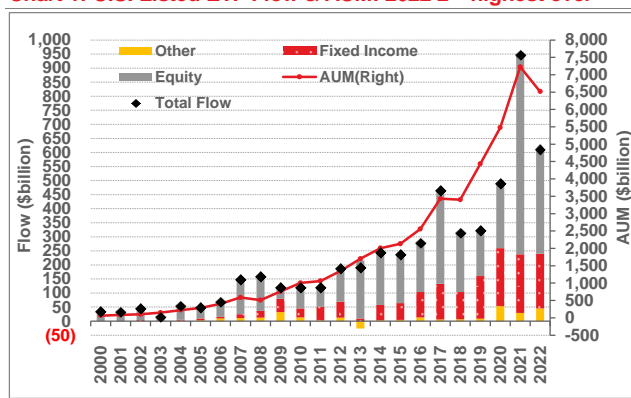


## December and Full-Year 2022: U.S. ETF Flow Flash Report

- Despite a tumultuous year in the markets, U.S. ETFs still received \$610 bln, the second highest inflow year ever
- Ultra-low-cost passive still dominates, but the active landscape is changing with record launches and conversions
- Investors switched to more defensive positions such as health care, dividend/income, and ultra-short-term bonds
- Alternative strategies such as managed futures delivered outstanding returns in 2022
- This “flash update” report presents charts and data, with further commentary to follow

### Summary

Chart 1: U.S. Listed ETF Flow & AUM: 2022 2<sup>nd</sup> highest ever



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

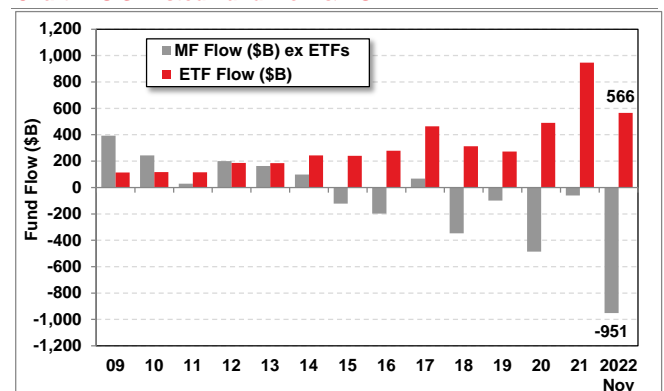
### ETF Flows Trumped Mutual Fund Flows:

Table 1: ETF Flows by Category

	AUM (\$B)	Mkt Shr	Dec 2022		Jan-Dec 2022	
			Flow (\$B)	Flow/AUM	Flow (\$B)	Flow/AUM
Equity	\$4,951		\$28.6	0.5%	\$370.4	6.5%
U.S. Broad/Large-Cap	\$1,522	23%	-\$2.0	-0.1%	\$83.4	4.6%
U.S. Other	\$2,292	35%	\$19.9	0.8%	\$181.7	7.2%
Int'l / Global	\$872	13%	\$7.0	0.8%	\$73.4	7.4%
Emerging Markets	\$266	4%	\$3.6	1.3%	\$31.9	10.5%
Fixed Income	\$1,294	20%	\$14.8	1.1%	\$194.7	15.3%
Commodity	\$131	2%	-\$1.6	-1.2%	-\$4.1	-3.0%
Multi-Asset	\$68	1%	\$2.1	3.1%	\$23.1	42.3%
Levered Long	\$44	1%	\$1.8	3.4%	\$20.7	27.2%
Inverse	\$24	0%	-\$0.7	-3.5%	\$5.3	45.4%
Crypto-Asset	\$1	0%	\$0.0	-2.6%	\$0.2	17.4%
<b>Total</b>	<b>\$6,513</b>	<b>100%</b>	<b>\$44.9</b>	<b>0.7%</b>	<b>\$610.4</b>	<b>8.4%</b>

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

Chart 2: U.S. Listed Fund Flow & AUM



Note: Mutual fund flow excludes money market fund flow

Source: NBF ETF Research, Bloomberg, ICI. Data as of November 2022.

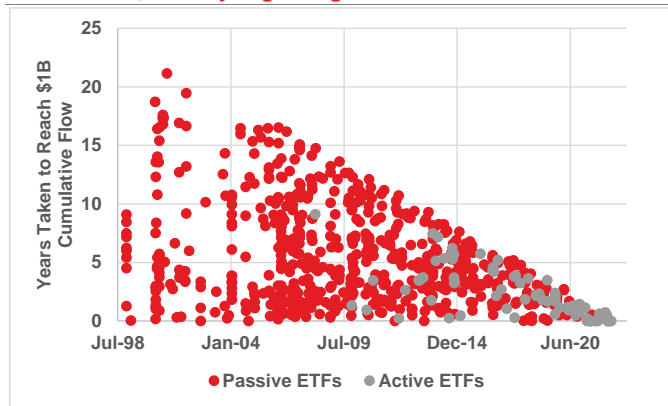
**Table 2: Mutual-Fund-to-ETF-Conversion Continued in 2022**

Providers	2021 Flow (\$M)	2021 AUM (\$M)	2022 Flow (\$M)	2022 AUM (\$M)
Dimensional Holdings	39,182	41,038	16,722	51,528
Motley Fool	927	948	(118)	573
Adaptive Investments	467	460	(56)	307
Guinness Atkinson	26	29	-	24
Alpha Architect	9	12	(0)	7
Foothill Capital	6	4	(3)	-
Water Island	4	3	(0)	3
JPMorgan			7,194	7,123
Kovitz			608	583
Neuberger Berman			211	219
Franklin Templeton			209	184
Bridgeway			173	138
Blue Sky			161	164
Fundx Investment			158	166
Habor			155	144
Conductor Fund			105	107
Soundwatch			95	96
Logan Capital			48	43
Innovative Portfolios			31	26
Convergence			25	24
<b>Total</b>	<b>40,620</b>	<b>42,494</b>	<b>25,716</b>	<b>61,461</b>
Contribution to Total Active ETF Flow/AUM	31.7%	14.3%	24.2%	17.5%

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

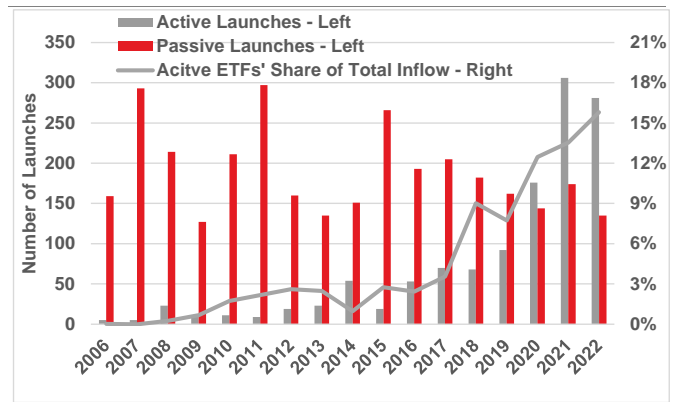
**Actively Managed ETFs and Record New Launches**

**Chart 3: Years Taken to Reach \$1 Billion Cumulative Flow – Active ETFs are late, but they’re growing fast**



Source: NBF ETF Research, Bloomberg. Data as of November 30, 2022.

