


AIM 01

Exchange-traded products: Market overview

1



Exchange-traded products

- Purpose:
 - Describe ETP market in broad terms.
 - What are ETPs?
 - Why were ETP markets created?
 - What are types of ETPs?
 - ETF vs ETN
 - How are ETPs categorized?
 - Replication strategy – How is benchmark return earned?
 - Underlying market risk factor – What is benchmark index?
 - What are reasons for market success?
 - What is current landscape?
 - Market value of asset categories
 - Key benchmark indexes within each category

2

What are ETPs?

- ETPs are like mutual funds.
 - Pool investor funds to gain market price risk exposures (e.g., stock market, bond market).
 - Provide means for trading and/or investing.
 - Traders speculate on price moves on hold for short periods (e.g., day-traders).
 - Investors buy-and-hold for long periods after considering expected returns and risks of investment alternatives.

3

Why were ETP markets created?

- ETPs were intended to supplant index mutual fund (IMF) industry.
- ETPs have two key advantages.
 - Trading: ETPs actively trade throughout trading day. IMFs trade only at close.
 - Transparency: ETFs voluntarily report holdings daily. IMFs are required to report quarterly but have 30 to do so.

4

What are types of ETPs?

- Two types of ETPs:
 - Exchange-traded funds (ETFs)
 - Exchange-traded notes (ETNs)
- Both are traded on U.S. stock markets and regulated by SEC.

5

ETF characteristics

- ETFs are like open-end index mutual funds (IMFs).
 - Both are investment companies and fall under the Investment Act of 1940.
 - Requires transparency. Portfolio holdings are published.
 - Both are passive index investments.
 - Buy and hold underlying benchmark index securities. (e.g., stocks and bonds).
 - Both are open-ended.
 - Individual buys fund, and fund buys securities.
 - Individual owns securities, but fund has voting rights.

6

ETN characteristics

- ETNs are unsecured debt obligations (notes) issued by financial institutions.
 - Promise to pay daily return on reference asset (e.g., benchmark index).
 - Do not own underlying securities.
 - Backed by credit of issuer.
 - Have default risk.
 - Are regulated under Securities Act of 1933.
 - No disclosure of holdings is required.

7

ETP categorizations

- ETPs can be categorized by:
 - Replication strategy
 - Hold benchmark index securities (physical asset).
 - Hold collateralized futures position (futures on asset).
 - Benchmark asset
 - Stocks – CRSP total market index or S&P total market index
 - Bonds – Bloomberg Barclays U.S. aggregate bond index
 - Commodities – Single commodities or commodity index
 - Volatility – VIX short-term futures index

8

Reasons for market success

- Three primary reasons for success of ETPs:
 - Low expense ratios
 - Low-cost trading
 - Easy access to market price risk exposures

9

Low expense ratios

- Expense ratio (*ER*) measures cost of investing.
 - Quoted in basis points per annum (bps).
 - Include management fee as well as operating costs.
 - Applied each day as:

$$ER \times \left(\frac{\# \text{ of days}}{365} \right)$$

- ETP *ER*'s are small relative to alternatives.
 - Total stock and bond market ETFs: 3 bps
 - Actively managed mutual funds: 150 bps
 - Hedge funds: 200 bps plus 20% of gains

10

Low-cost trading

- ETPs trade in stock markets.
 - Accessible to virtually everyone.
 - Commission-free trading.
 - Markets are liquid.
 - Common measures of market liquidity are:
 - Trading volume
 - Bid/ask spread

11

Easy access to price risk exposures

- ETPs provide means of trading/investing in market risk exposures not otherwise possible.
- Consider small investors (i.e., retail customers).
 - Can now invest in diversified stock and bond portfolios.
 - Did not have wealth to diversify on their own.
 - Lever investments through levered funds.
 - Short sell inverse funds.

