January 2022 / Investment Insights

Systematic Investment Solutions:
How 'smart' are style ETF flows?

With their massive rise in AUM over the last decade, ETFs proved to be a popular investment instrument to build up passive exposures to markets. In the last few years, style ETFs, focusing on common risk factors, also gained a significant market share. While the general idea of gaining exposure to risk factors is passive, investors need to take an active allocation decision between different styles. Therefore, these style ETFs differ significantly from previous ETFs and investors might underperform their benchmarks as seen in mutual funds (see e.g. Frazzini and Lamont, 2008).
This paper aims to better understand if the style ETF investors on average follow past returns and whether they successfully time the market or not. Our key findings are that style ETF investors significantly hurt their own performance due to their timing and on average invest in styles with high previous returns. Possible solutions to these findings include holding style ETFs over a longer time horizon and using diversification instead of pure style allocations.

Introduction

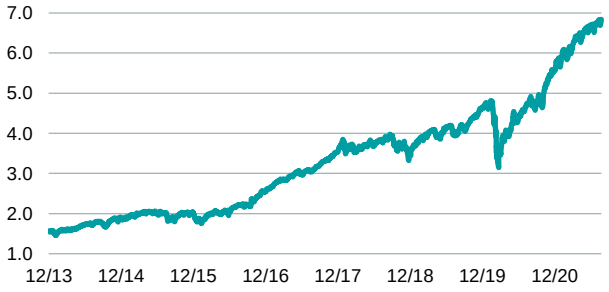
The rise of ETFs

Since their first appearance in 1993, Exchange Traded Funds (ETFs) gained a substantial market share in the portfolios of investors. Over the last 7 years, our ETF sample AUM rose by nearly 340% from 1.56 trn to 6.84 trn USD. This massive rise in AUM was driven by high inflows as well as performance gains.

Multiple reasons impacted this overall trend to ETFs. For example, a high market efficiency might favor passive investments. In addition, more recent developments in the ETF market introduced style ETFs, which address specific investor needs instead of tracking the overall market. Therefore, benchmarks such as MSCI factor style indices or fully custom benchmarks become more common.

In contrast to the classic approach of passive investing, style ETFs provide exposure to a specific style thereby representing an active investment decision to deviate from simple purely passive strategies aiming to duplicate the market. Therefore, investors will typically try to outperform the market by using top-down allocations between different styles.

FIGURE 1. TOTAL AUM OF ETFS IN USD TRN



Source: Refinitiv. As of: August 2021. Sample includes the 1,935 largest ETFs.

In this paper we want to further understand whether the average style ETF investor succeeds in beating the market or not. In addition, this paper gives a thorough analysis of the style ETF market, focusing on Growth and Value strategies.

Structure of this paper

We structure our analysis as follows: First, we introduce concepts that highlight how ETF returns and flows might be related. Second, we explore the rise of style ETFs using descriptive analysis. Third, we analyze the relation between flows and returns for the average Value and Growth ETF investor. Here, we present visual correlations and determine whether flows lag returns or the other way around. In addition, we compare time-weighted and money-weighted returns in these ETFs to understand whether investors' timing decisions increase their performance or not. Fourth, we test a simple flow-based strategy to further understand if style ETF flows can be used for allocation decisions or not. Lastly, we present a summary and conclusions of our findings.

Related literature

Concepts and hypotheses

Overall, we investigate two main hypotheses for our analysis. Previous literature on mutual fund flows established and explored theories to support both of them theoretically which we will transfer to our ETF flow sample. We mainly follow Warther (1995) in developing these hypotheses.

On the one hand, style ETF investors might succeed in timing their benchmark. Therefore, high inflows should be followed by high returns and the money-weighted average return should exceed the time-weighted return.
Possible explanations for this result are that this investor group possess information not priced in the market and acts accordingly or a price pressure on the underlying securities due to high inflows moving the overall market. As the share of style ETFs compared to the total Equity market is relatively small, we focus on the first explanation.
Considering these ideas, our first hypothesis is as following:

Hypothesis 1: Style ETF investors succeed in timing their benchmark and earn unexpected high returns.

On the other hand, the average investor might underperform the general market. In this context, high inflows would be followed by relatively low returns and the money-weighted average return should be below the time-weighted return.
In this case, investors might suffer from behavioral biases. For instance, they might exaggerate the relevance of past performance to predict future performance or follow a simple return-chasing behavior. In addition, other effects such as the gamblers fallacy can introduce further reasons for an underperformance.