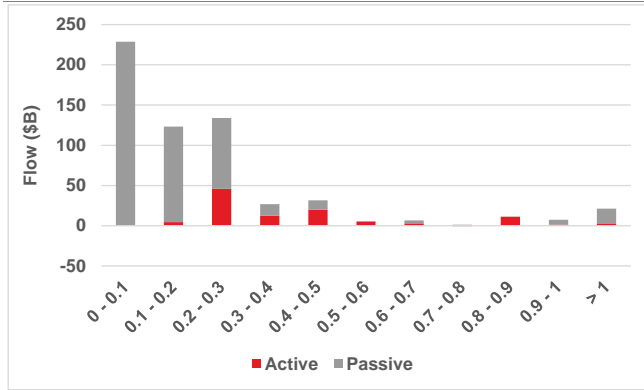
**Chart 4: Active ETF Launches now Outnumber Passive Ones**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Flow by MER**

**Chart 5: U.S. Listed ETFs Flow by MER Bucket**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Equity Flows by Region**

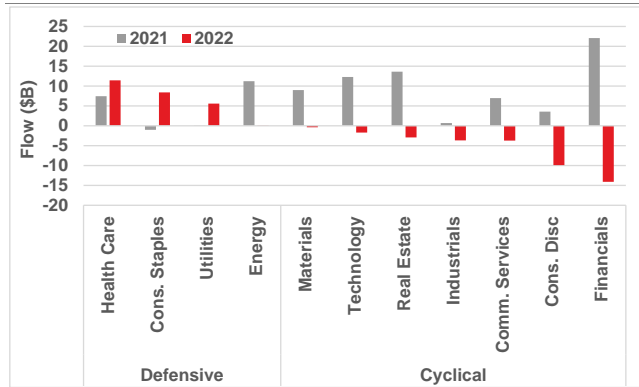
**Table 3: Equity ETF Flows by Geography**

Geography	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>U.S.</b>	<b>\$3,814</b>		<b>\$265.1</b>	<b>6.1%</b>
Broad/Large Cap	\$1,522	31%	\$83.4	4.6%
U.S. Other	\$2,292	46%	\$181.7	7.2%
<b>International Developed</b>	<b>\$529</b>		<b>\$41.6</b>	<b>7.0%</b>
Broad Int'l Dev	\$415	8%	\$45.4	10.2%
Broad Europe	\$36	1%	-\$10.5	-18.4%
Japan	\$20	0%	-\$0.3	-1.4%
Canada	\$10	0%	\$1.1	11.3%
Other Developed	\$49	1%	\$5.8	10.8%
<b>Emerging Markets</b>	<b>\$266</b>		<b>\$31.9</b>	<b>10.5%</b>
Broad Cap Weighted	\$176	4%	\$16.4	8.0%
China (A+H)	\$26	1%	\$7.0	25.4%
Other EM	\$63	1%	\$8.5	12.0%
<b>Global/Regional</b>	<b>\$343</b>	<b>7%</b>	<b>\$31.8</b>	<b>7.8%</b>
<b>Total Displayed</b>	<b>\$4,951</b>	<b>100%</b>	<b>\$370.4</b>	<b>6.5%</b>

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Equity Flows by Sector**

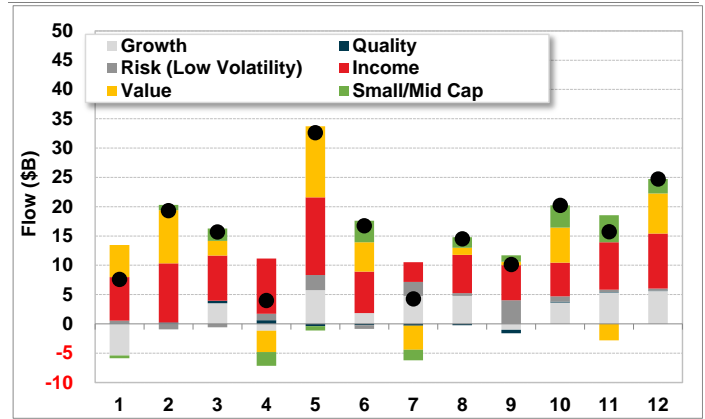
**Chart 6: Rotation from Cyclical to Defensive Sectors**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Equity Flows by Factor**

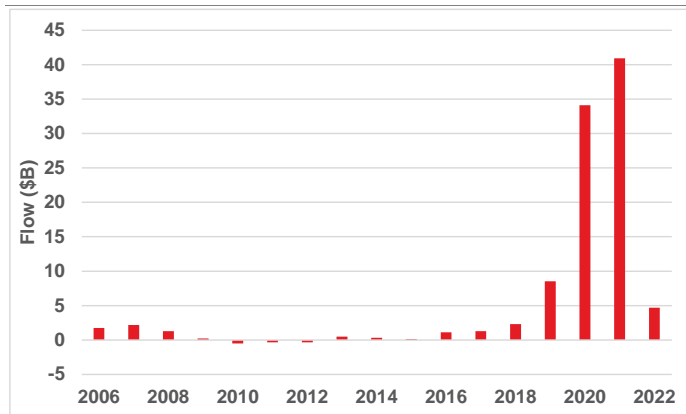
**Chart 7: Dividend/Income and Value Received Great Traction**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**ESG Flows**

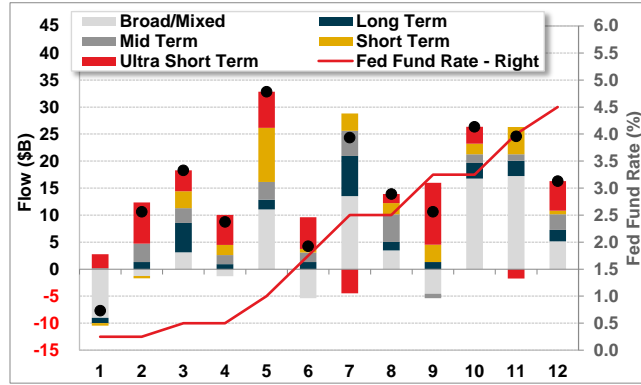
**Chart 8: U.S. Listed ESG ETF Flow Declined by 90% From 2021's Record Amount**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