12

Easy access to price risk exposures

- Consider large investors (i.e., institutions).
 - Can now investing in commodities or volatility.
 - Remove trading restrictions.
 - Many institutions are barred from trading in commodity and volatility futures markets by charter.
 - Buying commodity ETPs provides commodity futures price risk, thereby circumventing rule.
 - Many institutions are barred from short sales.
 - Buying inverse ETPs provides short price risk exposure, thereby circumventing rule.

13

Product evolution

- First generation of ETPs used full replication investment strategies to generate benchmark returns.
 - Hold all securities in benchmark index.
- First ETF launched in the world was in 1989.
 - TIPs: Toronto Stock Exchange Index Participations
 - BlackRock took over 19990928.
 - XIU: iShares S&P/TSX 60 Index

14

Product evolution

- First ETF in US launched in U.S. was in 1993.
 - SPY: Standard and Poor's Depository Receipt (SPDR) on S&P 500 index.
 - American Stock Exchange took four years to get SEC approval.
 - Now administered by State Street Global Advisors (SSGA).
 - SPY is most actively traded security in US.

15

Product evolution

- Late 1990s: SSGA through SPDRs launched tactical or thematic replication funds on:
 - Other major U.S. stock indexes (e.g., Dow, QQQ)
 - Sector indexes (S&P 500 has 11 sectors)
 - Emerging market indexes

16

Product evolution

- 2002-3: BlackRock launched first non-stock index (replication) funds.
 - Bond indexes depend on interest rate risk and credit risk.
 - Risks can be separated through tactical funds.
- 2004: SPDR launched first commodity ETF (GLD).
 - ETF on physical gold

17

Product evolution

- Mid 2000s: Move from physical replication to cash/futures replication.
 - Funds do not use actual replication securities.
 - Second generation ETPs use fully collateralized futures (FCF) positions to generate benchmark returns.
 - Funds do not use actual replication securities.
 - Instead, they hold cash and equivalent notional amount of futures on benchmark (i.e., fully collateralized).
 - Third generation ETPs use (not fully) collateralized futures positions to generate benchmark returns.
 - Hold cash and larger notional amount of futures on benchmark (e.g., 2x, 3x).

18

Product evolution

- 2006: First FCF collateralized futures ETP (2nd) launched.
 - USO was intended to mimic return/risk characteristics of investment in crude oil.
 - Idea was to create new asset class.
 - Traditional asset classes are stocks, bonds, and cash equivalents.

19

Product evolution

- 2006: First levered and inverse funds (3rd) launched.
 - Leverage ratio denoted Lx .
 - Fund holds cash and L times notional amount of futures.
 - First levered and inverse funds were $2x$ and $-1x$ on S&P 500 and Dow.
 - Designed to circumvent borrowing constraints and short selling restrictions.

20

Product evolution

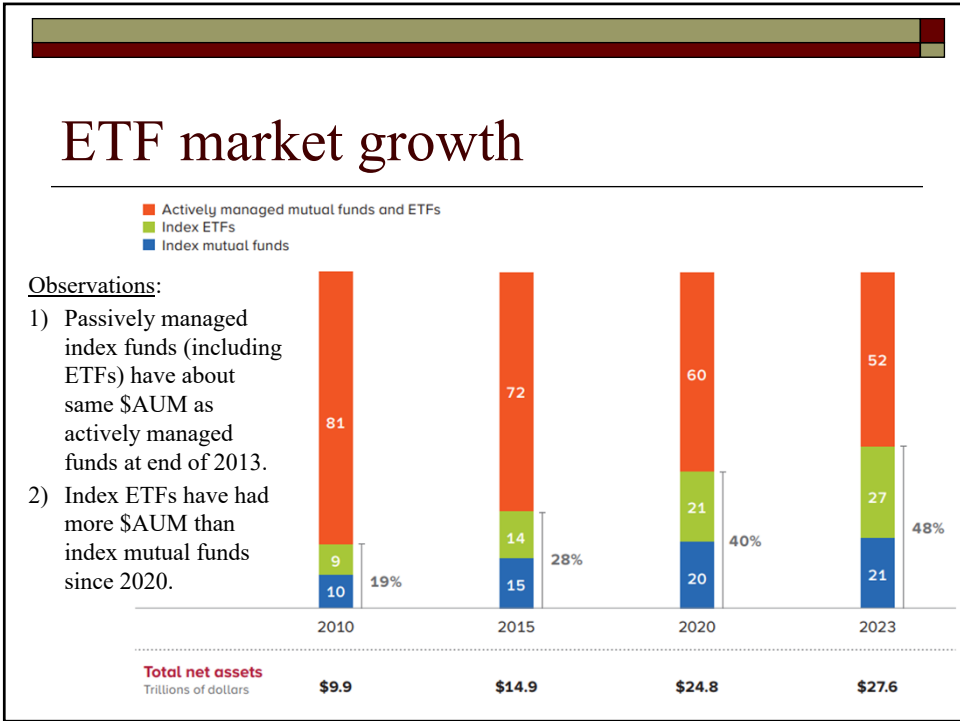
- 2009: Second generation funds move from commodities to volatility.
 - VIX CBOE volatility index
 - Designed to create new asset class.
 - Traditional asset classes are stocks, bonds, and cash equivalents.
 - Levered and inverse (L&I) volatility ETPs followed.
- 2021: BITO – Fully collateralized bitcoin futures ETF.
- 2024: Simultaneous launch of 10 full replication (spot) ETFs.

