

# Understanding Investor Preferences through Passive Investment Flows

**Hamish Seegopaul**, Managing Director, Global Head of Index Product Innovation, STOXX  
E: [hseegopaul@iss-stoxx.com](mailto:hseegopaul@iss-stoxx.com)



Acknowledgements: The author would like to thank Tony Renshaw for his useful comments and help with data wrangling.

**Table of Contents**

- 1. Introduction \_\_\_\_\_ 3
- 2. Passive investor preferences – Study methodology \_\_\_\_\_ 3
- 3. Results – Year by year \_\_\_\_\_ 6
  - 3.1 Descriptive info for ETF market \_\_\_\_\_ 6
  - 3.2 Annual factor exposures, past 10yr \_\_\_\_\_ 6
  - 3.3 Annual flow statistics, past 10yr \_\_\_\_\_ 9
  - 3.4 Correlation vs causality \_\_\_\_\_ 10
- 4. Results – Aggregated over time \_\_\_\_\_ 10
  - 4.1 Exposures \_\_\_\_\_ 10
  - 4.2 Total statistics, past 10yr \_\_\_\_\_ 12
- 5. Future work \_\_\_\_\_ 12
- 6. Conclusion \_\_\_\_\_ 13
- 7. References \_\_\_\_\_ 14
- 8. Offices and contacts \_\_\_\_\_ 15

## 1. Introduction

*Revealed preference* theory is one of the foundations of work on consumer demand (Samuelson, 1938), based on the premise that real-life choices reveal a ranking of preferences, or a *utility function*. The theory implies that this ranking contains more information than *stated preferences*, gathered via hypothetical choices. In other words, “actions speak louder than words”.

Within the investment world, there is no greater way to reveal a preference than by putting capital to use. Whether a single trade in a security, an allocation to a fund, a rebalancing of a portfolio or the implementation of an asset allocation scheme – investors may debate the future, but their views are clearly espoused in their holdings.

The transparency afforded by the ETF market (Lettau and Madhavan, 2018) allows for a unique window into the preferences of passive investors. Daily, position-level transparency in conjunction with the create/redeem features of ETFs can show, ex-post, the ‘votes’ investors have made with their dollars and cents.

Using standard ETF classifications to understand revealed preferences, however, can be a blunt instrument – names and categories do not always tell the full story (Ceria and Brown, 2018). For example, are net new assets in dividend ETFs the only indication of a preference for higher yields? Are net new assets in European-focused ETFs the only indication of a preference for higher Europe exposure? Tracking these types of discrete categories can potentially be closer to *stated* preferences than *revealed*.

This article will use the unique feature of ETFs to analyze investor flows, but also look through to the underlying holdings, to come closer to the *revealed* preferences of passive investors, in aggregate. We add to the research done in this area (Blitz, 2017) by examining the evolution of preferences over time. Our key findings are below:

- There has been a high degree of year-on-year variability of style, industry and regional exposures
- There was evidence of ongoing appetite for broad-based exposure
- Over a longer time frame, there was little clear preference of style, industry and regional exposures
- No matter the time frame, there was a preference for ETFs with strong in-year performance

## 2. Passive investor preferences – Study methodology

To measure the allocation preferences of passive investors, ex-post, we create a “Flow Portfolio”, which is comprised of securities that were theoretically bought or sold in order to facilitate ETF inflows/outflows across an ETF universe. The security weights reflect the total amount bought and/or sold per security.

This approach has two main benefits. Firstly, as our goal is to measure preferences of all investors, we must isolate the active allocation decisions, i.e. actions that change the overall mix of all ETFs held. The results of these actions can be at least partially attributed to a change in preference<sup>1</sup>. Secondly, a granular, holdings-level view will enable analytics that go beyond typical time-series regression analyses.

---

<sup>1</sup> Another source could be a switch of investment vehicle, i.e. an active fund or mutual fund to a similar ETF.

For this analysis, we restrict our universe to US Equity ETFs with more than one year of history, which allows for the most robustness in our results, while covering the bulk of all ETF assets.<sup>2</sup> Whether these results can be generalized to global ETFs and other asset classes is an area of potential future work. The process of creating the portfolio, and the reasoning behind each step, is described below.

### Step 1: Calculating Net New Assets per ETF

Most trading of ETFs – about 80% - happens on the secondary market, meaning there is a matched buyer and seller. For the remainder of orders, the supply/demand imbalance is managed by an Authorized Participant (AP), who can hedge the additional activity needed to facilitate a trade – this drives the ETF creation/redemption process. In the case of creations, the AP can deliver baskets of securities to the ETF issuers in exchange for new shares which they release to investors, and thus more shares of the ETF have been brought into existence. The reverse can happen for redemptions.

Net New Assets, which reflects the outcome of any supply/demand imbalance, can thus be measured using the difference in shares of an ETF (i), between two points in time (t).

$$ETF \text{ Net New Assets}_{i,t} = (ETF \text{ shares}_{i,t} - ETF \text{ shares}_{i,t-1}) \times ETF \text{ USD price}_{i,t} \quad (1)$$

ETF flows can be either positive or negative. We use annual, end-of-year values as our measurement points.