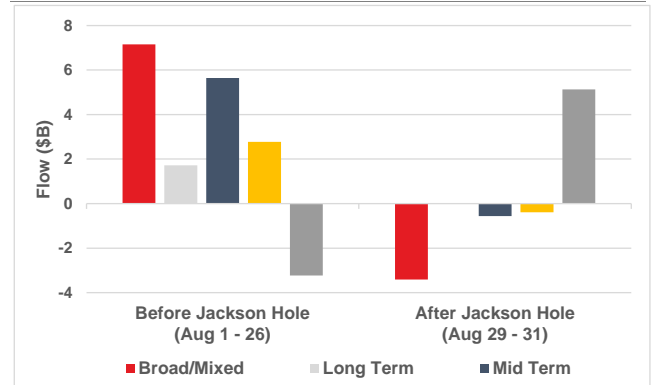
**Fixed Income ETFs**

**Chart 9: Investors sought low duration exposure as rate hikes began, but some used long duration products to anticipate dovish signals from the Fed**



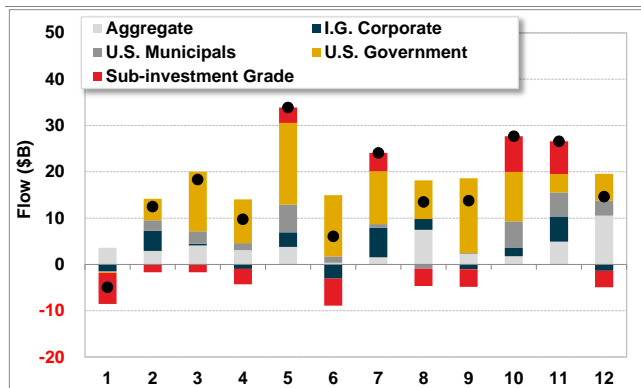
Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Chart 10: Investor sentiment shifted after Powell's speech on August 26th; Ultra-short-term products back in favour**



Source: NBF ETF Research, Bloomberg. Data as of August 31, 2022.

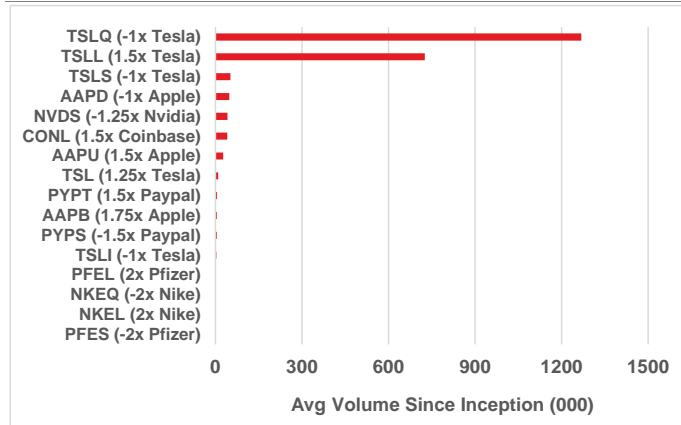
**Chart 11: Fixed Income ETF Flow by Category: U.S. Government Bond ETFs led in net creations**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

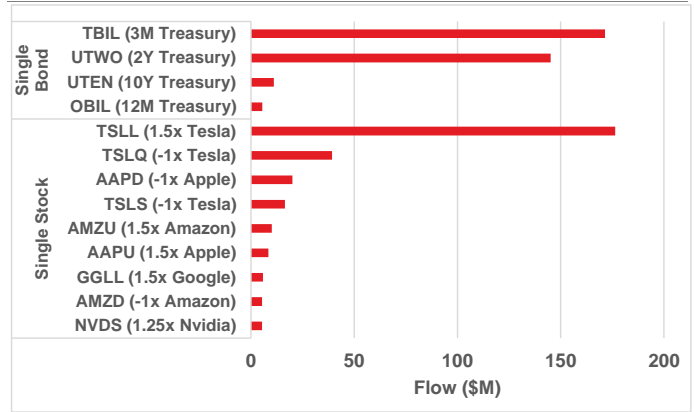
**Single Security ETFs**

**Chart 12: Leveraged/Inverse Tesla ETFs had most of the trading volume among the new “single stock” ETFs**



Source: NBF ETF Research, Bloomberg. Data as of November 30, 2022.

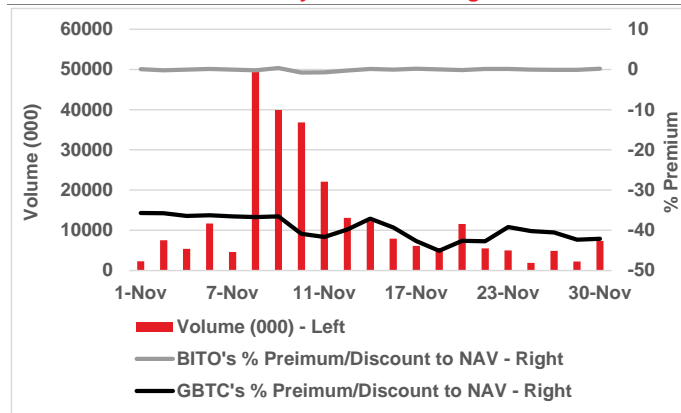
**Chart 13: Single Bond ETFs and Tesla ETFs attracted most of the assets into Single Security ETFs**



Source: NBF ETF Research, Bloomberg. Data as of November 30, 2022.