21

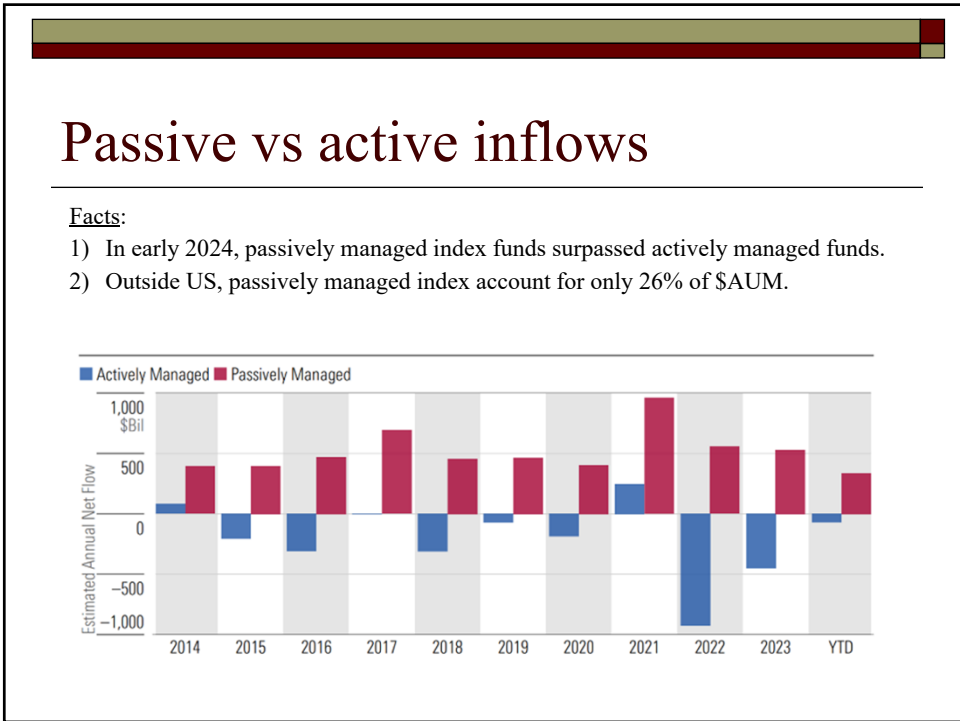
Fund size

- Fund size is measured as sum of dollar value of assets under management (\$AUM) across all ETPs.
 - \$AUM for single fund is sum of values of individual security holdings.
 - Different from dollar market value (\$MV), i.e., market price per share times # of shares outstanding.
 - In frictionless markets, \$AUM = \$MV.

