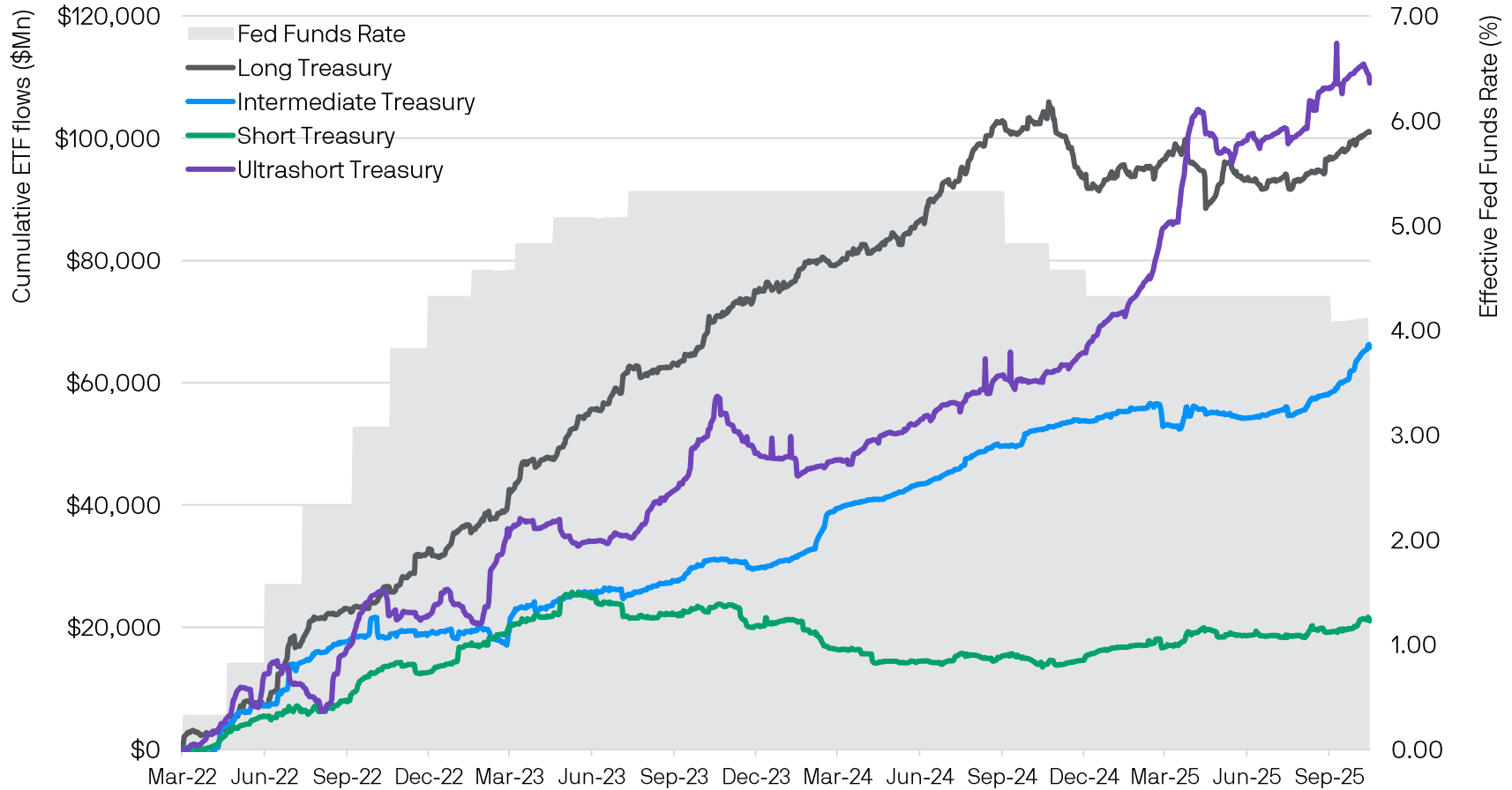
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Treasury ETF flows since the Fed's first rate increase

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ETF Treasury flows have favored the long end of the yield curve



Trends

Source: Bloomberg, J.P. Morgan Asset Management.
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Defining a theme

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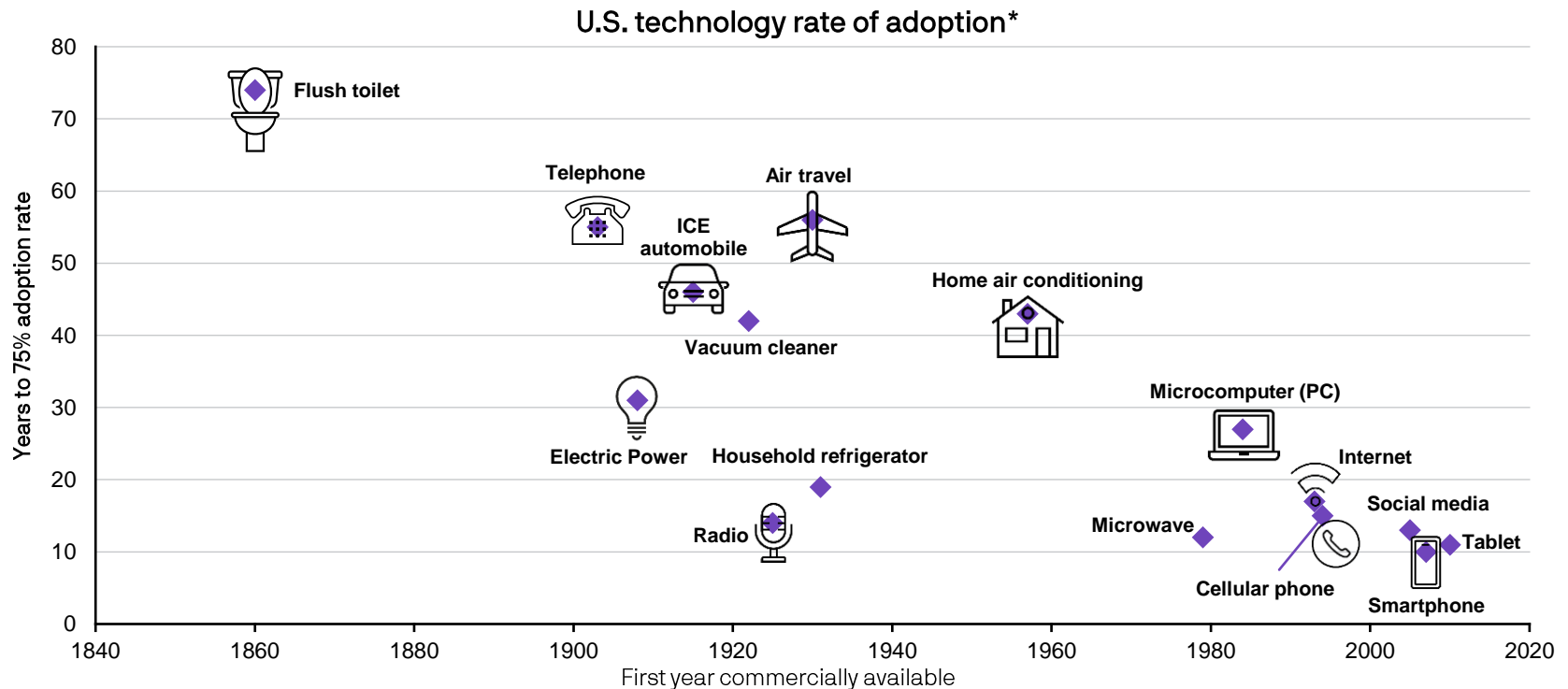
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Themes are:

- A disruption that alters a paradigm and assumes the future will differ from the past. Sector agnostic.
- Sector, geographically and market size agnostic – though leans toward mid to small cap.
- ETFs have democratized thematic investing to a certain extent, though it is limited to companies in the public domain.
- A concept begins as a theme and then becomes ubiquitous. Electricity, telephone, railroads were all transformative themes at one point.