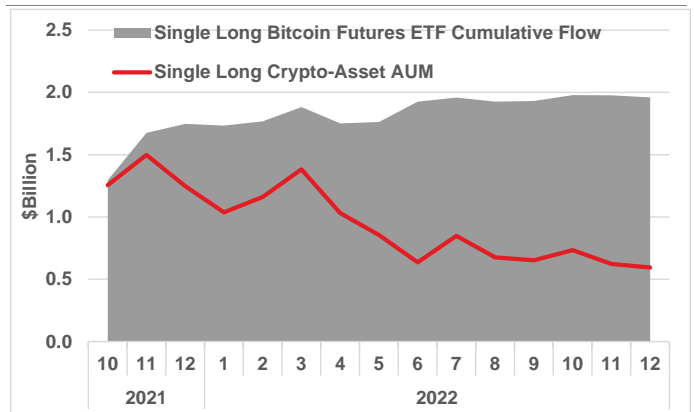
**Crypto-asset ETFs and Blockchain-themed ETFs**

**Chart 14: BITO Traded Closely to NAV amid High Volume**

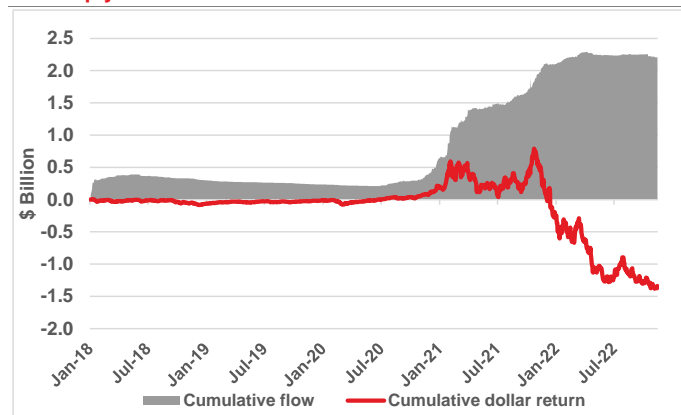


Source: NBF ETF Research, Bloomberg. Data as of November 30, 2022.

**Chart 15: No significant outflow from Bitcoin Futures ETFs despite the huge decline in Bitcoin’s price— “bag holding” or “diamond hands?”**



**Chart 16: Blockchain-themed ETFs: Performance-chasing investors are deeply underwater**

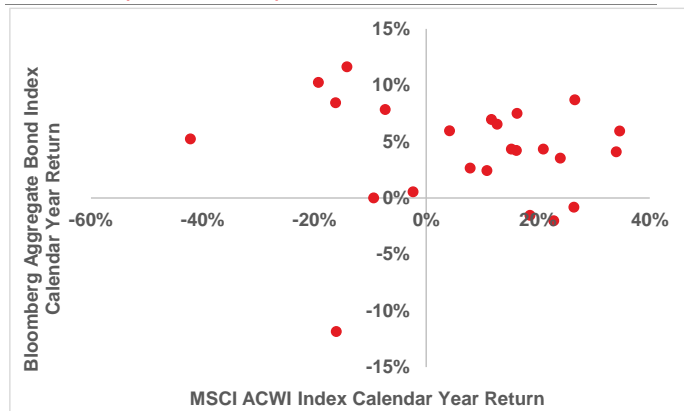


Source: NBF ETF Research, Bloomberg. Data as of November 30, 2022.

**ETF Strategies - What have/have not worked in 2022.**

**Balanced portfolio:**

**Chart 17: 2022 - A rare period when both Equities and Bonds were down (and down a lot)**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Top-performing ETFs:**

**Table 4: Best Performing ETFs\* - Full-Year 2022**

Ticker	Name	2022 Flow (\$M)	Flow/AUM (%)	2022 Total Return (%)
TUR	iShares MSCI Turkey ETF	-83	-30	105.8
PFI	Simplify Interest Rate Hedge ETF	123	106	92.0
OIH	VanEck Oil Services ETF	-680	-32	66.2
IEZ	iShares U.S. Oil Equipment & Services ETF	200	199	65.7
XLE	Energy Select Sector SPDR Fund	-1008	-4	64.2
FENY	Fidelity MSCI Energy Index ETF	46	5	63.1
VDE	Vanguard Energy ETF	-671	-11	62.9
PXJ	Invesco Dynamic Oil & Gas Services ETF	44	207	62.1
XES	SPDR S&P Oil & Gas Equipment & Services	99	80	62.0
IYE	iShares U.S. Energy ETF	-1395	-56	60.3

\* excluding leveraged / inverse ETFs. Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

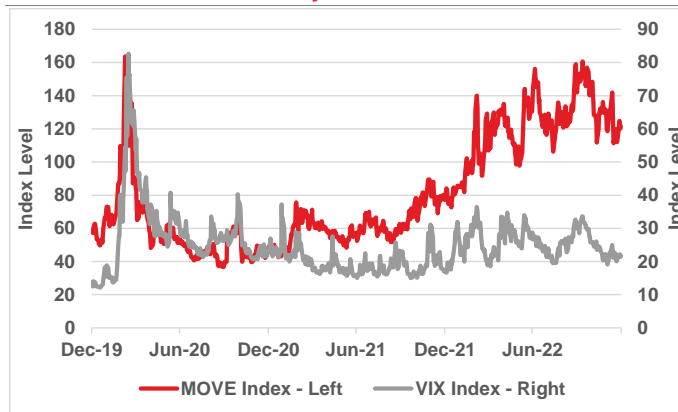
**Option strategies:**

**Table 5: Performance and Flow of Long Put Equity Option ETFs vs Long Put Bond Option ETFs**

Ticker	Name	2022 Flow (\$M)	Flow/AUM (%)	2022 Total Return (%)
SPY	SPDR S&P 500 ETF Trust			-18.2
TAIL	Cambria Tail Risk ETF	-23	-7	-13.1
HEGD	Swan Hedged Equity US Large Cap ETF	-11	-7	-11.3
XTR	Global X S&P 500 Tail Risk ETF	0	0	-17.7
AGG	iShares Core U.S. Aggregate Bond ETF			-13.0
PFI	Simplify Interest Rate Hedge ETF	123	106	92.0
RRH	Advocate Rising Rate Hedge ETF	16	90	37.8

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**Chart 18: Bond Market Volatility Rose to 2020 March Level**



Source: NBF ETF Research, Refinitiv. Data as of December 31, 2022.

**Alternative ETFs:**

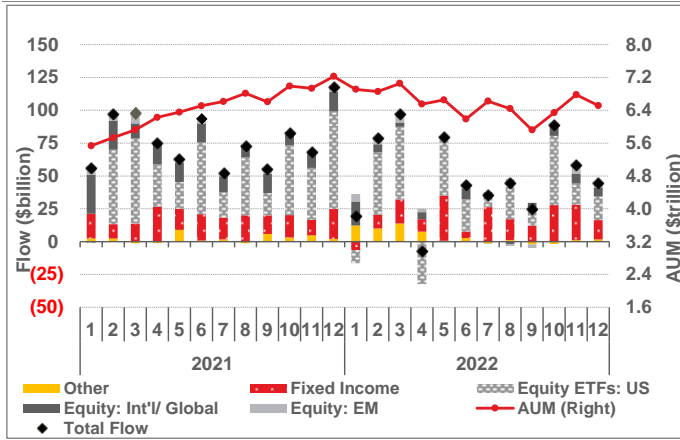
**Table 6: Managed Futures ETFs welcomed a significant amount of inflow in 2022**

Focus	2022 Flow (\$M)	AUM (\$M)	2022 Total Return (%)	Number of ETFs
Managed Futures	1783	1,929	12.7	6
Market Neutral	247	399	13.9	2
Equity Focused	205	1,514	-6.3	13
Other	96	1,374	-10.6	8
Fixed Income	59	95	24.7	4
Multi-Alternative	27	1,186	-7.9	12

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**December 2022 ETF Flows:**

**Chart 19: U.S. Listed ETF Flow and AUM**



Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022.