### Step 2: Calculating the Flow Portfolio

Using net new assets from step 1, we decompose the total dollar amount (positive or negative) into an asset-level view, for each asset in the ETF (i). This requires a set of weights to multiply with the flow amount, which, for simplicity, we choose the ETF's year-end holdings. Note this is a somewhat of a blunt approach, as holdings change over the course of a year. A full accounting would perform this calculation on a daily basis, matching each day's weights with each day's flow. However, as ETFs track indices with static objectives, and our goal is to measure exposure trends over time, the year-end portfolio exposures should remain reflective of the overall ETF objective. This may mean we miss out on intra-year trends, which is a potential area of further study.

$$Security \text{ ETF New Assets}_{i,t} = ETF \text{ Net New Assets}_{i,t} \times ETF \text{ Security weight}_{i,t} \quad (2)$$

Using the Net New Assets at the security level, we then aggregate per security across all ETFs it is a member of and determine its weight relative to the total net new asset amount.

$$Security \text{ Total Net New Assets}_{j,t} = \sum_i^n Security \text{ ETF New Assets}_{i,t} \quad (3)$$

$$Flow \text{ Portfolio Weight}_{j,t} = \frac{Security \text{ Total New Assets}_{j,t}}{\sum_j^n Security \text{ Total New Assets}_{j,t}} \quad (4)$$

The weight per security can be either positive or negative, depending on the magnitude of the total inflows/outflows of the ETFs it is held in. This also means the portfolios may exhibit leverage (the absolute value of the weights may not be 100%), however, the sum of weights will be 100%.

<sup>2</sup> The US ETF market is by far the largest globally, with roughly 70% of global ETF AUM in 2023. As flows are measured annually, we restrict the universe to ETFs with at least one year of history.

### Step 3: Creating the taxonomy of preferences

There are numerous dimensions investors will consider when making any capital allocation decision. For this analysis, we will rely on dimensions that are at the intersection of return/risk drivers, ease of measurement with our data available and commonly requested analytics by investors familiar with risk models. These are listed below.

**Exhibit 1:** Preferences taxonomy.

1. Style Factors	2. Industry Factors	3. Regional Factors
Dividend Yield	Consumer Discretionary	Americas Developed
Earnings Yield	Consumer Staples	EMEA Developed
Exchange Rate Sensitivity	Energy	APAC Developed
Growth	Financials	Americas Emerging
Leverage	Health Care	EMEA Emerging
Liquidity	Industrials	APAC Emerging
Market Sensitivity	Information Technology	
Medium-Term Momentum	Materials	
Profitability	Real Estate	
Size	Telecommunication Services	
Value	Utilities	
Volatility		
<b>4. Total Performance</b>	<b>5. Number of Names</b>	

Source: STOXX.

A brief description of each of the elements, and where they are commonly utilized, is below:

**Style Factors** – Investment styles which are commonly used to decompose the risk of a portfolio. A subset of these factors is commonly associated with factor investing (Ang, 2014), also referred to as smart beta in the ETF landscape. They are reported as Z scores, normalized across a global universe.

**Industry Factors** – % of portfolio weight, based on an industry classification.

**Regional Factors** – % of portfolio weight, based on the home country of the individual securities contained in the ETF.

**Total Performance** – Gross return of ETF.

**Number of Names** – Total number of holdings in ETF.

When aggregating for the Flow Portfolio, or All ETFs, data points are aggregated as AUM-weighted averages. All data is sourced from the Axioma Worldwide Medium Horizon Risk Models.

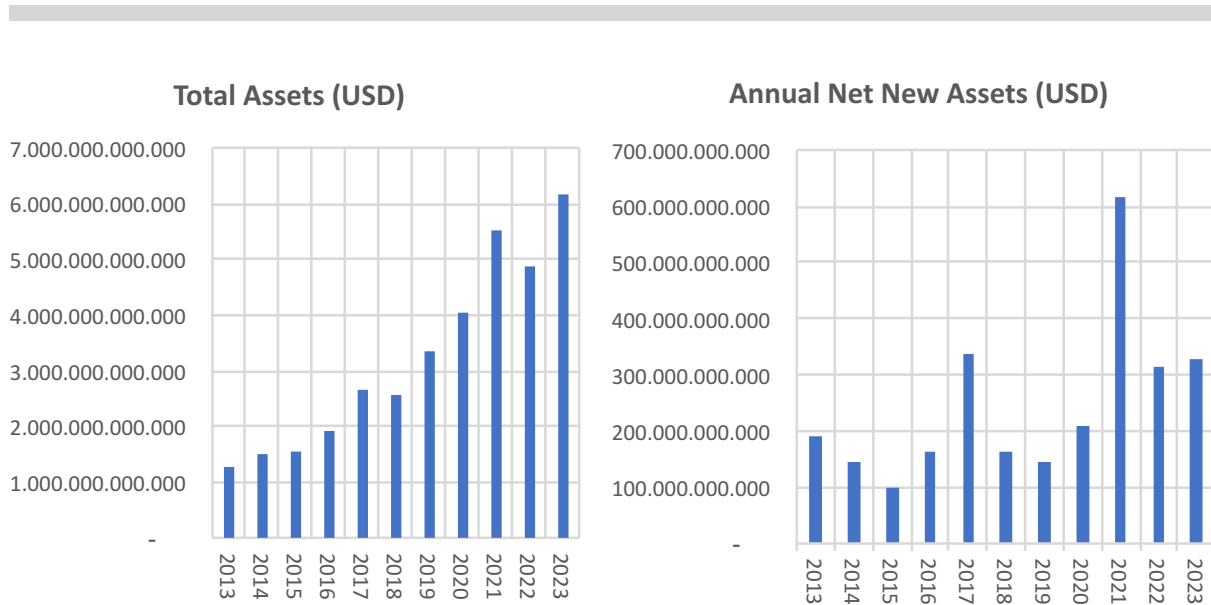
For each year and annual flow portfolio, we measure the exposures / levels of each of these five dimensions independently.