Trends



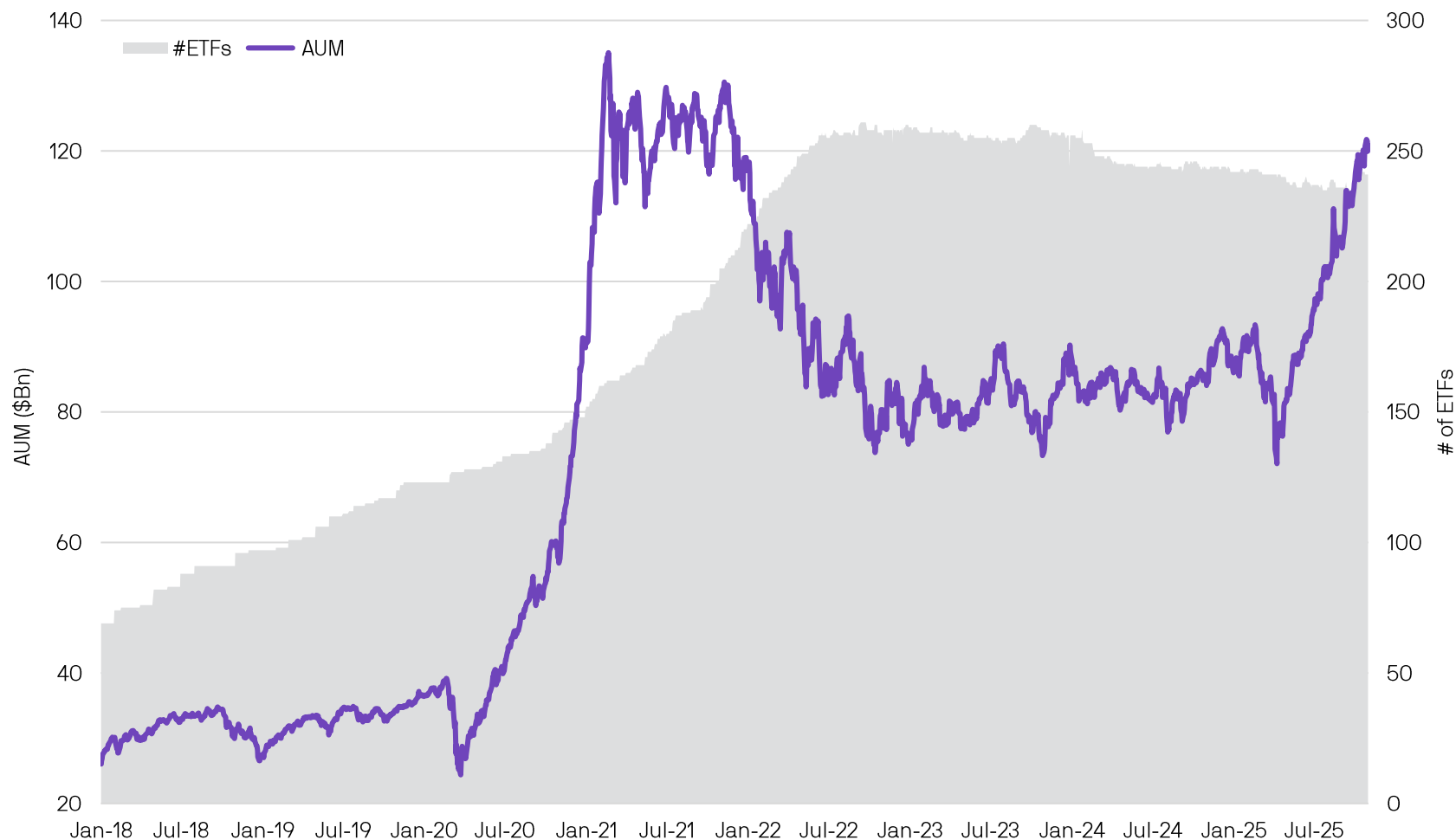
Source: Asymco, compiled from various sources with support of the Clayton Christensen Institute, J.P. Morgan Asset Management.
*Estimated from current adoption trends. Chart is exhibit 5 in "The transformative power of generative AI: Supercharged productivity or mass joblessness?" by J.P. Morgan Asset Management.
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The timeline of thematic ETF AUM

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Thematic ETF Growth



Trends

Source: Bloomberg, J.P. Morgan Asset Management.
Guide to ETFs – U.S. Data as of October 31, 2025.

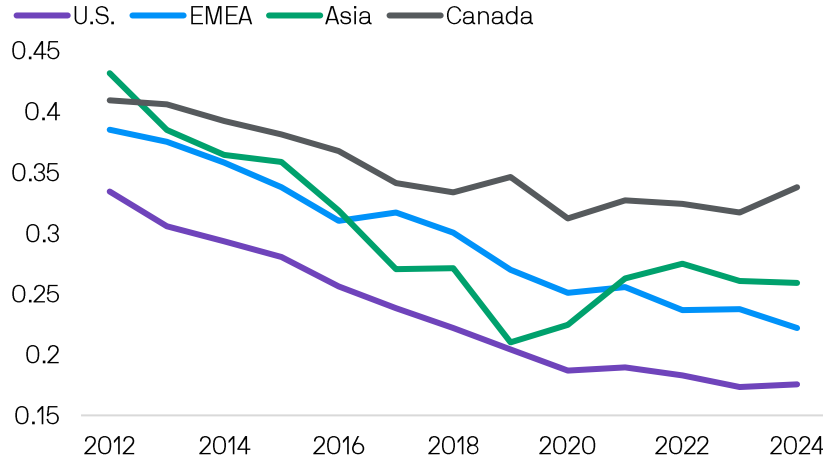
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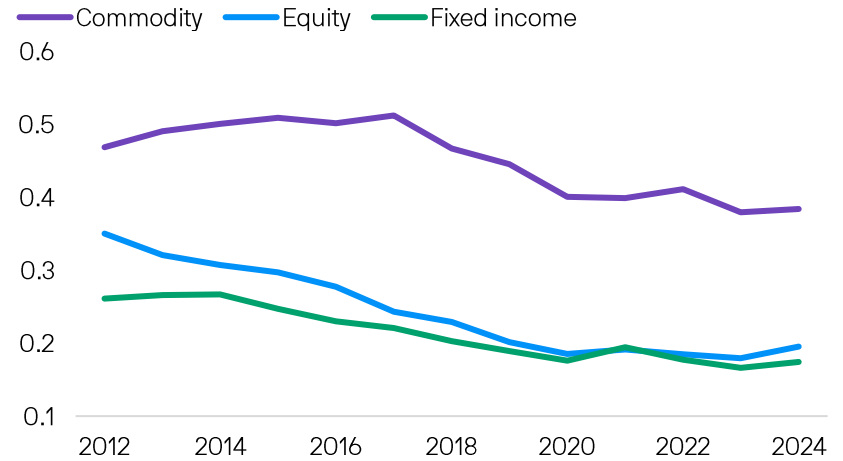
Understanding ETF fees over time

GTE	U.S.	35
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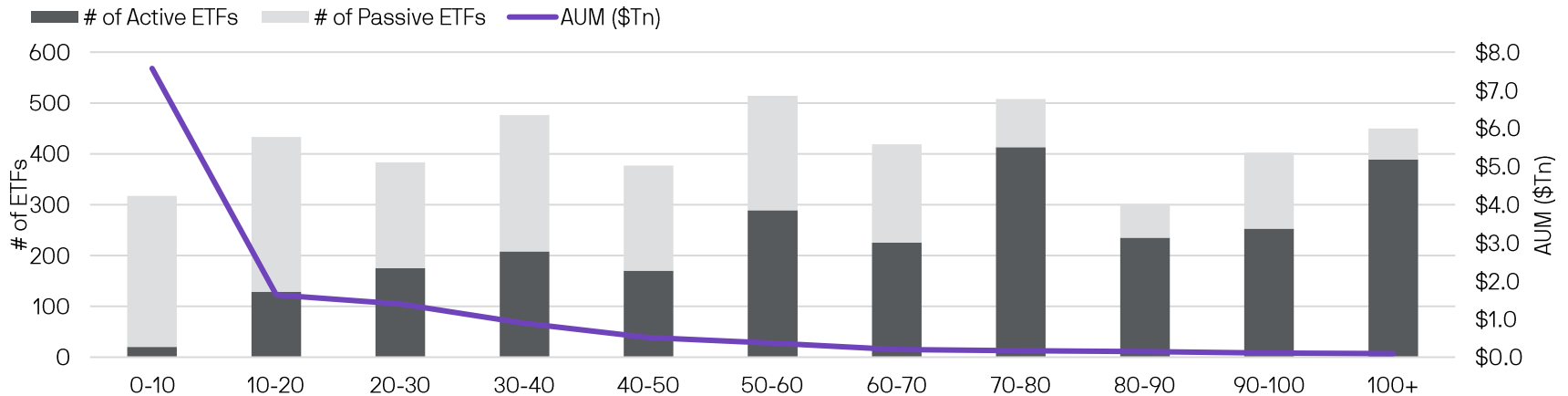
AUM-weighted average fees, by region



AUM-weighted average fees among global ETFs, by asset class



U.S. ETF assets, by fee band



Source: Top left and right graphs: 2024 JPMorgan ETF Handbook; J.P. Morgan Quantitative and Derivatives Strategy, Bloomberg Finance L.P. Data points as of May of each respective year. Bottom graph: J.P. Morgan Asset Management, Bloomberg. Guide to ETFs – U.S. Data as of October 31, 2025.