**December 2022 ETF Flows: Table 7 - 13 (Continued Next Page)**

**Table 7 - Equity ETF Flows by Geography - Dec 2022**

Geography	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>U.S.</b>	<b>\$3,814</b>		<b>\$17.9</b>	<b>0.4%</b>
Broad/Large Cap	\$1,522	31%	-\$2.0	-0.1%
U.S. Other	\$2,292	46%	\$19.9	0.8%
<b>International Developed</b>	<b>\$529</b>		<b>\$3.4</b>	<b>0.6%</b>
Broad Int'l Dev	\$415	8%	\$3.4	0.8%
Broad Europe	\$36	1%	-\$0.1	-0.4%
Japan	\$20	0%	\$0.1	0.7%
Canada	\$10	0%	-\$0.2	-2.4%
Other Developed	\$49	1%	\$0.3	0.5%
<b>Emerging Markets</b>	<b>\$266</b>		<b>\$3.6</b>	<b>1.3%</b>
Broad Cap Weighted	\$176	4%	\$2.0	1.1%
China (A+H)	\$26	1%	\$0.6	2.4%
Other EM	\$63	1%	\$1.0	1.6%
<b>Global/Regional</b>	<b>\$343</b>	<b>7%</b>	<b>\$3.6</b>	<b>1.0%</b>
<b>Total Displayed</b>	<b>\$4,951</b>	<b>100%</b>	<b>\$28.6</b>	<b>0.5%</b>

Source: National Bank of Canada, Bloomberg

**Table 8 - Equity ETF Flows by Sector and Themes\* - Dec 2022**

Sector	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
Real Estate	\$70	9%	\$0.7	0.9%
Consumer Staples	\$31	4%	\$0.5	1.4%
Industrials	\$33	4%	\$0.4	1.1%
Communication Services	\$24	3%	-\$0.3	-1.0%
Materials	\$41	5%	-\$0.3	-0.6%
Energy	\$86	11%	-\$0.4	-0.4%
Utilities	\$26	3%	-\$0.5	-1.9%
Consumer Discretionary	\$23	3%	-\$0.5	-2.0%
Health Care	\$105	14%	-\$0.7	-0.6%
Technology	\$136	18%	-\$1.2	-0.8%
Financials	\$58	8%	-\$1.6	-2.6%
ESG	\$84	11%	-\$0.3	-0.4%
Thematic	\$55	7%	\$0.1	0.1%
<b>Total Displayed</b>	<b>\$773</b>	<b>100%</b>	<b>-\$4.2</b>	<b>-0.5%</b>

\*Includes all geographic focus; Source: National Bank of Canada, Bloomberg  
QQQ is classified as a broad market ETF and does not belong to technology sector

**Table 12 - Top Single Long ETF Inflows - Dec 2022**

Ticker	Name	Flow (\$B)	Flow/AUM
1	AGG iShares Core U.S. Aggregate Bond ETF	\$2.8	3.4%
2	VTI Vanguard Total Stock Market ETF	\$2.5	0.9%
3	BND Vanguard Total Bond Market ETF	\$2.3	2.7%
4	IWF iShares Russell 1000 Growth ETF	\$1.8	2.8%
5	SGOV iShares 0-3 Month Treasury Bond ETF	\$1.6	28.4%
6	SCHD Schwab US Dividend Equity ETF	\$1.6	3.6%
7	JPST JPMorgan Ultra-Short Income ETF	\$1.6	7.0%
8	VTV Vanguard Value ETF	\$1.5	1.5%
9	JEPI JPMorgan Equity Premium Income ETF	\$1.4	8.7%
10	IEF iShares 7-10 Year Treasury Bond ETF	\$1.2	5.6%
11	VEA Vanguard FTSE Developed Markets ETF	\$1.1	1.1%
12	SUB iShares Short-Term National Muni Bond ETF	\$1.1	10.6%
13	SPYV SPDR Portfolio S&P 500 Value ETF	\$1.0	6.9%
14	IWD iShares Russell 1000 Value ETF	\$1.0	1.8%
15	VOO Vanguard S&P 500 ETF	\$0.9	0.3%
16	GBIL Goldman Sachs Access Treasury 0-1 Year ETF	\$0.9	21.9%
17	VIG Vanguard Dividend Appreciation ETF	\$0.9	1.3%
18	HDV iShares Core High Dividend ETF	\$0.8	6.5%
19	VGSH Vanguard Short-Term Treasury ETF	\$0.8	4.6%
20	VTEB Vanguard Tax-Exempt Bond Index ETF	\$0.8	3.4%

Source: National Bank of Canada, Bloomberg

**Table 9 - Fixed Income ETF Flows by Type - Dec 2022**

Type	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
U.S. Aggregate	\$295	23%	\$8.9	3.1%
U.S. Government	\$397	31%	\$5.8	1.5%
U.S. Municipals	\$100	8%	\$3.3	3.4%
U.S. I.G. Corporate	\$212	16%	-\$1.4	-0.7%
Developed Markets&Global	\$137	11%	\$1.8	1.3%
Emerging Markets	\$27	2%	\$0.6	2.2%
Sub-investment Grade	\$87	7%	-\$3.6	-3.9%
Convertibles and Preferreds	\$39	3%	-\$0.6	-1.4%
<b>Total Displayed</b>	<b>\$1,294</b>	<b>100%</b>	<b>\$14.8</b>	<b>1.1%</b>

Source: National Bank of Canada, Bloomberg

**Table 10 - Fixed Income ETF Flows by Maturity - Dec 2022**

Maturity	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
Broad/Mixed	\$632	49%	\$5.1	0.8%
Ultra Short Term	\$167	13%	\$5.5	3.4%
Short Term	\$261	20%	\$0.6	0.2%
Mid Term	\$143	11%	\$2.9	2.1%
Long Term	\$58	4%	\$2.1	3.7%
Target Maturity	\$32	2%	-\$1.4	-4.2%
Rate Hedged	\$2	0%	-\$0.1	-5.9%
<b>Total Displayed</b>	<b>\$1,294</b>	<b>100%</b>	<b>\$14.8</b>	<b>1.1%</b>