### 3. Results – Year by year

#### 3.1 Descriptive info for ETF market

We start with AUM and total flows of our dataset over time, the results of which will present no surprises to followers of the ETF story. AUM has trended higher over time, both due to the tailwind of an extended bull market, and ongoing inflows.

**Exhibit 2:** Total market capitalization and flows.



Source: STOXX, Axioma. Data from 2012 through 2023.

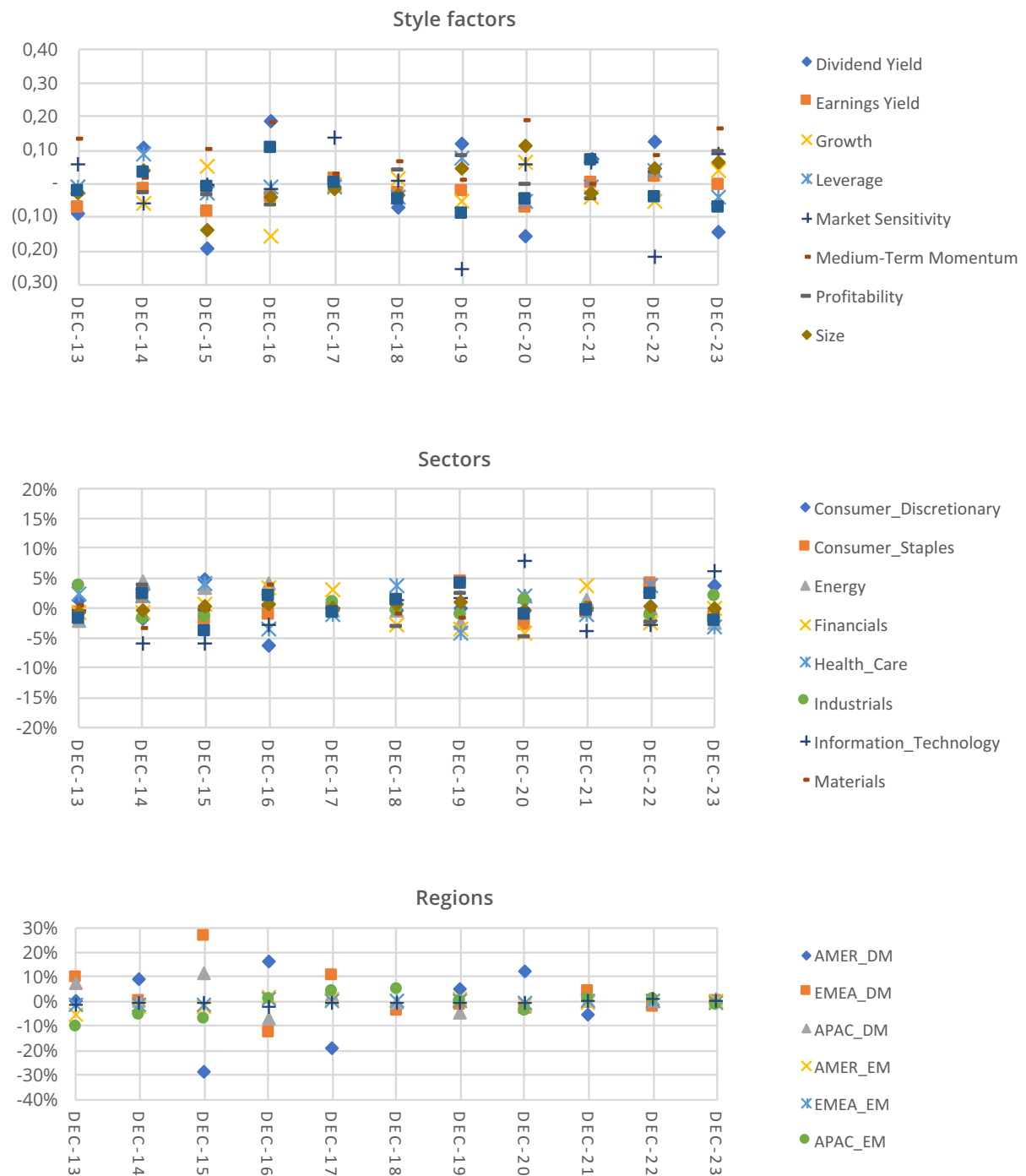
#### 3.2 Annual factor exposures, past 10yr

Next, we show the *active* exposures of the annual flow portfolios. Active exposures are always calculated vs. a benchmark – here, we choose the entirety of holdings of our ETF universe<sup>3</sup>. This approach introduces some exposure biases vs. a standard, global, cap-weighted benchmark (for example, US ETF holdings tend to have more home country bias, be larger and more liquid), but our goal is to highlight what the aggregate passive investor is choosing to own, versus what they already own.