Why ETF model portfolios are on the rise

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Benefits of models



Investment Management Expertise



Business Scalability



Diversification



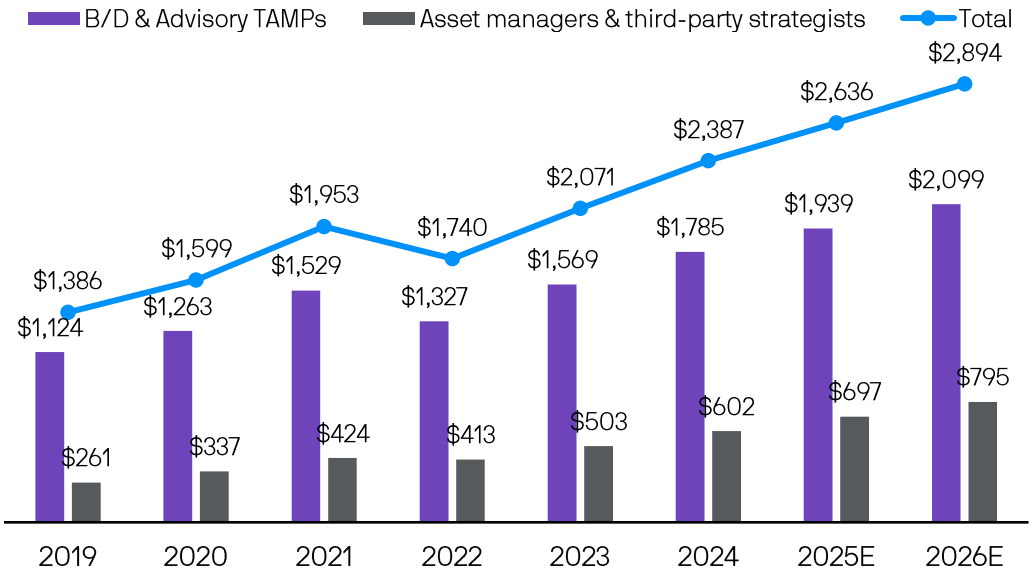
Time-saving



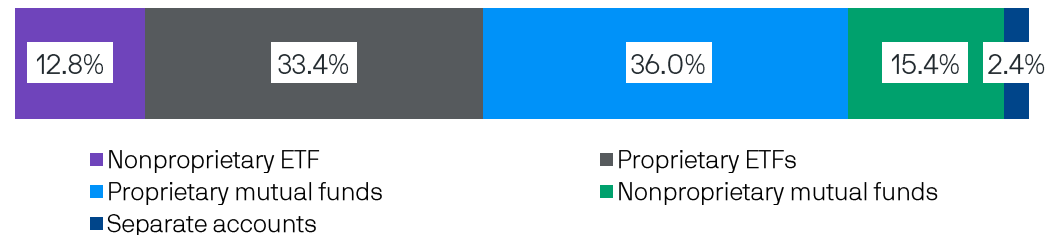
Due Diligence

Trends

Asset allocation model portfolios asset projection, 2019 – 2026E



Asset-weighted average model allocation to investment vehicle type



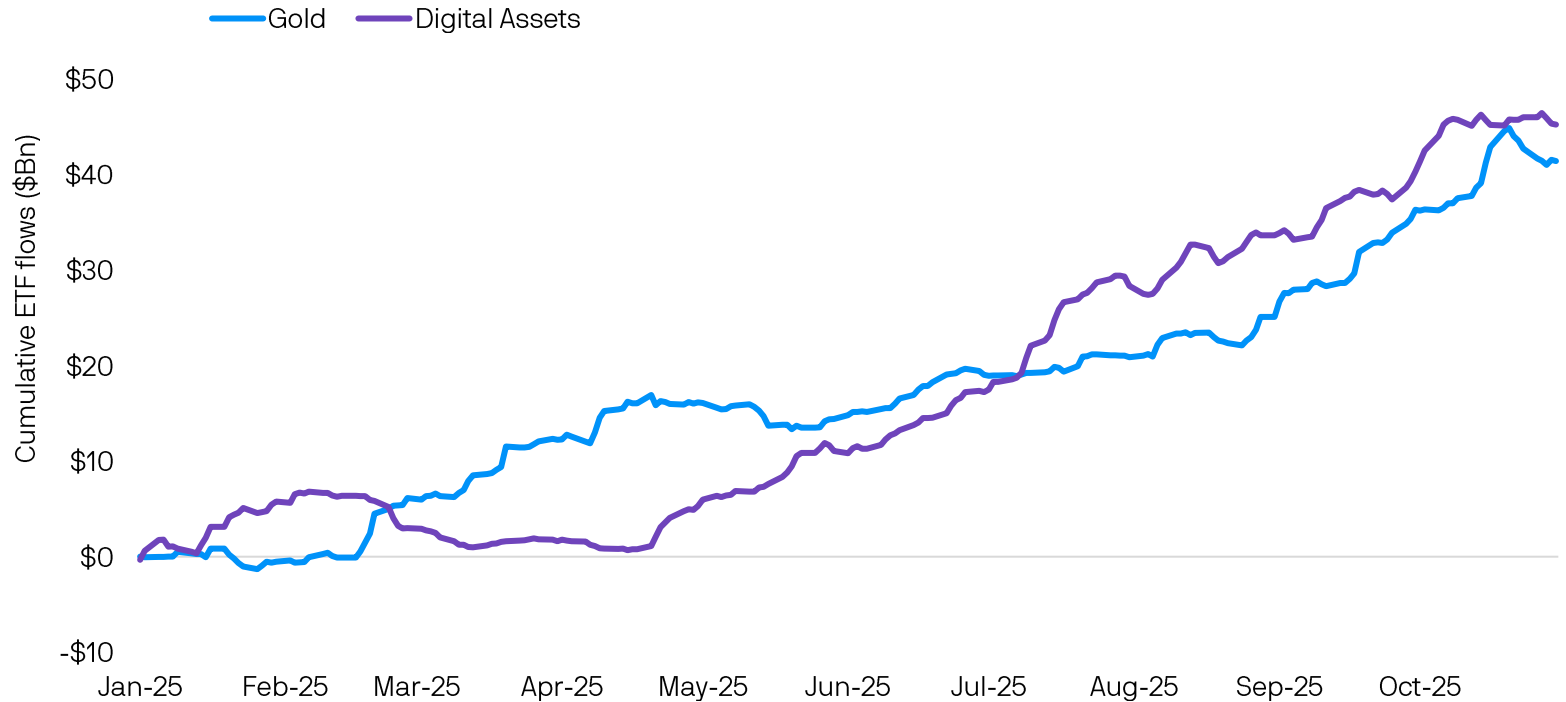
Source: J.P. Morgan Asset Management, Cerulli Associates, U.S. Asset Allocation Model Portfolios 2024. Bottom Right: Cerulli Associates, 2024. For illustrative purposes only.
Guide to ETFs – U.S. Data as of October 31, 2025.