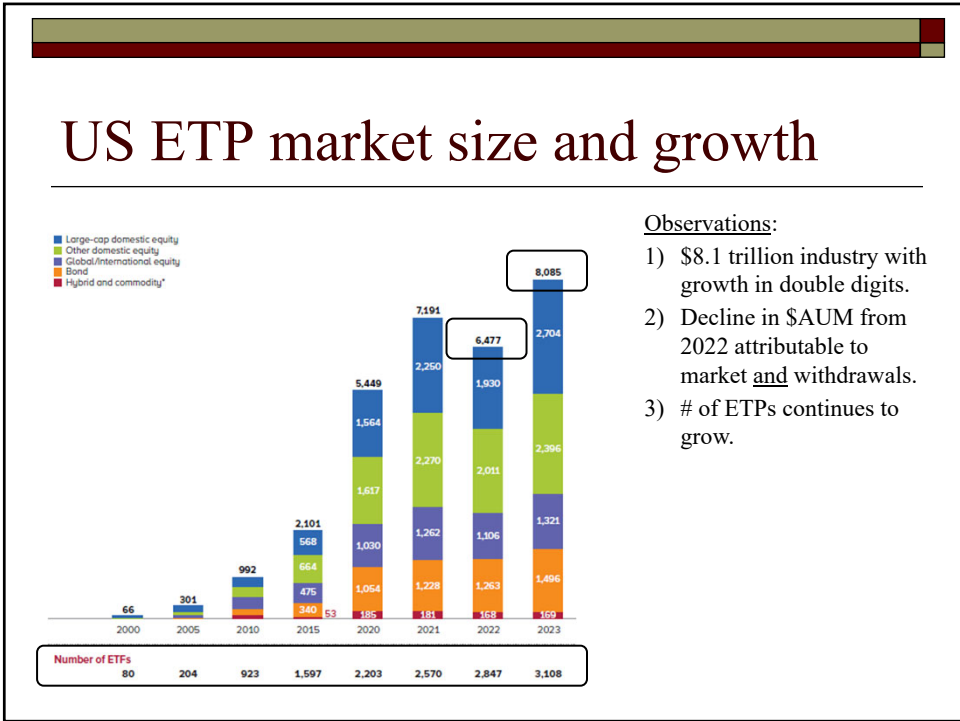
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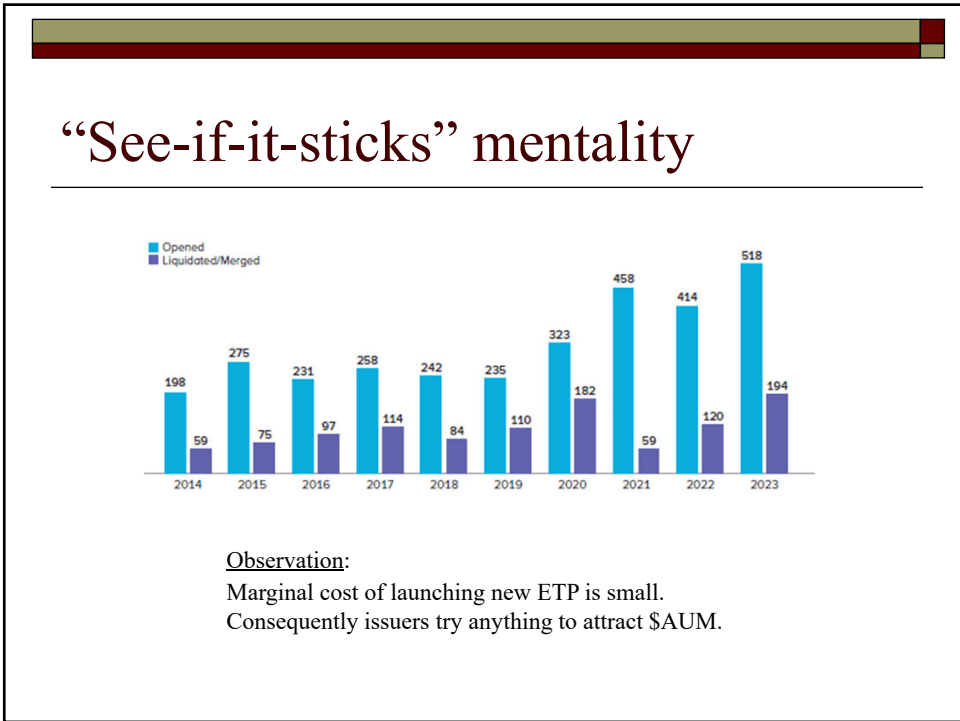
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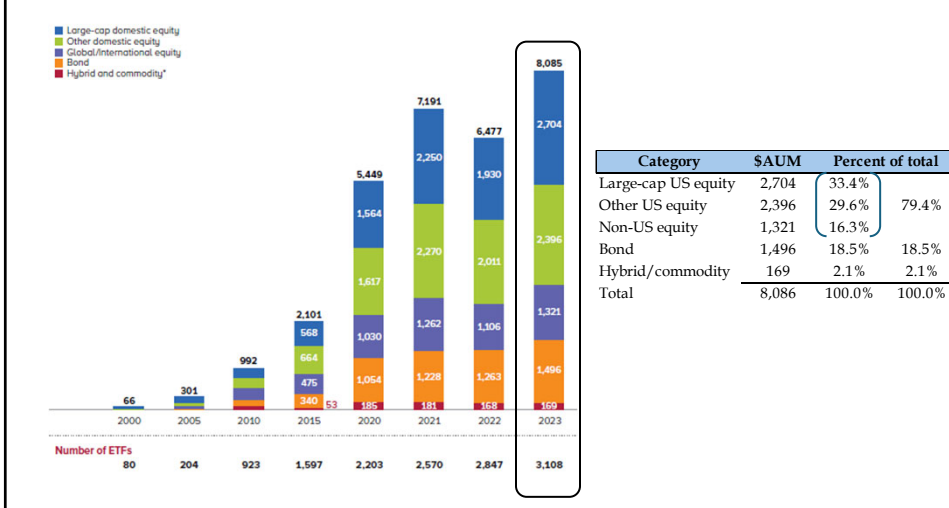