Another way to interpret the active exposure is (e.g.): for the year 2022, what was the exposure, in aggregate, of all the securities that ETF issuers / APs theoretically bought or sold to hedge creates/redeems, vs. the exposure of all the existing securities held by all ETFs. As a reminder, style factor exposures are shown as z-scores, whereas industry and geographic exposures are shown as the difference in % weight.

<sup>3</sup> US Equity ETFs with 1yr of history in our data source.

**Exhibit 3:** Active exposures over time.



Source: STOXX, Axioma. Data from 2012 through 2023.

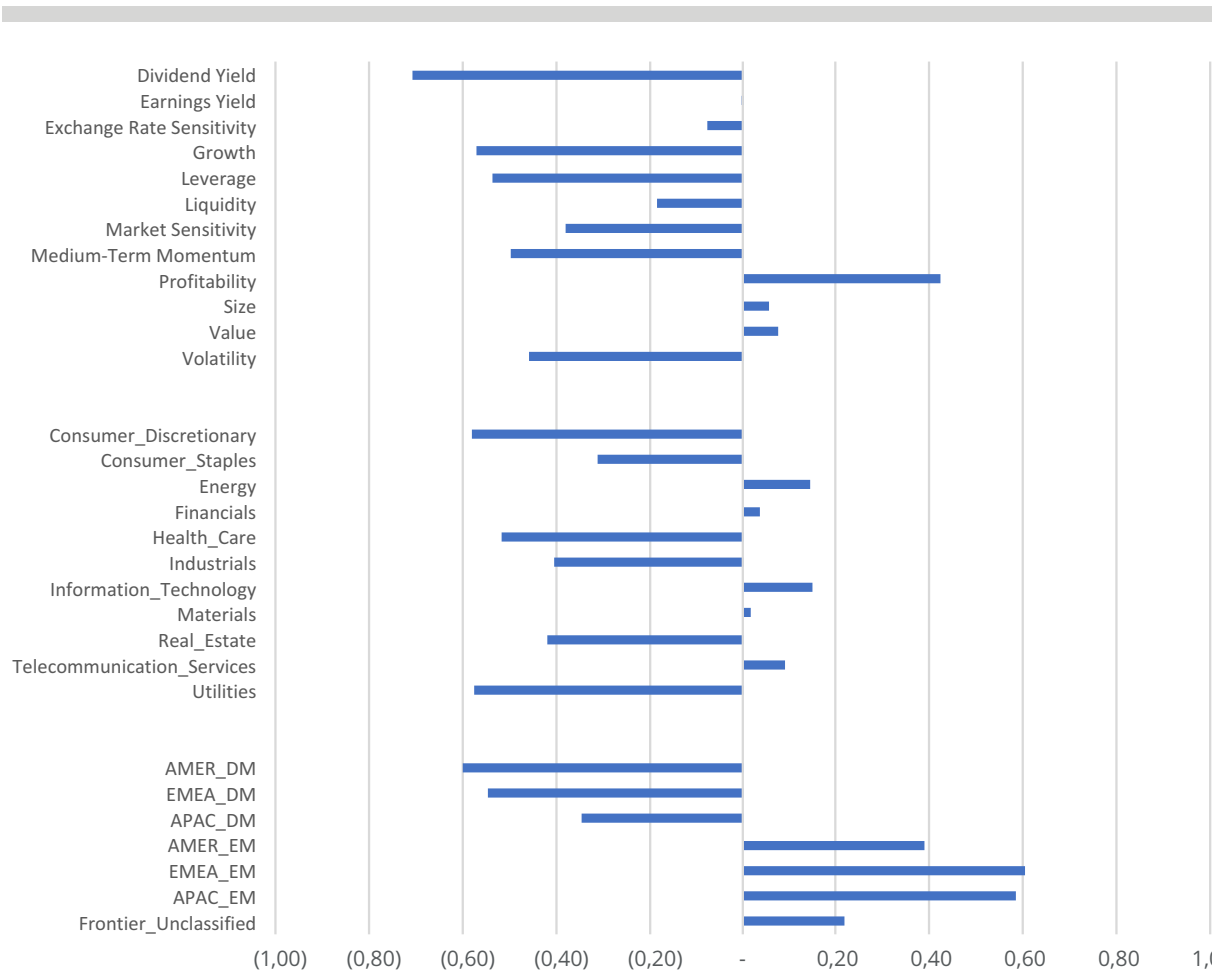
Many of these results track intuition – for example, in 2020, investors shunned dividend paying stocks, favored Information Technology and the Americas. Whether looking at styles, sectors or regions, however, there is a clear takeaway – **preferences change over time**. In other words, the year-on-year preferences across factors are variable.

When looking through a style factor lens, there is an element of factor timing at play, the difficulty of which has been well documented (Asness et al., 2017). This may not be as readily observable by looking at flows into specific ETF categories (for example, Quality ETFs), however, each ETF is a mix of exposures, and the aggregated flows reveal individual styles coming in and out of favor.