Digital currency and gold ETFs flows

Trends

Currency flows in 2025



	January	February	March	April	May	June	July	August	September	October
Gold Monthly Flow	-531	6,691	6,186	3,679	-1,617	5,024	1,622	4,050	10,270	6,044
Digital Asset Monthly Flow	5,797	-2,734	-1,220	3,118	6,184	6,298	11,973	4,296	5,822	6,033

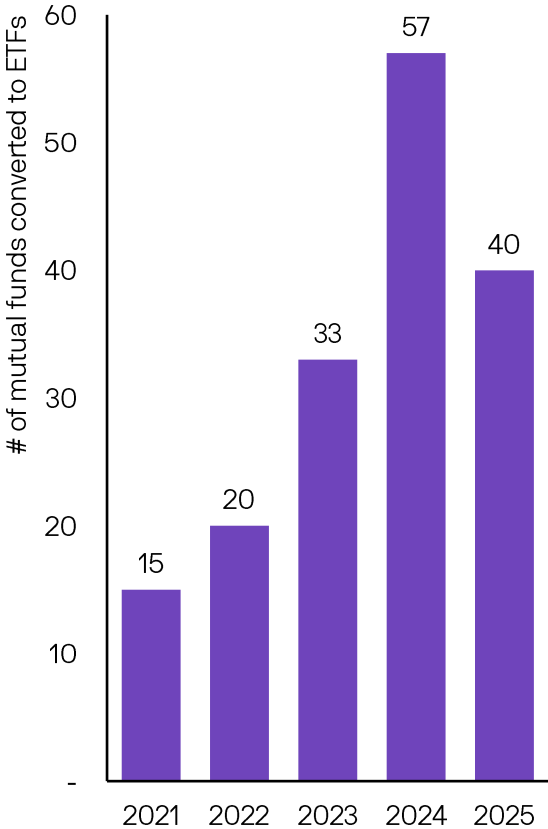
Source: Bloomberg, Morningstar, J.P. Morgan Asset Management. Digital Assets represented by all ETFs in the digital assets Morningstar category.
Guide to ETFs – U.S. Data as of October 31, 2025



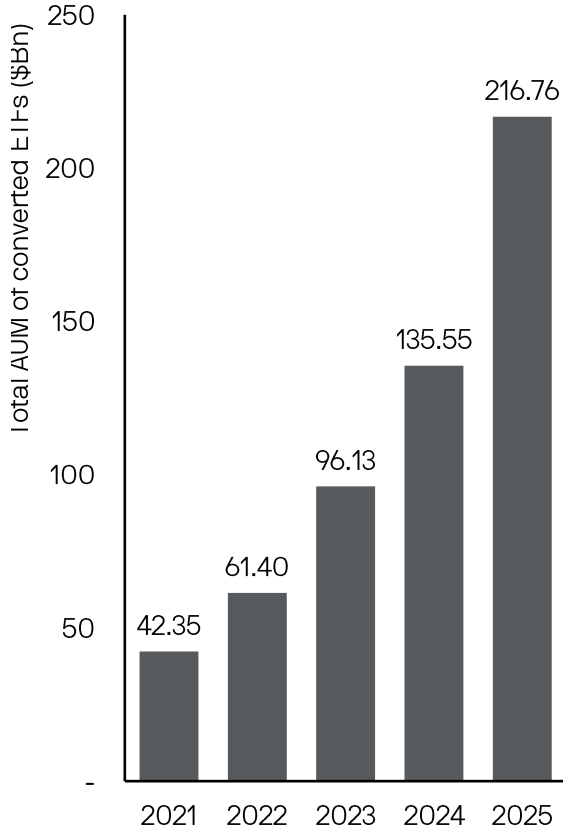
Mutual fund to ETF conversions

Trends

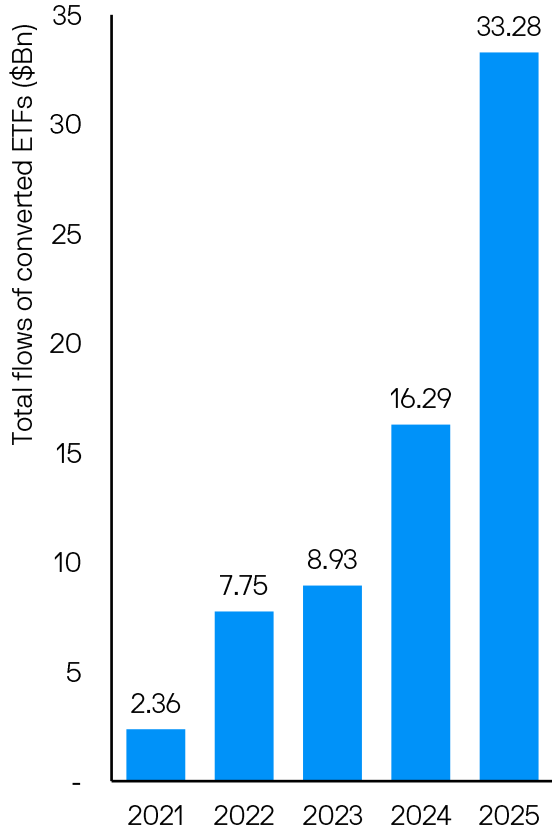
Mutual fund to ETF conversions, by year



Total assets in converted ETFs



Total flows into converted ETFs



Source: Morningstar, J.P. Morgan Asset Management.
Guide to ETFs – U.S. Data as of October 31, 2025.



Investment vehicle comparison

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	ETF	Mutual Fund	Separately Managed Account
Diversification	Broad portfolio typically has many stocks or bonds	Broad portfolio typically has many stocks or bonds	May be limited to the size of the account
Tradability	Can buy or sell shares on an exchange, throughout the day	Can buy or sell shares directly through the mutual fund company or brokerage account, at the end of the day	Can buy or sell assets directly through the management company, typically on a best-efforts basis
Access to assets	Throughout the day	End of day	Throughout the day
Tax efficiency	Capital gains are generally triggered by the individual when they sell their shares of the ETF	Capital gains are triggered by the fund manager as gains are realized through sell transactions inside the fund	Typically, capital gains or losses can be managed to investor's needs
Fees	Expense ratio, plus possible trading costs	Expense ratio, including 12b-1 fees, plus possible sales charge	Typically based on a percentage of account assets
Direct ownership of securities	No	No	Yes
Portfolio customization	No	No	Yes



ETF characteristics and benefits

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Transparent

- Daily holdings disclosure leads to more visibility of underlying securities, *better pricing during market stress and tighter spreads*



Liquid

- Exchange trading provides *intra day liquidity*
- Constant bid/ask prices enhance *price discovery*, especially in illiquid market segments



Cost-effective

- One fee structure, lower expense ratios and operational innovations translates to *lower costs* for investors



Tax-efficient

- Secondary market activity assists in *lowering portfolio turnover*
- In-kind redemptions capabilities may help *reduce taxable trading activity*



Accessible

- Provides access to diverse asset classes that may or may not be easily available to all investors, whether active or passive, with *no minimum investment thresholds*

Source: J.P. Morgan Asset Management. For illustrative purposes only. Investors must buy and sell units on a secondary market with the assistance of an intermediary (e.g. a stockbroker) and may incur fees for doing so. In addition, investors may pay more than the current net asset value when buying units and may receive less than the current net asset value when selling them. The tax treatment depends on the individual circumstances of each client and may be subject to change in the future.
Guide to ETFs – U.S. Data as of October 31, 2025.



ETF transparency allows investors to know what they own

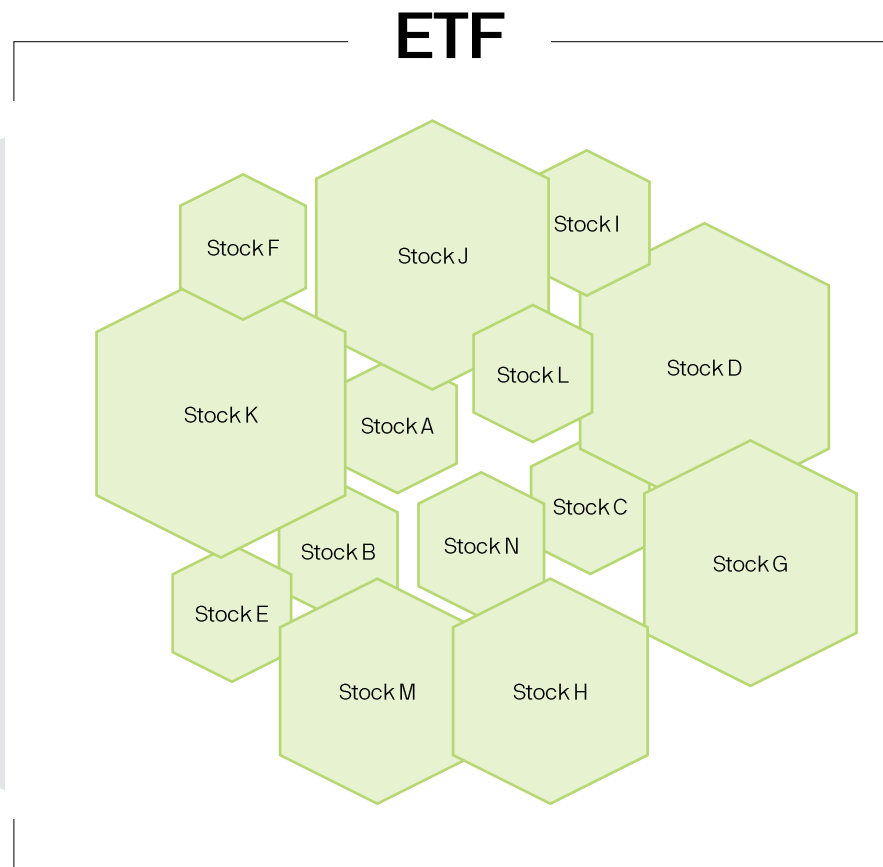
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ETF transparency allows:

- Better understanding of portfolio holdings/portfolio overlap
- Ability for daily performance attribution
- Tighter bid/offer spreads





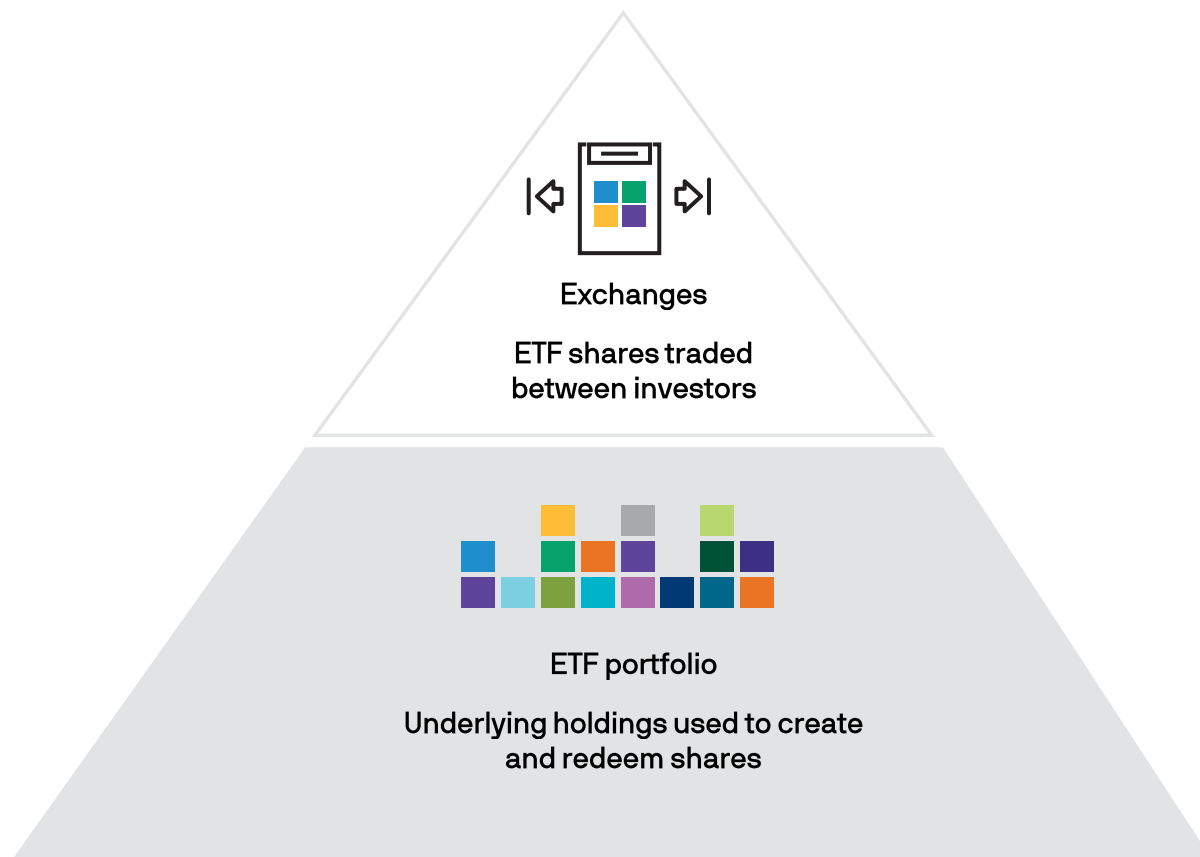
ETFs offer more liquidity than meets the eye

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Morningstar U.S. active equity large cap value ETF category (73 active ETFs)



Average daily trading volume
\$4.6Mn

+

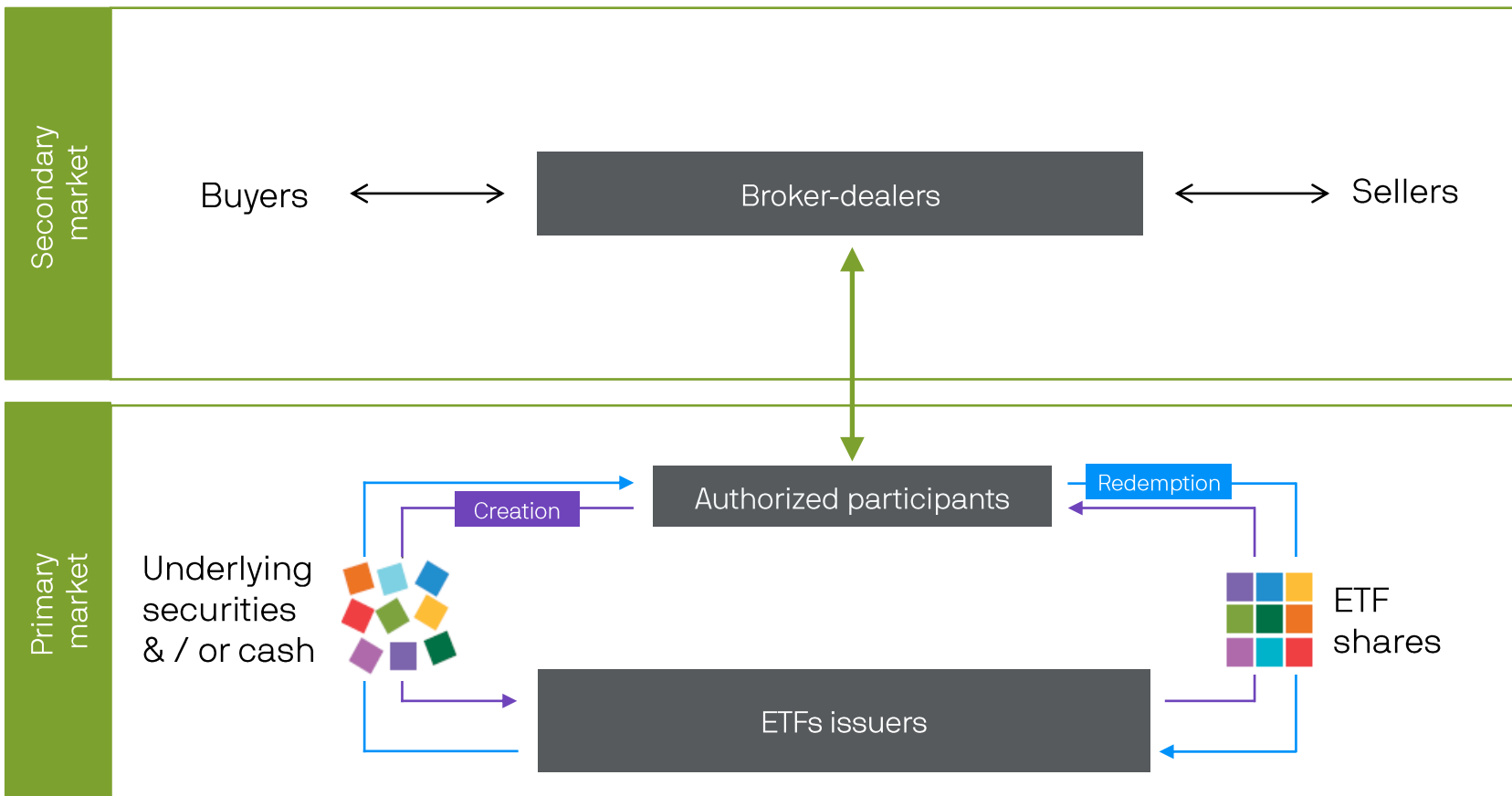
Average daily trading volume
\$5.9Bn

Source: Bloomberg, J.P. Morgan Asset Management; as of September 30, 2025. Top of the pyramid represents the average of the 3-month period average daily volume (ADV) for the 73 active ETFs in the category ending September 30, 2025. The bottom of the pyramid represents the average of the 3-month period ADV of the underlying baskets for the 73 active ETFs in the category ending September 30, 2025. For illustrative purposes only.
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How liquidity is brought to investors