Source: National Bank of Canada, Bloomberg

**Table 11 - Equity ETF Flows by Factor\* - Dec 2022**

Factor	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
Income	\$386	22%	\$9.4	2.4%
Value	\$404	23%	\$6.9	1.6%
Growth	\$311	17%	\$5.6	1.7%
Small/Mid Cap	\$414	23%	\$2.4	0.6%
Low Vol	\$68	4%	\$0.4	0.5%
Momentum	\$24	1%	\$0.1	0.4%
Quality	\$36	2%	\$0.1	0.3%
Multi-Factor and Other	\$136	8%	\$0.3	0.2%
<b>Total Displayed</b>	<b>\$1,780</b>	<b>100%</b>	<b>\$25.1</b>	<b>1.4%</b>

\*Includes all geographic focus, excluding sector ETFs; Source: NBC, Bloomberg

**Table 13 - Top Single Long ETF Outflows - Dec 2022**

Ticker	Name	Flow (\$B)	Flow/AUM
1	IVV iShares Core S&P 500 ETF	-\$3.5	-1.1%
2	HYG iShares iBoxx High Yield Corporate Bond ETF	-\$2.1	-11.5%
3	QQQ Invesco QQQ Trust Series 1	-\$2.0	-1.2%
4	SPY SPDR S&P 500 ETF Trust	-\$1.8	-0.5%
5	BSCM Invesco BulletShares 2022 Corporate Bond ETF	-\$1.5	-99.7%
6	TIP iShares TIPS Bond ETF	-\$1.5	-6.1%
7	IBDN iShares iBonds Dec 2022 Term Corporate ETF	-\$1.3	-99.9%
8	LQD iShares iBoxx \$ Investment Grade Corporate Bond	-\$1.1	-3.1%
9	SHY iShares 1-3 Year Treasury Bond ETF	-\$1.0	-3.6%
10	VTIP Vanguard Short-Term Inflation-Protected	-\$0.9	-4.9%
11	MINT PIMCO Enhanced Short Maturity Active ETF	-\$0.8	-8.5%
12	VCSH Vanguard Short-Term Corporate Bond ETF	-\$0.8	-1.9%
13	XLU Utilities Select Sector SPDR Fund	-\$0.6	-3.4%
14	SMH VanEck Semiconductor ETF	-\$0.6	-7.4%
15	HYDW Xtrackers Low Beta High Yield Bond ETF	-\$0.5	-41.4%
16	BSJM Invesco BulletShares 2022 HY Corp Bond ETF	-\$0.5	-99.8%
17	XLF Financial Select Sector SPDR Fund	-\$0.5	-1.3%
18	JIRE JPMorgan Int'l Research Enhanced Equity ETF	-\$0.4	-7.9%
19	VNQ Vanguard Real Estate ETF	-\$0.4	-1.2%
20	MDYG SPDR S&P 400 Mid CapGrowth ETF	-\$0.4	-19.1%

Source: National Bank of Canada, Bloomberg



**Appendix 1: 2022 January - December ETF Flow Tables**

Geography	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>U.S.</b>	<b>\$3,814</b>		<b>\$265.1</b>	<b>6.1%</b>
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Broad Europe	\$36	1%	-\$10.5	-18.4%
Japan	\$20	0%	-\$0.3	-1.4%
Canada	\$10	0%	\$1.1	11.3%
Other Developed	\$49	1%	\$5.8	10.8%
<b>Emerging Markets</b>	<b>\$266</b>		<b>\$31.9</b>	<b>10.5%</b>
Broad Cap Weighted	\$176	4%	\$16.4	8.0%
China (A+H)	\$26	1%	\$7.0	25.4%
Other EM	\$63	1%	\$8.5	12.0%
<b>Global/Regional</b>	<b>\$343</b>	<b>7%</b>	<b>\$31.8</b>	<b>7.8%</b>
<b>Total Displayed</b>	<b>\$4,951</b>	<b>100%</b>	<b>\$370.4</b>	<b>6.5%</b>

Source: National Bank of Canada, Bloomberg

Sector	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>Health Care</b>	<b>\$105</b>	<b>14%</b>	<b>\$11.5</b>	<b>10.8%</b>
Consumer Staples	\$31	4%	\$8.5	35.6%
Utilities	\$26	3%	\$5.4	25.3%
Energy	\$86	11%	\$0.4	0.7%
Materials	\$41	5%	-\$0.8	-1.5%
Technology	\$136	18%	-\$1.6	-0.8%
Real Estate	\$70	9%	-\$3.0	-3.0%
Industrials	\$33	4%	-\$3.7	-9.2%
Communication Services	\$24	3%	-\$3.9	-9.1%
Consumer Discretionary	\$23	3%	-\$9.9	-20.1%
Financials	\$58	8%	-\$13.8	-16.3%
<b>ESG</b>	<b>\$84</b>	<b>11%</b>	<b>\$3.5</b>	<b>3.5%</b>
Thematic	\$55	7%	\$3.3	4.4%
<b>Total Displayed</b>	<b>\$773</b>	<b>100%</b>	<b>-\$4.0</b>	<b>-0.4%</b>

\*Includes all geographic focus; Source: National Bank of Canada, Bloomberg  
QQQ is classified as a broad market ETF and does not belong to technology sector

Type	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>U.S. Aggregate</b>	<b>\$295</b>	<b>23%</b>	<b>\$30.7</b>	<b>10.1%</b>
U.S. Government	\$397	31%	\$116.8	35.6%
U.S. Municipals	\$100	8%	\$28.2	35.8%
U.S. I.G. Corporate	\$212	16%	\$16.0	7.0%
Developed Markets&Global	\$137	11%	\$16.4	12.1%
Emerging Markets	\$27	2%	-\$0.3	-0.8%
Sub-investment Grade	\$87	7%	-\$7.9	-7.3%
Convertibles and Preferreds	\$39	3%	-\$5.2	-9.2%
<b>Total Displayed</b>	<b>\$1,294</b>	<b>100%</b>	<b>\$194.7</b>	<b>15.3%</b>