To measure the persistence in trends, we can also look at the autocorrelations of the exposures, i.e. how correlated the exposure levels are with its level in the previous year. A correlation of 1 in this case will indicate a perfect tendency for the exposures to move in the same direction and strength year-on-year, while -1 will indicate a perfect tendency for the exposures to fully reverse each year.

$$\rho_1 = \frac{\text{Covariance}(exposure_t, exposure_{t-1})}{\sqrt{\text{Variance}_t} \times \sqrt{\text{Variance}_{t-1}}} \quad (5)$$

**Exhibit 4:** Annual autocorrelations (1-year lag) of exposures.



Source: STOXX, Axioma. Data from 2012 through 2023.

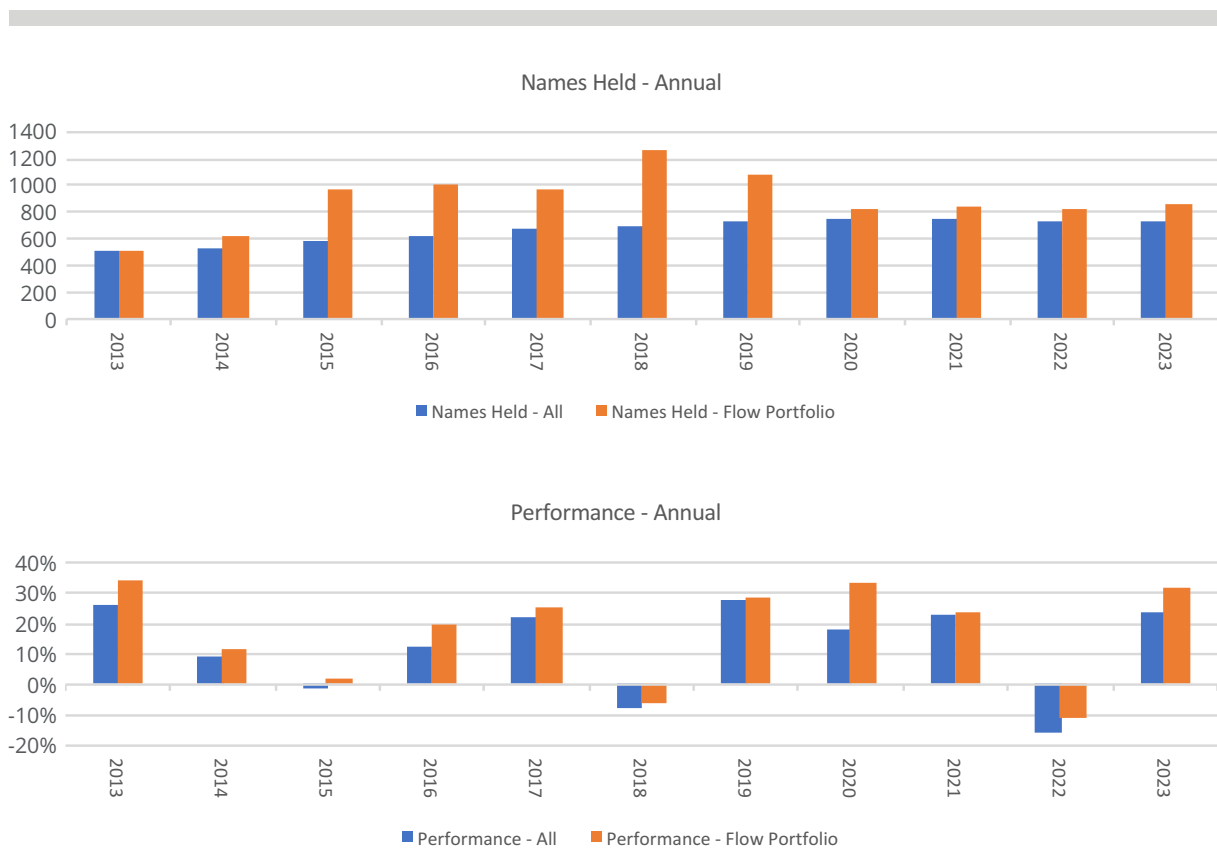


While some exposures, such as that to Emerging Markets, have received consistent attention from investors over the time of our study, there are a number of exposures that exhibit mean reverting characteristics. Dividend Yield is especially notable – highlighting a preference for dividend exposure in one year may indicate a reversal of preference in the following year. However, there remains a high variability of tendencies across the exposures.

### 3.3 Annual flow statistics, past 10yr

For the remaining dimensions, we observe the characteristics of the annual flow portfolio, and show alongside the characteristics of all ETFs in our universe.

**Exhibit 5:** Names and performance levels over time.



Source: STOXX, Axioma. Data from 2012 through 2023.

When looking at these additional dimensions, we see evidence of persistent trends. For each of the dimensions measured, investors have shown a preference for “more” – more names and more performance.

With regards to names, this finding highlights the dominance – on an AUM basis – of broad, diversified portfolios. While Thematic ETFs, along with the narrower set of holdings, have captured the attention of both ETF issuers and end investors, the preference for a higher number of names indicates continued usage of ETFs for core holdings.