Creation and redemption process across active and passive ETFs





Market stress highlights ETFs' liquidity powers

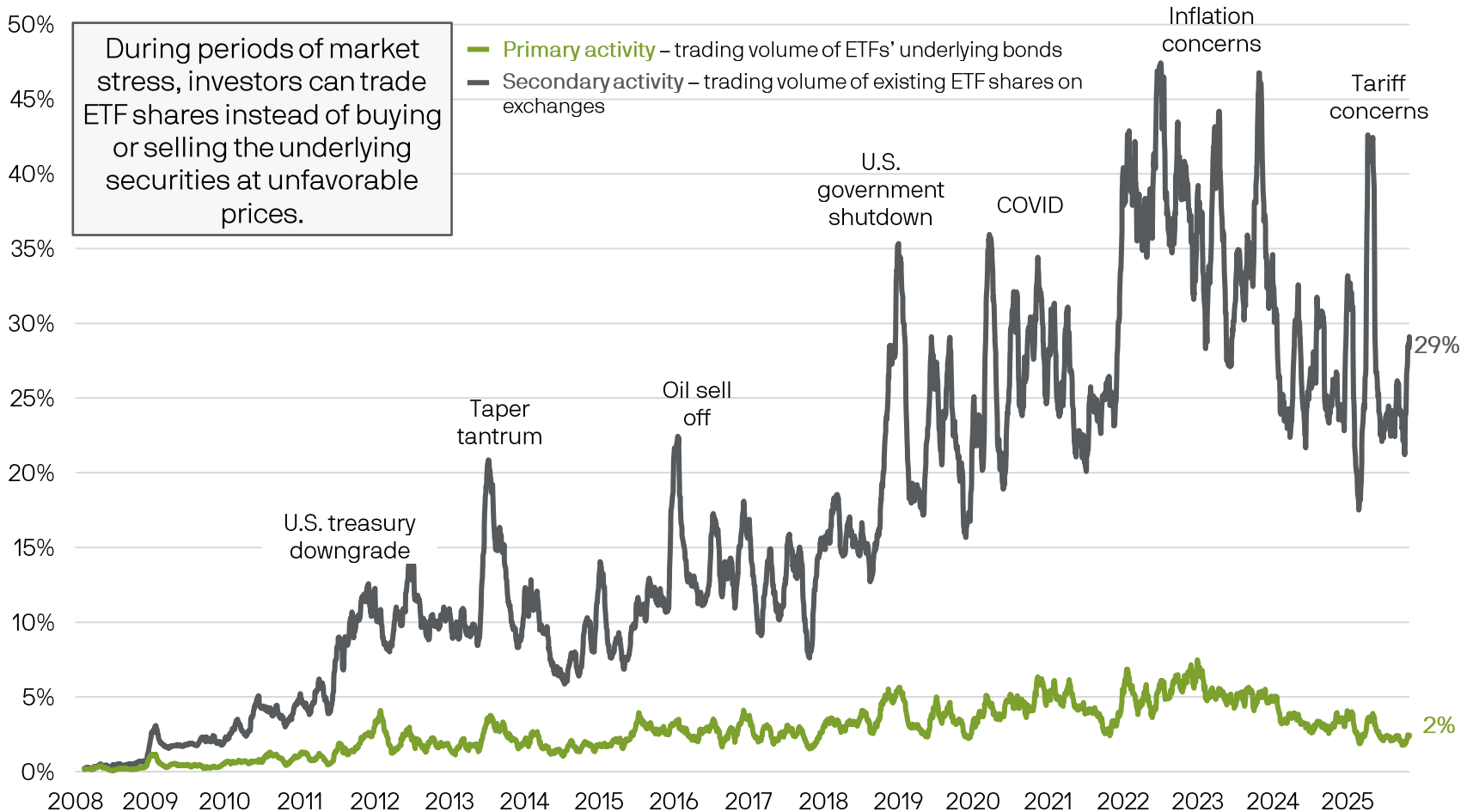
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High yield ETF trading volume in periods of market stress

Share (%) of 20-day rolling average trading volume of overall high yield bond market





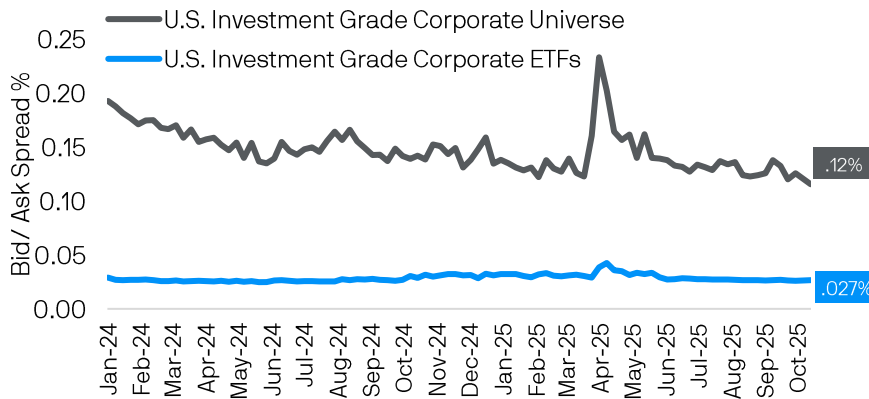
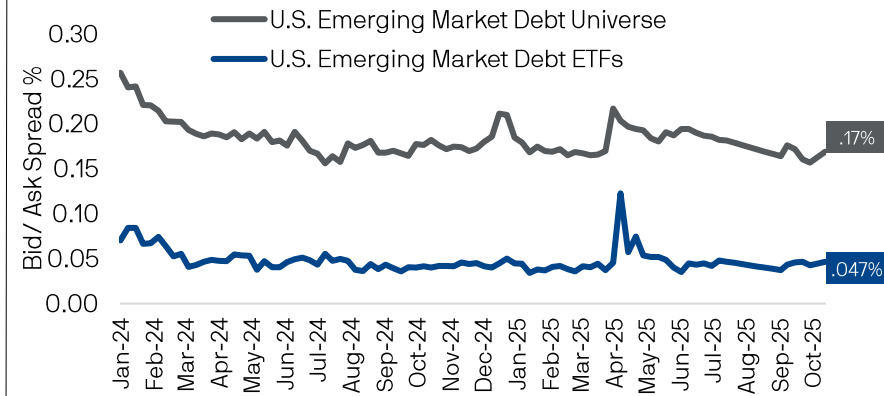
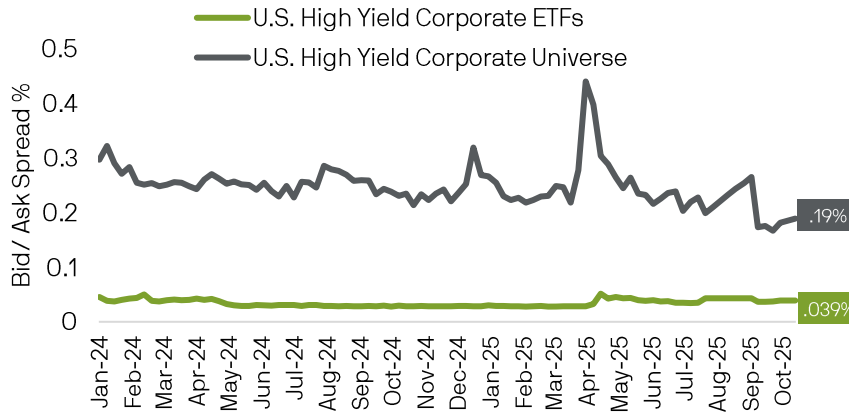
Cost Benefits of ETFs

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ETFs historically have tighter spreads than the underlying bonds



Underlying high yield securities trade on average **7.2x wider** compared to overall ETF



Underlying emerging market securities trade on average **3.8x wider** compared to overall ETF



Underlying investment grade securities trade on average **5.2x wider** compared to overall ETF

Source: Bloomberg, MarketAxess, J.P. Morgan Asset Management. High Yield (HY) Corporate ETFs represented by the top 10 HY ETFs by AUM in the Morningstar High Yield category. Emerging Market Debt (EMD) Corporate ETFs represented by the top 5 EMD ETFs by AUM in the Morningstar EMD category. Investment Grade (IG) Corporate ETFs represented by the top 10 IG ETFs by AUM in the Morningstar IG category. Data as of October 20, 2025.

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Commons basket types used for creations and redemptions

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Under the ETF Rule (SEC 6c-11), issuers have the flexibility to publish up to 6 different baskets, to be used by Authorized Participants (AP) to create or redeem ETF shares, to meet specific business objectives. With the exception of the standard basket, the others are considered *custom baskets*.