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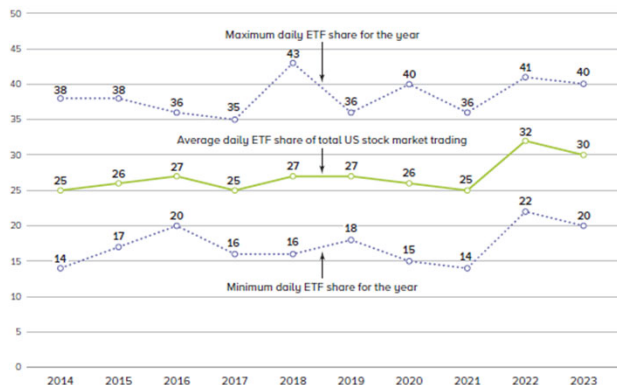
26

\$AUM by asset category



27

ETP trading activity



Observation: On typical day, ETP trading currently accounts for 30% of Stock market volume.

28

ETP market

- Summaries of ETP market activity can be obtained from various sources.
 - Downloaded information for US ETPs from ETFdb.COM as of 20231229.
 - [Support file: AIM ETF report generator 20231229.xlsx](#)

29

Descending order of \$AUM (2022)

Top 10 ETPs by \$AUM in millions						
Symbol	Name	Asset class	\$AUM	Cumul. %	Inception	ER
SPY	SPDR S&P 500 ETF Trust	Equity	353,479	5.5%	19930122	0.09%
IVV	iShares Core S&P 500 ETF	Equity	285,474	9.9%	20000515	0.03%
VOO	Vanguard S&P 500 ETF	Equity	258,367	13.9%	20100907	0.03%
VTI	Vanguard Total Stock Market ETF	Equity	256,768	17.9%	20010524	0.03%
QQQ	Invesco QQQ Trust	Equity	143,493	20.1%	19990310	0.20%
VEA	Vanguard FTSE Developed Markets ETF	Equity	99,577	21.7%	20070720	0.05%
VTV	Vanguard Value ETF	Equity	98,395	23.2%	20040126	0.04%
IEFA	iShares Core MSCI EAFE ETF	Equity	88,282	24.6%	20121018	0.07%
BND	Vanguard Total Bond Market ETF	Bond	84,735	25.9%	20070403	0.03%
AGG	iShares Core U.S. Aggregate Bond ETF	Bond	82,506	27.2%	20030922	0.03%