Hypothesis 2: Style ETF investors simply follow past returns in their investment decisions.

Previous literature on mutual fund flows

When looking on empirical research on the 'smartness' of mutual fund flows, different findings prevailed. Early research mainly found that past flows predict future performance. Gruber (1996) attributes his findings to both a persistent momentum effect and superior management. Transferring these findings to the style ETF market, investors might outperform the general benchmark by both timing and allocation decisions. Zheng (1999) further adds evidence on flows predicting performance, but also contributes his results in part to a positive momentum in his data. Due to the robustness of his results, he introduced the term 'smart money'.

In contrast to these first results, more recent studies mostly find opposite results. Edelen and Warner (2001) extended Warthers (1995) research by using more frequent data and could not find any outperformance. Further on, Frazzini and Lamont (2008) strongly reject the 'smart money' hypothesis by constructing a custom flow indicator of stocks. They find that mutual fund investors excessively destroy wealth by their decisions and subsequently talk about the 'dumb money' effect.

Related literature on ETFs

The empirical literature on ETF flows is relatively scarce due to their recent rise to prominence and mostly focuses on the overall ETF market and not style ETFs.

For example, Henderson and Buetow (2014) try to determine whether the overall ETF investor succeeds in timing the market. By simply comparing the average returns after positive and negative flows, they find that negative flows are preceeded by low returns and the other way around. In addition, a portfolio formation does not lead to any significant outperformance.

Other pieces of research try to determine what drives ETF flows. Here, Clifford et al. (2014) focus on the fund-level determinants of inflows. They find that most ETF flows are significantly affected by past returns. When looking at the impact of flows on returns they do not find any significant alpha.

Descriptive Analyses

Data

Our dataset consists of the largest 1,935 ETFs to our knowledge. We might suffer from a small survivorship bias, but as the ETF market is relatively young and concentrated this effect should be neglectable. Their historical values from the end of 2013 until August 2021 are retrieved from Refinitiv Datastream. Next to the prices, we calculate net flows based on daily data for creations and redemptions of shares. To further identify style ETFs we use a distinguished custom classification based on the benchmarks and fund names.

While our total sample includes ETFs from all over the world, including US, European and Asian Pacific oriented funds, the style ETFs are dominated by funds with an US focus. Up to 96% (Growth ETFs) of their AUM are US focused, compared to 64% in the initial overall sample.

Describing our sample

General descriptive statistics on our sample are presented in Table 1. The total ETF market seems to behave relatively in line with our expectations: The average annualized return is between the average performance of the MSCI World ACWI and MSCI World index during the same timeframe.

Interestingly, Value ETFs have the highest inflows and perform the worst, while the best performing Growth ETFs have the lowest flows. The total ETF market flows and returns are both in between the values of Value and Growth ETFs.

TABLE 1. DESCRIPTIVE STATISTICS

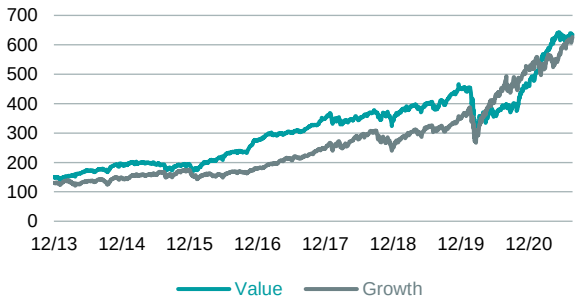
	Total	Value	Growth
Number of Funds	1,935	152	85
AUM in bn USD	6,839	635	627
Total inflows in bn USD	2,391	291	109
Annualized mean flow	9.5%	12.0%	4.8%
Annualized mean return	10.6%	9.5%	17.1%

Source: DWS International GmbH, Refinitiv. As of: August 2021.

Flow and AUM development

In addition to these general numbers, we investigate the development of AUM as well as aggregated Flows in Figure 2 and Figure 3.

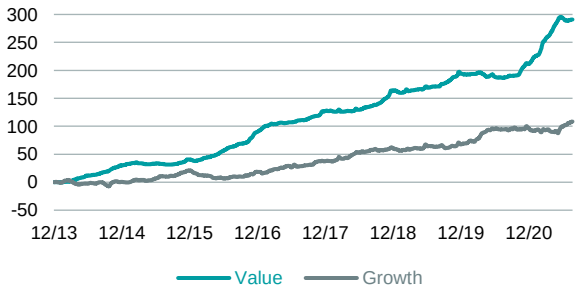
FIGURE 2. AUM DEVELOPMENT OF STYLE ETFS (IN BN USD)



Source: DWS International GmbH, Refinitiv. As of: August 2021.