Source: National Bank of Canada, Bloomberg

Maturity	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>Broad/Mixed</b>	<b>\$632</b>	<b>49%</b>	<b>\$45.6</b>	<b>6.5%</b>
Ultra Short Term	\$167	13%	\$51.2	43.3%
Short Term	\$261	20%	\$31.5	12.8%
Mid Term	\$143	11%	\$28.8	21.2%
Long Term	\$58	4%	\$28.4	58.6%
Target Maturity	\$32	2%	\$11.0	48.4%
Rate Hedged	\$2	0%	-\$1.7	-46.7%
<b>Total Displayed</b>	<b>\$1,294</b>	<b>100%</b>	<b>\$194.7</b>	<b>15.3%</b>

Source: National Bank of Canada, Bloomberg

Factor	AUM (\$B)	Mkt Shr	Flow (\$B)	Flow/AUM
<b>Income</b>	<b>\$386</b>	<b>22%</b>	<b>\$95.4</b>	<b>29.9%</b>
Value	\$404	23%	\$39.2	9.8%
Growth	\$311	17%	\$28.2	7.0%
Small/Mid Cap	\$414	23%	\$15.6	3.2%
Low Vol	\$68	4%	\$10.5	16.0%
Momentum	\$24	1%	\$0.6	2.0%
Quality	\$36	2%	\$0.0	-0.1%
Multi-Factor and Other	\$136	8%	\$14.5	10.1%
<b>Total Displayed</b>	<b>\$1,780</b>	<b>100%</b>	<b>\$204.0</b>	<b>10.8%</b>

\*Includes all geographic focus, excluding sector ETFs; Source: NBC, Bloomberg

Ticker	Name	Flow (\$B)	Flow/AUM
1 <b>VOO</b>	Vanguard S&P 500 ETF	\$39.8	14.2%
2 <b>VTI</b>	Vanguard Total Stock Market ETF	\$26.2	8.8%
3 <b>IVV</b>	iShares Core S&P 500 ETF	\$18.8	5.6%
4 <b>TLT</b>	iShares 20+ Year Treasury Bond ETF	\$15.7	79.6%
5 <b>SCHD</b>	Schwab US Dividend Equity ETF	\$15.6	49.7%
6 <b>BND</b>	Vanguard Total Bond Market ETF	\$14.3	17.0%
7 <b>BIL</b>	SPDR Bloomberg Barclays 1-3 Month T-Bill ETF	\$13.1	96.5%
8 <b>JEPI</b>	JPMorgan Equity Premium Income ETF	\$12.9	219.9%
9 <b>USFR</b>	WisdomTree Floating Rate Treasury Fund	\$11.3	610.9%
10 <b>VTV</b>	Vanguard Value ETF	\$11.1	12.0%
11 <b>VTEB</b>	Vanguard Tax-Exempt Bond Index ETF	\$10.9	73.0%
12 <b>VEA</b>	Vanguard FTSE Developed Markets ETF	\$10.4	9.4%
13 <b>VUG</b>	Vanguard Growth ETF	\$9.3	10.3%
14 <b>COWZ</b>	Pacer US Cash Cows 100 ETF	\$9.3	734.0%
15 <b>MUB</b>	iShares National Muni Bond ETF	\$9.0	35.8%
16 <b>VYM</b>	Vanguard High Dividend Yield ETF	\$8.9	20.8%
17 <b>IEF</b>	iShares 7-10 Year Treasury Bond ETF	\$8.8	50.1%
18 <b>GOVT</b>	iShares US Treasury Bond ETF	\$8.8	54.2%
19 <b>SHY</b>	iShares 1-3 Year Treasury Bond ETF	\$8.1	39.5%
20 <b>DFUV</b>	Dimensional US Marketwide Value ETF	\$8.1	NA

Source: National Bank of Canada, Bloomberg

Ticker	Name	Flow (\$B)	Flow/AUM
1 <b>SPY</b>	SPDR S&P 500 ETF Trust	-\$22.2	-4.8%
2 <b>TIP</b>	iShares TIPS Bond ETF	-\$9.9	-25.4%
3 <b>XLF</b>	Financial Select Sector SPDR Fund	-\$6.7	-15.2%
4 <b>VLUE</b>	iShares MSCI USA Value Factor ETF	-\$6.4	-39.6%
5 <b>BBEU</b>	JPMorgan BetaBuilders Europe ETF	-\$5.0	-51.1%
6 <b>MINT</b>	PIMCO Enhanced Short Maturity Active ETF	-\$4.5	-33.1%
7 <b>SCHP</b>	Schwab US TIPS ETF	-\$4.2	-19.6%
8 <b>PFF</b>	iShares Preferred & Income Securities ETF	-\$3.4	-16.4%
9 <b>HYG</b>	iShares iBoxx High Yield Corporate Bond ETF	-\$3.3	-15.1%
10 <b>VGK</b>	Vanguard FTSE Europe ETF	-\$3.0	-13.5%
11 <b>IWM</b>	iShares Russell 2000 ETF	-\$2.8	-4.0%
12 <b>FALN</b>	iShares Fallen Angels USD Bond ETF	-\$2.7	-54.2%
13 <b>XLY</b>	Consumer Discretionary Select Sector SPDR	-\$2.6	-11.2%
14 <b>FDN</b>	First Trust Dow Jones Internet Index Fund	-\$2.6	-26.5%
15 <b>XLI</b>	Industrial Select Sector SPDR Fund	-\$2.6	-14.6%
16 <b>BSCM</b>	Invesco BulletShares 2022 Corporate Bond ETF	-\$2.4	-99.2%
17 <b>QUAL</b>	iShares MSCI USA Quality Factor ETF	-\$2.4	-9.4%
18 <b>GLD</b>	SPDR Gold Shares	-\$2.4	-4.1%
19 <b>VNQ</b>	Vanguard Real Estate ETF	-\$2.2	-4.3%
20 <b>IXG</b>	iShares Global Financials ETF	-\$2.1	-74.4%