Standard

Required to be published every day. Can be pro-rata or optimized and may be used for creations or redemptions

Create

Typically optimized to improve liquidity or minimize transaction costs

Redeem

Typically optimized to improve liquidity, minimize transaction costs or to improve tax efficiency

Rebalance

Typically used for more efficient portfolio rebalancing which can also lead to improved tax efficiency

Restricted

Similar to a Rebalance basket, but often restricted to a single AP

Negotiated

The only basket published intraday. Normally, an optimized basket of fixed income securities negotiated between AP and portfolio managers



Negotiated basket workflow for fixed income ETFs

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Creation example

Market maker

1 Proposes a list of bonds in inventory or that they can easily source

4 Accepts or rejects proposed basket and can provide an alternative basket for consideration

Inventory

Proposed basket

ETF portfolio manager

2 Determines which of those bonds fit in the portfolio based on pre-established criteria

3 Proposes a creation basket that combines cash and the selected bonds



Transaction often targets constant shape of the portfolio (duration, spread, sector)



Technology often aids the negotiation process



Enhanced tax efficiency through redemption baskets

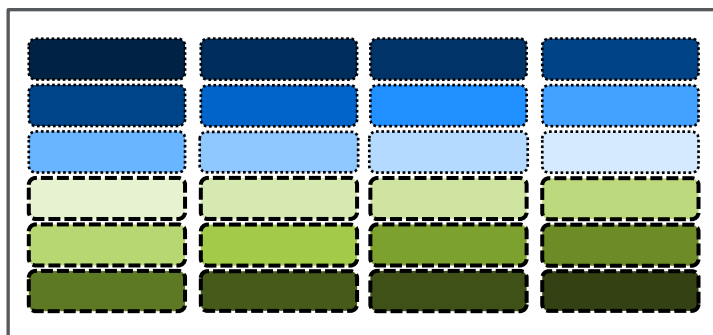
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The use of a redemption basket in lieu of a standard basket for primary market activity may lead to greater tax efficiency

Standard basket

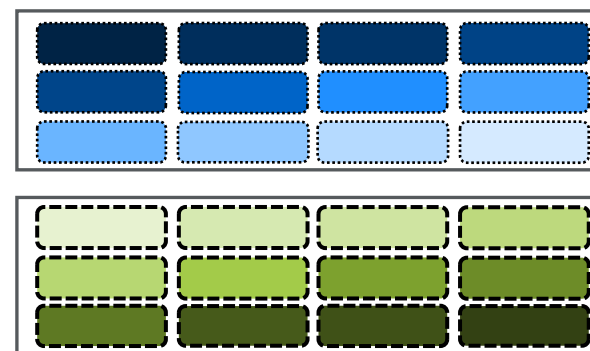


 Securities with unrealized gains

 Securities with unrealized losses

Redemption basket

OR



In-kind

Cash in
lieu

Standard basket

- ❑ In-kind, pro-rata slice of the portfolio
- ❑ Cash component of the basket is minimized

Redemption basket

- ❑ Issuer can in-kind out securities with unrealized gains
- ❑ Securities with losses can be sold for cash to crystallize losses and offset realized gains in the portfolio



Tax efficiency spectrum across mutual funds and ETFs

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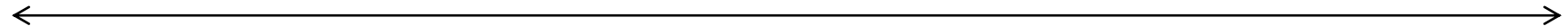
ETF wrapper allows for greater tax efficiencies than the mutual fund wrapper for two main reasons:

- ETFs trade on exchange, allowing shares to exchange hands without the need for trading the underlying portfolio
- ETFs that redeem in-kind can transfer securities out of the portfolio to meet the redemption, as opposed to having to sell holdings to raise cash



Potential for less capital gains

Potential for more capital gains



Passive ETFs

- + Trade on exchange
- + Lower portfolio turnover
- + Shares are often created / redeemed in-kind

Active ETFs

- + Trade on exchange
- Higher portfolio turnover
- + Shares are often created / redeemed in-kind

Passive mutual funds

- No exchange trading
- + Lower portfolio turnover
- Shares are created / redeemed in cash

Active mutual funds

- No exchange trading
- Higher portfolio turnover
- Shares are created / redeemed in cash



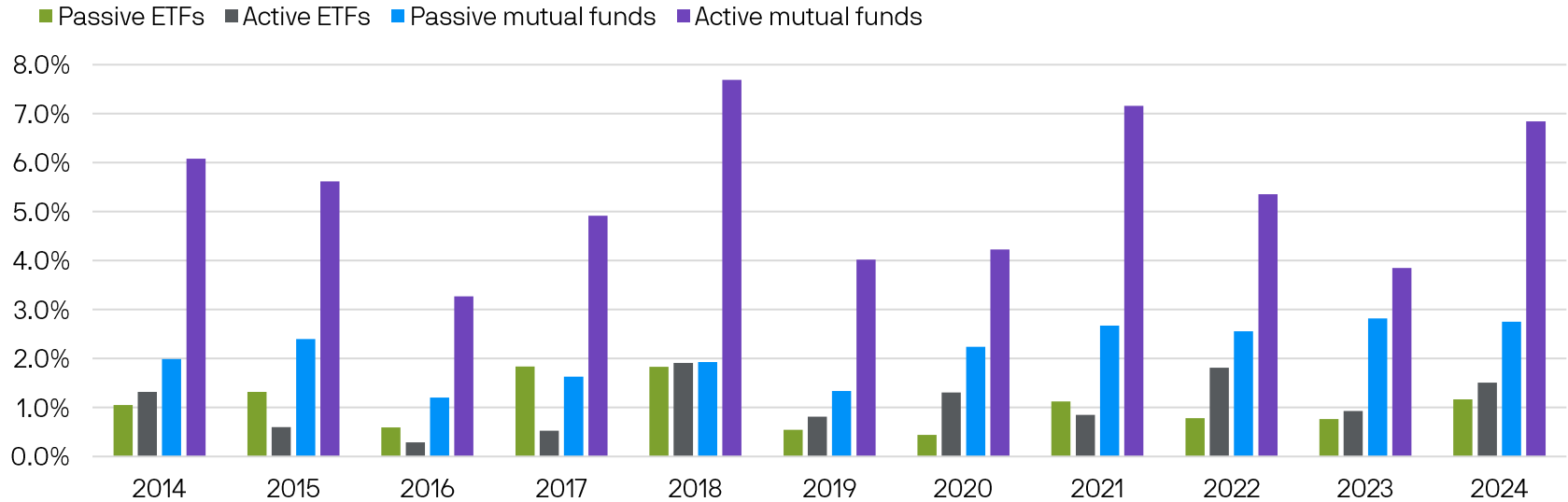
Percentage of funds paying capital gains in calendar year

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Weighted average of % capital gains / net asset value (NAV)



% of funds paying capital gains by year

Fund type	# of funds that paid capital gains in 2024	Total # of funds in 2024	% in 2024	% in 2023	% in 2022	% in 2021
Passive ETFs	32	1,898	1.7%	1.2%	2.3%	8.4%
Active ETFs	107	1,230	8.7%	4.7%	8.0%	13.8%
Passive mutual funds	147	436	33.7%	23.7%	34.1%	54.3%
Active mutual funds	2,104	5,364	39.2%	28.5%	42.4%	61.5%

Source: Morningstar, J.P. Morgan Asset Management. Cost basis is the original purchase price used to determine capital gains and losses. Unrealized gain is the profit, if any, on a security that has not been sold (current price minus cost basis). Data as of December 31, 2024. Products are U.S. only.
Guide to ETFs – U.S. Data as of October 31, 2025.