All ETPs 6,446,828

Observations (equity):

- 1) Only stock index products have \$AUM exceeding \$100 billion.
- 2) 8 largest are stock indexes and account for 24.6% of total \$AUM.
- 3) Top 3 have S&P 500 index benchmark and account for 13.9%.

30

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Observations (equity):

- 4) VTI is ETF on CRSP US Total Market Index (about 4,050 stocks).
- 5) VTV is ETF on CRSP US Large Cap Value Index (about 350 stocks).
- 6) QQQ is ETF on Nasdaq 100 – tech play.

31

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All ETPs 6,446,828

Observations (equity):

- 7) VEA and IEFA are non-US indexes. Both are based on developed markets.
 - VEA is ETF on FTSE Developed All Cap (about 4,000 stocks).
 - IEFA is ETF on MSCI EAFE IMI Index (about 3,050 stocks)

32

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All ETPs			6,446,828			

Observations (bond):

- 8) Final two are bond ETFs written on Bloomberg US Aggregate Bond Index.
- BND has 10,174 bonds (9/30/22).
 - AGG has 10,420 bonds (9/30/22).
 - Index has 12,641 bonds (both ETFs use index sampling).

33

Beyond stocks and bonds ...

\$AUM rank for largest ETP in each asset class				
Symbol	Name	Asset class	\$AUM	Rank
SPY	SPDR S&P 500 ETF Trust	Equity	353,479	1
BND	Vanguard Total Bond Market ETF	Bond	84,735	9
GLD	SPDR Gold Shares	Commodity	53,239	19
VNQ	Vanguard Real Estate ETF	Real Estate	32,765	37
PFF	iShares Preferred & Income Securities ETF	Preferred Stock	12,896	101
AOR	iShares Core Growth Allocation ETF	Multi-Asset	2,619	329
DBMF	iMGP DBI Managed Futures Strategy ETF	Alternatives	931	576
UVXY	ProShares Ultra VIX Short-Term Futures ETF	Volatility	655	694

Observations:

- 1) GLD ranks 19th largest (commodity).
- 2) VNQ ranks 37th largest (real estate).
 - MSCI US Investable Market Real Estate Index (about 165 US stocks).
 - Not asset class (thematic index based on industry group).
- 3) PFF ranks 101st largest (preferred stock).
 - ICE Exchange-listed Preferred & Hybrid Securities Index (500 stocks).
 - Hybrid of stocks and bonds (thematic index).

34

\$AUM (in millions) by asset class

\$AUM (in millions) by asset class			
Asset class	No. of ETPs	\$AUM	% of total
Equity	2,122	4,907,860	76.1%
Bond	512	1,261,303	19.6%
Commodity	105	131,546	2.0%
Real Estate	45	68,474	1.1%
Multi-Asset	143	34,742	0.5%
Preferred Stock	16	30,092	0.5%
Alternatives	35	5,796	0.1%
Currency	20	3,975	0.1%
Volatility	17	3,039	0.0%
Total	3,015	6,446,828	

Observations:

- 1) \$5.7T in stocks.
- 2) 95.7% in traditional asset classes (i.e., stocks and bonds).