Source: National Bank of Canada, Bloomberg

**Table 21: ETF Provider Table**

Provider	AUM (\$B)	Mkt Shr	Dec 2022		Jan-Dec 2022	
			Flow (\$B)	Flow/AUM	Flow (\$B)	Flow/AUM
1 BlackRock iShares	\$2,204	34%	\$16.3	0.7%	\$166.1	6.7%
2 Vanguard	\$1,887	29%	\$16.5	0.8%	\$192.8	9.3%
3 State Street SSGA	\$979	15%	-\$0.8	-0.1%	\$25.2	2.3%
4 Invesco	\$328	5%	-\$3.9	-1.1%	\$19.7	4.8%
5 Charles Schwab	\$260	4%	\$3.6	1.3%	\$35.5	13.1%
6 First Trust	\$133	2%	\$0.2	0.1%	\$9.2	6.1%
7 JPMorgan	\$90	1%	\$2.5	2.8%	\$26.0	36.0%
8 Dimensional Holdings	\$72	1%	\$4.1	5.7%	\$34.3	75.8%
9 ProShares	\$57	1%	\$0.9	1.5%	\$14.7	20.5%
10 WisdomTree	\$56	1%	\$1.0	1.8%	\$14.6	30.2%
11 VanEck	\$51	1%	-\$0.4	-0.8%	\$1.6	2.6%
12 Global X	\$36	1%	\$0.0	-0.1%	\$3.8	9%
13 Fidelity	\$30	0%	\$0.2	0.6%	\$2.8	8%
14 Goldman Sachs	\$27	0%	\$0.7	2.7%	\$4.6	16.9%
15 Direxion	\$23	0%	-\$0.1	-0.2%	\$11.1	37.1%
16 PIMCO	\$21	0%	-\$0.7	-3.2%	-\$3.6	-13.5%
17 Northern Trust	\$21	0%	-\$0.1	-0.3%	\$2.2	10.8%
18 Pacer Financial	\$19	0%	\$0.9	4.6%	\$11.3	111.5%
19 American Century	\$19	0%	\$1.3	7.1%	\$10.8	108.8%
20 DWS Xtrackers	\$18	0%	-\$0.5	-2.5%	-\$1.6	-6.8%
<b>Top 20 Total</b>	<b>\$6,333</b>	<b>97%</b>	<b>\$41.8</b>		<b>\$580.9</b>	
<b>Total ETF</b>	<b>\$6,513</b>	<b>100%</b>	<b>\$44.9</b>		<b>\$610.4</b>	

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022

**Table 22: ESG ETF Flows by Categories**

Category	AUM (\$M)	AUM (%)	December 2022		Jan - Dec 2022	
			Flow (\$M)	Flow/AUM	Flow (\$M)	Flow/AUM
Equity	\$84,920	91%	-\$305	-0.3%	\$3,860	3.7%
Broad - U.S.	\$45,981	50%	\$2	0.0%	\$994	1.7%
Broad - DM	\$7,888	8%	-\$25	-0.3%	\$855	10.0%
Broad - EM	\$4,167	4%	-\$52	-1.2%	-\$702	-10.7%
Broad - Global	\$3,729	4%	\$25	0.6%	\$592	14.7%
Environment	\$7,585	8%	\$91	1.1%	\$1,799	23.3%
Clean Energy	\$12,259	13%	-\$247	-1.8%	-\$731	-4.6%
Social	\$2,352	3%	-\$113	-4.3%	\$533	23.3%
Other	\$663	1%	\$8	1.1%	\$297	61.8%
Commodities	\$967	1%	-\$45	-4.0%	-\$534	-28.5%
Multi-Asset	\$160	0%	\$0	0.0%	-\$1	-0.5%
Fixed Income	\$6,788	7%	\$118	1.8%	\$1,696	27.8%
<b>Total Displayed</b>	<b>\$92,836</b>	<b>100%</b>	<b>-\$232</b>	<b>-0.2%</b>	<b>\$5,020</b>	<b>4.5%</b>

Source: NBF ETF Research, Bloomberg. Data as of December 31, 2022

## Appendix 2 - Glossary

Exchange Traded Funds (ETFs) are open-ended mutual funds in continuous distribution. This report also includes other Exchange Traded Products such as notes, grantor trusts, limited partnerships and unit investment trusts.

**AUM (Assets Under Management):** AUM is expressed in local currency, which is the U.S. dollar for the purpose of this report.

**Market Share / AUM (%):** AUM as % of category total AUM on the last line of the table.

**Flow:** The net dollar amount of fund creations and redemptions for the period based on daily NAV and the change in Shares Outstanding. Flows are expressed in local currency, which is the U.S. dollar for the purpose of this report.

**Maturity:** We categorize fixed income ETFs into the following maturity brackets:

- **Broad/Mixed:** ETF that holds issues from across more than one maturity bucket (short, mid and/or long term).
- **Floating Rate:** ETF that mainly invests in floating rate issues with periodic interest rate resets.
- **Long-Term:** ETF that mainly invests in long-term issues and has a weighted average maturity greater than 10 years.
- **Mid-Term:** ETF that mainly invests in intermediate-term fixed issues and has a weighted average maturity between three and 10 years.
- **Short-Term:** ETF that mainly invests in short-term issues with weighted average maturity less than three years.
- **Target Maturity:** ETF that has a target maturity, such as a fixed date or year.
- **Rate Hedged:** ETF that uses derivatives to mitigate interest rate risk and to maintain a zero or negative portfolio duration.

**NAV (Net Asset Value per share):** ETF price is used when NAV is not available.

**Flow/AUM (Flow as % AUM):** Flow as a percentage of assets under management from the beginning of the period.

**Defensive Sectors:** We classify Consumer non-cyclicals, Energy, Healthcare, Utilities as defensive sectors.

**Cyclical Sectors:** We classify Consumer Cyclicals, Financials, Real Estate, Industrials, Information Technology, Materials, Communication Services as cyclical sectors.

*All numbers are as of last month's final business day.*

## Appendix 3 - Equity ETF by Factor Categories

We group Factor Equity ETFs (exclude cap-weighted ETFs, sector ETFs and thematic ETFs) into the categories below. These groupings follow NBF's discretion and can differ from the ETF Provider's definition and classification from other sources.

**Small/Mid Cap:** A fund with small/mid cap focus.

**Income:** A fund with the primary goal of providing income. We classify a fund as belonging to the Income category when its strategy focuses on providing income, or the fund self-identifies as using an income strategy even though it may incorporate other factors in addition to income.

**Value:** A fund that invests primarily in the stocks that are considered undervalued using metrics such as price-to-earnings, price-to-book, EV/EBITA, etc.

**Growth:** A fund that invests primarily in fast-growing stocks using metrics such as earnings growth, sales growth, momentum, etc.

**Momentum:** A fund that invests primarily in high momentum stocks using metrics such as period returns.

**Quality:** A fund that invests primarily in high quality stocks using metrics like ROE, debt/equity and earnings growth.

**Low Vol or Risk:** A fund that aims to achieve reduced portfolio volatility, either by screening for low volatility stocks, low beta stocks and/or minimizing the portfolio volatility.

**Other:** Any non-cap weighted factor strategy that is not covered by otherwise defined categories. This includes equal-weight, multi-factor, AlphaDEX and other fundamental-based ETFs.

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