ETF trading considerations – a communication story

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Select order type that is suitable for your needs:

Not-Held Order

Gives trading authority to a broker or trading desk

Designed to: Access trading experts, potential to engage in various trading methods, but communication could lead to delay in execution

Appropriate for: Orders that account for higher % of volume

Limit Order

Allows you to set the max and min price for buying/selling shares

Designed to: Achieve desired price, but not guaranteed to complete

Appropriate for: Orders that account for lower % of volume

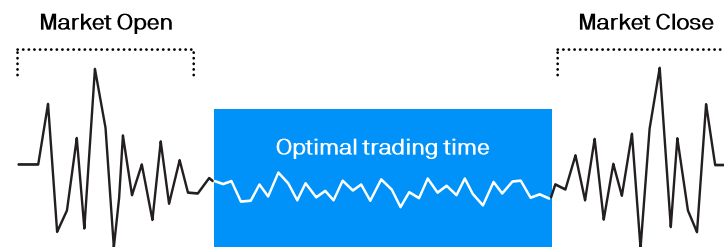
Market Order

A request to trade immediately at the best available price

Designed to: Complete at any cost with potential impact to price

Appropriate for: Orders for share quantities smaller than displayed quantities

Tips to help avoid suboptimal trade execution:



- Avoid trading during market open/close
- Additional liquidity may be had in foreign markets when those markets are open
- Be cognizant of holiday calendar globally, as well as economic release schedule
- Pay attention to the consistency of the secondary market volume for ETF shares



Ability for ETFs to absorb large trades

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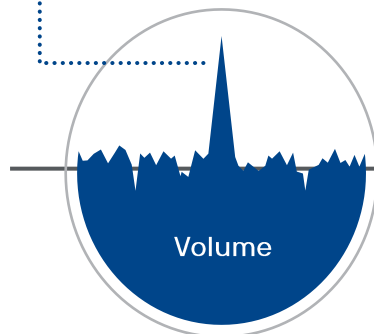
ETFs can move larger dollar amounts without moving markets when the underlined securities are leveraged to provide liquidity

Fixed income ETF example

6,998,000
Shares traded

31x
Average daily
trading volume

21%
of the ETF's AUM



Bid/Ask spread

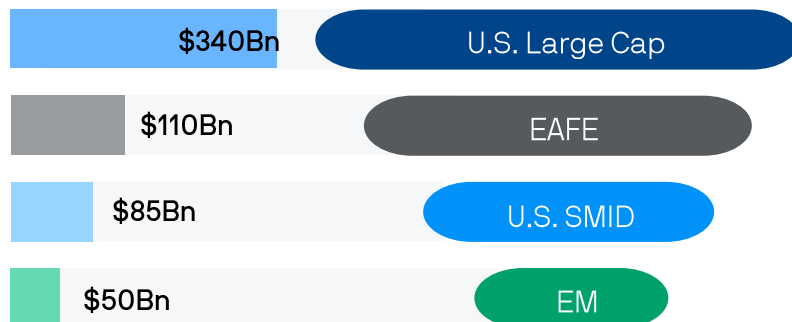
Regardless of the volume, the bid/ask spread remains virtually unchanged and the ETF remains liquid.

An investor sold out 21% of a fixed income ETF which represents 31 times its average daily trading volume to purchase another fixed income ETF.

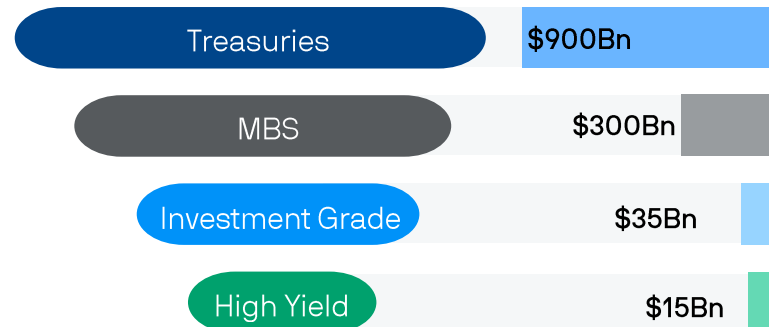
The ETF purchased was able to absorb the trade with no noticeable impact on the market.

Underlying liquidity* of the asset class is an important component

Equities



Fixed Income





ETF total cost of ownership

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$$\text{Holding costs} + \text{Trading costs} = \text{Total cost of ownership}$$

+ Expense ratio/Fee

+ Portfolio turnover

— Securities lending

+ Trading commissions

+ Bid-ask spread

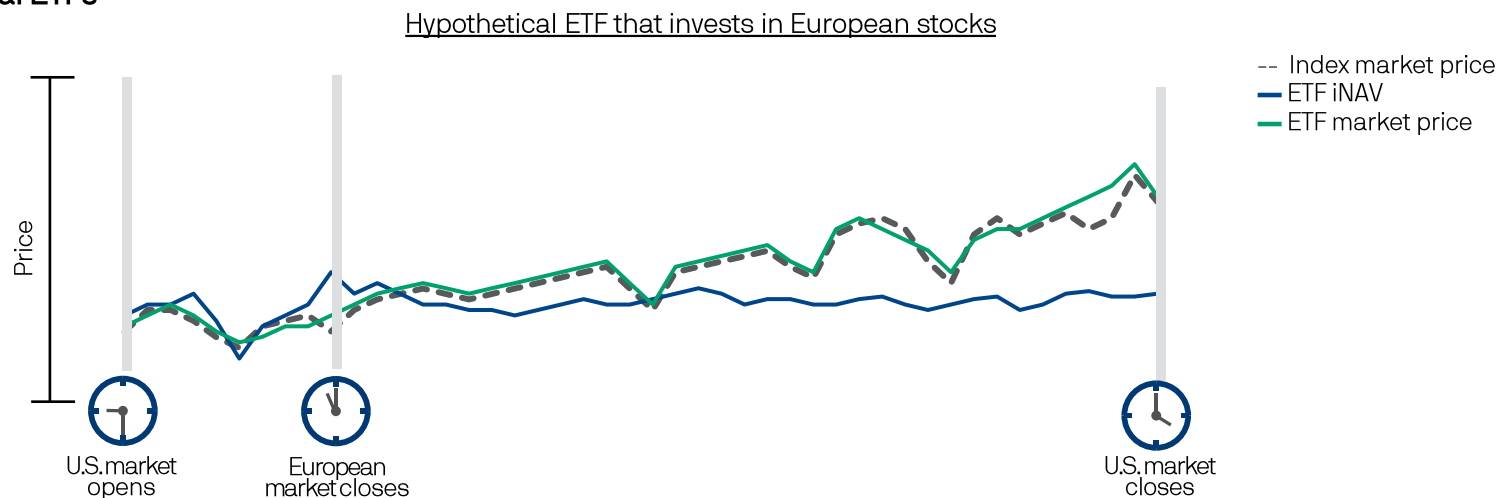
+ Tax impact

+ Adds to total costs — Reduces total costs

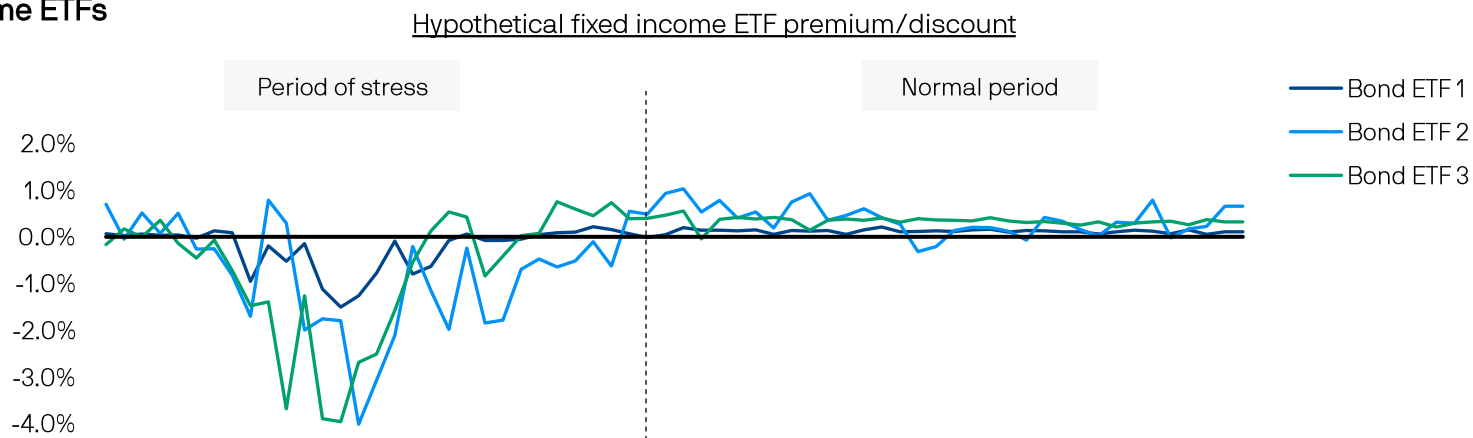


ETF premiums and discounts

International ETFs



Fixed income ETFs



Source: J.P. Morgan Asset Management. For illustrative purposes only. The manager seeks to achieve the stated objectives. There can be no guarantee the objectives will be met.
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J.P. Morgan Asset Management – Risks & disclosures

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