In perhaps the least surprising observation, however, investors are allocating to ETFs which exhibit strong in-year performance. There are some caveats with this view, as it should be indicative of a preference for performance (future or past), not necessarily implying that investors capture it. Performance for this study is measured contemporaneously with the flows, meaning we match the total 2022 flows with the full 2022 performance of the ETF (whereas investors may have allocated money at the start of the year, implying more foresight than performance chasing).

This finding relates to a common investor issue of the “returns gap”, dating back to the heyday of mutual funds (Friesen and Sapp, 2007). Returns reported on (e.g.) fact sheets reflect a “buy and hold” strategy over a full time period, (e.g. 1 year, 5 years, since inception, etc.), whereas in reality, investors make contributions and withdrawals to funds over time. Using dollar-weighted averaging (reflecting contributions/withdrawals), as opposed to standard time-weighted averaging (reflecting buy/hold), researchers have found that the returns achieved by investors tend to lag the returns of the funds they are invested in (Madhavan and Sobczyk, 2018), on average. This is attributable to the challenge of market timing, and the risk of selling dips and buying tops. A preference to allocate to ETFs with strong in-year performance can exacerbate this challenge.

### 3.4 Correlation vs causality

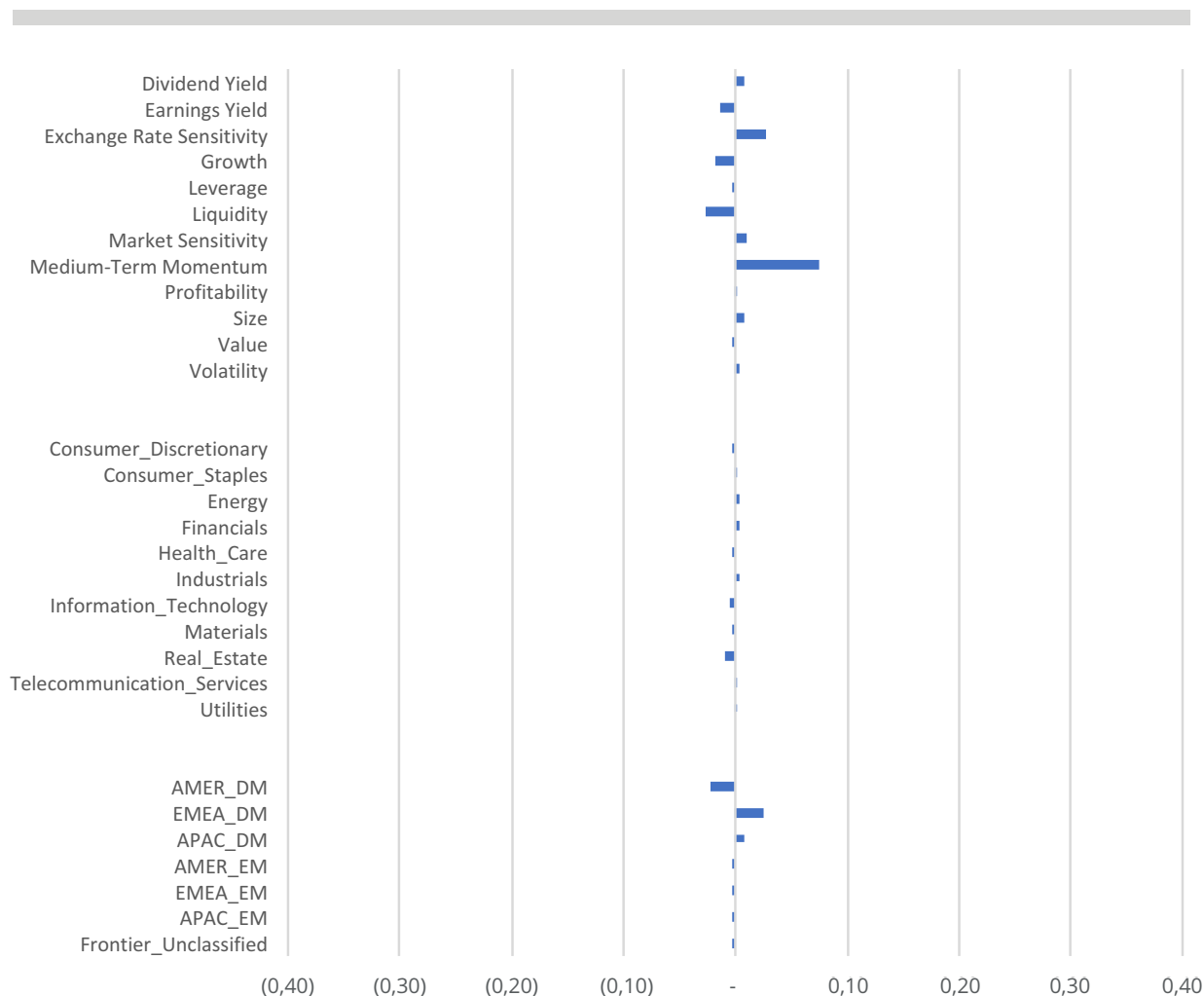
In section 3, we have shown the high degree of variability in certain exposures over time (styles, industries, regions), while shown persistence in others (names, performance). It is difficult, however, to establish a definitive causal link between preferences and flows, as this ideally requires some notion of ex-ante preferences. In addition, there can be other factors driving changing investment preferences which have less to do with exposures, for example, flows into ETFs which have lower costs of ownership. While acknowledging these limitations, our paper’s main observations come from comparing the year-on-year results with the results over time, in the following section.