35

Expense ratios

Expense ratios		
	EW	VW
n	3,015	
Mean	0.55%	0.17%
Minimum	0.00%	
Median	0.50%	
Maximum	10.92%	

Value-weighted expense ratios	
Bond	0.13%
Equity	0.17%
Real Estate	0.19%
Commodity	0.44%
Preferred Stock	0.53%
Multi-Asset	0.61%
Currency	0.69%
Alternatives	0.96%
Volatility	0.98%

Observations:

- 1) Average *ER* is 55 bps, and median is 50 bps.
- 2) Value-weighted *ER* is only 17 bps.
 - Investors buy low *ER* ETPs.
- 3) Value-weighted *ER* for bonds and stocks are lowest (13 and 17 bps).
- 4) Value-weighted *ER* for new asset classes are higher. Reasons include:
 - Total \$AUM are lower.
 - Assets are less liquid and have higher trading costs.
 - Strategies may involve active management.

36

Revenue estimates

ETP revenue estimates for 2022					
Asset class	No. of ETPs	\$AUM	VW ER	Revenue (in millions)	
				Total	Per fund
Equity	2,122	4,907,860	0.17%	8,373	3.95
Bond	512	1,261,303	0.13%	1,665	3.25
Commodity	105	131,546	0.44%	585	5.57
Real Estate	45	68,474	0.19%	132	2.93
Multi-Asset	143	34,742	0.61%	211	1.47
Preferred Stock	16	30,092	0.53%	161	10.04
Alternatives	35	5,796	0.96%	56	1.59
Currency	20	3,975	0.69%	28	1.38
Volatility	17	3,039	0.98%	30	1.76
Total	3,015	6,446,828		11,240	3.73

Observations:

- 1) Typical ETP earned revenue of \$3.73 million in 2022.
- 2) ETP industry as whole earned \$11.24 billion.

37

Top 10 ETPs by trading volume

Top 10 ETPs by dollar trading volume in millions						
Ticker symbol	Name	Asset class	\$AUM	\$TV	Turnover	Holding period
SPY	SPDR S&P 500 ETF Trust	Equity	353,479	33,824	9.57%	10.5
QQQ	Invesco QQQ Trust	Equity	143,493	15,346	10.69%	9.4
SQQQ	ProShares UltraPro Short QQQ	Equity	4,635	6,949	149.93%	0.7
IWM	iShares Russell 2000 ETF	Equity	51,127	4,597	8.99%	11.1
TQQQ	ProShares UltraPro QQQ	Equity	9,856	3,886	39.43%	2.5
HYG	iShares iBoxx \$ High Yield Corporate Bond ETF	Bond	16,357	2,748	16.80%	6.0
TLT	iShares 20+ Year Treasury Bond ETF	Bond	26,673	2,220	8.32%	12.0
XLE	Energy Select Sector SPDR Fund	Equity	40,196	2,094	5.21%	19.2
LQD	iShares iBoxx \$ Investment Grade Corporate Bond ETF	Bond	35,328	2,003	5.67%	17.6
IVV	iShares Core S&P 500 ETF	Equity	285,474	1,834	0.64%	155.6

$$\text{Turnover}_t \equiv \frac{\text{Average daily shares traded in past 3 months} \times \text{\$price per share}_t}{\text{\$AUM}_t}$$

$$\text{Holding period in days}_t \equiv \frac{1}{\text{Turnover}_t}$$

38

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Observations:

- 1) SPY is most actively traded ETP in US. On average, \$33.8 billion in shares trade each day.
 - On average, 9.6% of its outstanding shares turn over each day.
 - Equivalently, typical SPY share is held for 10.5 days.

39

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Observations:

- 2) SPY and IVV are ETFs benchmarked to S&P 500 index.
 - SPY used primarily as trading instrument (holding period is 10 days).
 - IVV used as buy-and-hold investment (holding period is 156 days).

40

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Observations:

- 3) SQQQ is -3x daily return on Nasdaq 100.
 - Is clearly used for day trading (turnover is 150%).