## 4. Results – Aggregated over time

### 4.1 Exposures

To arrive at the total exposures over time, we create a portfolio which is the weighted sum of all the individual annual portfolios, and measure its exposure. This is effectively the same as an AUM-weighted average of the individual exposures of each year.

**Exhibit 6:** Aggregate exposures across full period.



Source: STOXX, Axioma. Data from 2012 through 2023.

Remarkably, while we observed a fair degree of variability in the year-on-year exposures, when measured over time, **the variability mostly disappears.**

Momentum remains somewhat of an outlier, which correlates with our finding on a preference for strongly performing ETFs. However, with an aggregate exposure of 0.07 standard deviation relative to the benchmark, even this is a weak signal<sup>4</sup>.

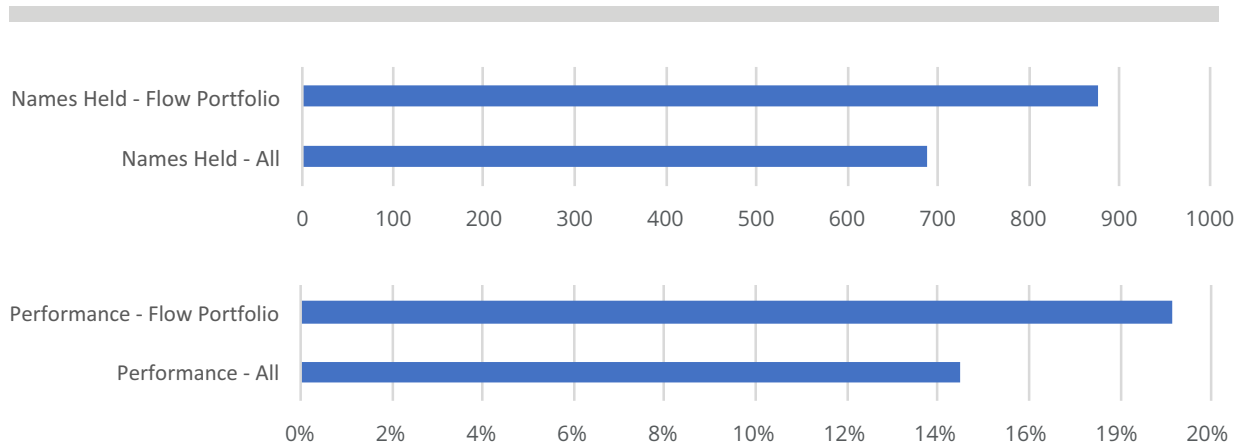
The only other notable shift in aggregate exposure is the one away from the Americas and towards EMEA and APAC. As the US equity ETF market has historically been dominated by funds linked to the S&P 500, this shift can largely be seen as a diversification preference, i.e. allocating more towards global exposures.

<sup>4</sup> Generally, we consider exposures above 0.25 to be significant.

## 4.2 Total statistics, past 10yr

Given the consistent trends we saw in the annual results with regards to number of names and performance, there are no surprises in the aggregated data. When combining all the annual flow portfolios, the total portfolio exhibits higher names and performance.

**Exhibit 7:** Names and performance over full period.



Source: STOXX, Axioma. Data from 2012 through 2023.

Across our sample, the standard deviation of annual returns of our ‘All ETFs’ portfolio is roughly 15%, meaning the performance preference is a roughly 0.3 standard deviation shift upwards. This is notably higher than any of the style factor exposures.

What to take away from these statistics? **In the short run, preferences can be highly variable. In the long run, there is one preference to rule them all – and that is performance<sup>5</sup>.**

## 5. Future work

Designing solutions for investors always begins with an objective – what is the problem trying to be solved. From here, the challenge is twofold – how to design the objectives based on a problem, and how to construct the portfolio such that the outcomes reflect this objective. As we have seen from the aggregate choices of the US ETF investor, preferences – styles, industries and geographics – can vary over time. This variability supports a rich environment of products to allow investors to express these preferences.

The unsurprising preference for performance leads to questions beyond the scope of this article. The “returns gap” mentioned previously remains a challenge for the investment management industry to enable the best outcome for investors. A preference to allocate to above-market returns compounds the challenge.

<sup>5</sup> This conclusion refers to the *preference* for performance, *not* whether investors successfully capture it.

When it comes to the benefits of understanding preferences, however, they can allow for more straightforward portfolio construction. Preferences can combat analysis paralysis, by serving as useful dimension reduction tools. For example, knowing you seek a high dividend yield, are bullish on Utilities, bearish on Europe and care about ESG exposure should allow you to assemble a portfolio that meets all your objectives, while only “selecting” four dimensions. This sort of custom work has historically been done by index providers for more institutional clients, but the proliferation of advanced analytic and portfolio construction tools can enable broader usage.