41

Market share by issuer

Issuer (Total no. of issuers = 213)	Market share by ETP issuer					
	No. of funds	\$AUM	Market share		\$AUM per share	
			%	Cumulative	Amount	Rank
BlackRock Financial Management	384	2,183,297.4	33.9%	33.9%	5,685.7	5
Vanguard	81	1,866,762.0	29.0%	62.8%	23,046.4	2
State Street	139	914,035.2	14.2%	77.0%	6,575.8	4
Invesco	237	324,691.6	5.0%	82.0%	1,370.0	8
Charles Schwab	28	256,842.9	4.0%	86.0%	9,173.0	3
First Trust	197	131,995.5	2.0%	88.1%	670.0	17
JPMorgan Chase	47	88,770.5	1.4%	89.4%	1,888.7	7
Dimensional	29	71,437.6	1.1%	90.6%	2,463.4	6
World Gold Council	2	58,370.6	0.9%	91.5%	29,185.3	1
ProShares	137	56,776.2	0.9%	92.3%	414.4	30

Observations:

- 3 issuers dominate market with 77.0% of \$AUM.
- World Gold Council has highest dollar \$AUM per fund.
- Vanguard is 2nd in \$AUM but 1st among top three in \$AUM per fund.

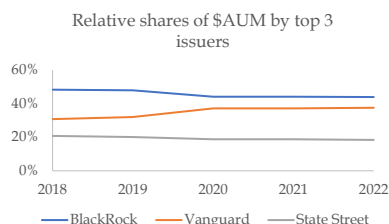
42

Market share by issuer

Market share of top 3 ETP issuers					
Issuer	2018	2019	2020	2021	2022
BlackRock	39.5%	39.1%	34.4%	34.4%	33.9%
Vanguard	25.1%	26.1%	29.0%	29.0%	29.0%
State Street	17.0%	16.3%	14.6%	14.6%	14.2%
	81.5%	81.5%	77.9%	77.9%	77.0%

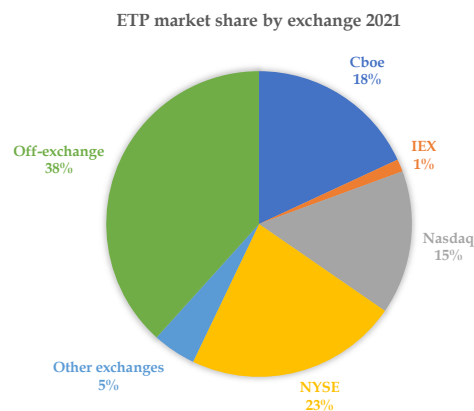
Observations:

- 1) Top 3 are losing ground relative to all other issuers.
- 2) Vanguard gained at expense of BlackRock/iShares and State Street during 2020.
 - Increase in cost-consciousness during public health emergency.



43

Market share by exchange



44

Key elements to ETP success

- Success of new ETPs is becoming increasingly difficult. Novel ideas are becoming fewer.
- Key elements in driving success:
 - Issuer reputation
 - Developed through creating clear and transparent products.
 - Exchange support
 - Have strong awareness of products and product markets.
 - Market maker (AP) support
 - Enters legal contract with an ETP distributor to create and redeem shares of the fund.
 - Provides efficiency in primary market.
 - Provides liquidity in secondary market.

45

Lesson summary

- ETPs intended to supplant index mutual funds.
 - Two key advantages are intraday trading and daily reporting of holdings (transparency).
- Two types of exchange-traded products (ETPs):
 - Exchange-traded funds (ETFs)
 - Are shares which represent ownership of underlying securities or derivatives.
 - Are fully transparent.
 - Exchange-traded notes (ETNs)
 - Are bonds subject to credit risk of issuer.
 - Are generally opaque.

46

Lesson summary

- Size and growth of ETP market is attributable to cost-efficient access to different market risks.
 - Price risks are asset classes (e.g., stocks, bond, commodities, volatility).
 - Trading (speculating)
 - Investing (diversifying or hedging)
 - Expense ratios (i.e., management fees) are small and getting smaller.
 - Costs of trading (e.g., commissions and bid/ask spreads) are small and getting smaller.

47

Lesson summary

- ETP data sources are current and comprehensive.
 - ETF.com
 - ETFdb.com (AIM ETF report generator 20231229.xlsx)
 - Morningstar
 - FactSet
 - Bloomberg
- 2024 Investment Company Fact Book provides comprehensive industry guide.

48