This is, of course, further complicated by where we started the article – there is a difference in *stated* vs. *revealed* preferences. This article presents a view of granular preferences, ex-post. Gaining a better understanding of preferences ex-ante, and what to do with them, is an exciting area of finance, and an area of our future work.

## 6. Conclusion

In this paper, we have used the transparency afforded by ETFs to study the time-varying preferences of passive investors, using their investment allocation decisions. We have found that year on year, there is a great deal of variability in style, industry and regional exposures, however, over time the allocations are fairly neutral in nature. This is in contrast to a preference for performance, which is consistent over time, reflected by flows going towards ETFs with strong in-year performances.

These findings support a rich product landscape, however, pose challenges for the industry. Some challenges – such as the “returns gap” – have been sticky. Others, such as understanding preferences prior to investment decisions, will lead to further innovation.

## 7. References

Ang, A., 2014. *Asset management: A systematic approach to factor investing*. Oxford University Press.

Asness, C., Chandra, S., Ilmanen, A. and Israel, R., 2017. Practical Applications of Contrarian Factor Timing Is Deceptively Difficult. *Practical Applications*, 5(3), pp.1–5.

Ben-David, I., Franzoni, F. and Moussawi, R., 2016. *Exchange traded funds (ETFs)* (No. w22829). National Bureau of Economic Research.

Blitz, D., 2017. Are Exchange-Traded Funds Harvesting Factor Premiums? *Journal of Investment Consulting*, 18(1).

Ceria, S. and Brown, M., 2018. What's in a name? Part 2: Stress-Testing Smart Beta ETFs. Technical report, Axioma Applied Research.

Dirkx, P.A., 2019. European ETF Factor Exposures: Evidence from a Regression-and Holdings-Based Analysis. *The Journal of Beta Investment Strategies*.

Friesen, G.C. and Sapp, T.R., 2007. Mutual fund flows and investor returns: An empirical examination of fund investor timing ability. *Journal of Banking & Finance*, 31(9), pp.2796–2816.

Lettau, M. and Madhavan, A., 2018. Exchange-traded funds 101 for economists. *Journal of Economic Perspectives*, 32(1), pp.135–154.

Madhavan, A. and Sobczyk, A., 2019. Does trading by ETF and mutual fund investors hurt performance? Evidence from time-and dollar-weighted returns. *Journal of Investment Management*, 17(3), pp.1–17.

Samuelson, P.A., 1938. A note on the pure theory of consumer's behaviour. *Economica*, 5(17), pp.61–71.

## 8. Offices and contacts

Learn more about STOXX & DAX Indices on [stoxx.com](https://stoxx.com)

### Zug

Theilerstrasse 1A  
6300 Zug  
Switzerland  
P | 41 43 430 71 60

### London

8 Old Jewry  
4th Floor  
London EC2R 8DN  
United Kingdom  
P | +44 20 7862 7680

### Frankfurt

Taunus Tower  
Mergenthalerallee 73-75  
65760 Eschborn  
Germany  
P | +49 69 2 11 0

### Paris

5 Rue du Renard  
75004 Paris  
France  
P | +33 1 55 27 38 38

### Prague

Futurama Business Park Building E  
Sokolovska 662/136e  
186 00 Prague 8  
Czech Republic  
P | +420 228 889 234

### New York

17 State Street  
Suite 2700  
New York, NY 10004  
USA  
P | +1 212 991 4500

### Hong Kong

Unit 901, 9/F  
100 Queen's Road Central  
Hong Kong  
P | +852 3107 8030

### Singapore

80 Robinson Road, #02-00  
Singapore 068898  
Singapore  
P | +852 3107 8030

### Sydney

68 Pitt Street  
Level 17  
Sydney, NSW 2000  
Australia  
P | +61 2 8074 3104

### Call a STOXX representative

Customer support  
[customersupport@stoxx.com](mailto:customersupport@stoxx.com)  
P | +41 43 430 72 72



Part of  DEUTSCHE BÖRSE  
GROUP

STOXX Ltd. (STOXX) and ISS STOXX Index GmbH (together "STOXX") research reports are for informational purposes only and do not constitute investment advice or an offer to sell or the solicitation of an offer to buy any security of any entity in any jurisdiction. Although the information herein is believed to be reliable and has been obtained from sources believed to be reliable, we make no representation or warranty, expressed or implied, with respect to the fairness, correctness, accuracy, reasonableness or completeness of such information. No guarantee is made that the information in this report is accurate or complete, and no warranties are made with regard to the results to be obtained from its use. STOXX will not be liable for any loss or damage resulting from information obtained from this report. Furthermore, past performance is not necessarily indicative of future results. Exposure to an asset class, a sector, a geography or a strategy represented by an index can be achieved either through a replication of the list of constituents and their respective weightings or through investable instruments based on that index. STOXX does not sponsor, endorse, sell, promote or manage any investment product that seeks to provide an investment return based on the performance of any index. STOXX makes no assurance that investment products based on any STOXX® or DAX® index will accurately track the performance of the index itself or return positive performance. The views and opinions expressed in this research report are those of the author and do not necessarily represent the views of STOXX. This report may not be reproduced or transmitted in whole or in part by any means – electronic, mechanical, photocopying or otherwise – without STOXX's prior written approval.