Both style ETF classes saw a massive increase in their AUM. They increased from below 150 bn to over 600 bn USD for each style. Value ETFs had relatively high and mostly stable inflows over the total time, whereas aggregated Growth ETF flows were slowly rising with a small flow jump in 2020. Afterwards, new inflows stagnated until the beginning of 2021. To summarize, the growth in AUM is mostly driven by performance for Growth style ETFs, while flows had a bigger impact on the AUM of Value style ETFs.

FIGURE 3. AGGREGATED FLOWS OF STYLE ETFS (IN BN USD)

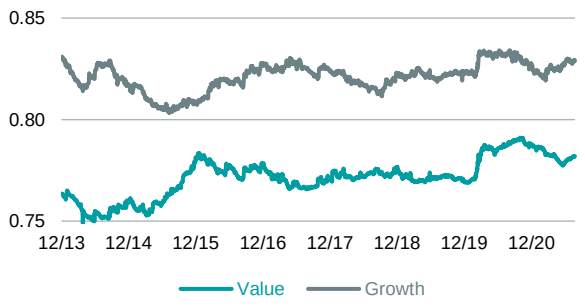


Source: DWS International GmbH, Refinitiv. As of: August 2021.

Concentration of AUM

To further understand the maturity and competitiveness in these style ETF markets, we calculate the Gini Coefficient of the AUM over time.

FIGURE 4. GINI COEFFICIENT OF STYLE ETFS OVER TIME



Source: DWS International GmbH, Refinitiv. As of: August 2021.

Both Gini coefficients for the AUM concentration of style ETFs are relatively large, although the AUM of Growth style ETFs are more concentrated in our sample.

Still, both Gini Coefficients are consistently smaller than the total market Coefficient, which is close to 0.85. Accordingly, there seems to be a relatively broad offering of Value and style ETFs with a large offering of funds and lower concentration than in the total ETF market.

Correlations between different strategies

In addition to these univariate descriptions of the flows and returns, we also analyze the interaction between the different categories. Here, we present daily flow and return correlations in Table 2 and Table 3.

TABLE 2. FLOW CORRELATIONS BETWEEN STRATEGIES

	Total	Value	Growth
Total	100%		
Value	46%	100%	
Growth	42%	48%	100%

Source: DWS International GmbH, Refinitiv. As of: August 2021.

While the flows are positively correlated, as expected from the previous figures, the magnitude of the correlation is surprisingly low. Therefore, investors seem to significantly differentiate between these styles for their asset allocation.

TABLE 3. RETURN CORRELATIONS BETWEEN STRATEGIES

	Total	Excess Value	Excess Growth
Total	100%		
Excess Value	15%	100%	
Excess Growth	23%	-19%	100%

Source: DWS International GmbH, Refinitiv. As of: August 2021.

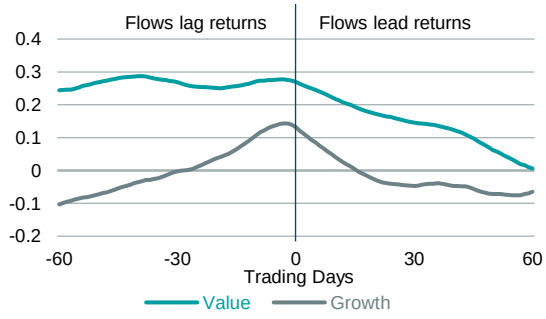
Here, the active returns behave as expected: Active Value and Growth returns show a negative correlation. In addition, the active returns of both styles are slightly positively correlated to the total ETF market returns.

The connection between ETF flows and returns

Graphical analysis

We first use correlations to understand whether flows lag or lead returns. For this analysis, we calculate correlations between the average monthly relative return and flow. By lagging the returns, we can directly observe whether past flows are highly correlated with current returns or the other way around.
To minimize regional effects, we only use ETFs focusing on the US in all further analyses. Our results are shown in Figure 5.

FIGURE 5. CORRELATIONS BETWEEN FLOWS AND RETURNS



Source: DWS International GmbH, Refinitiv. As of: August 2021.

Here, past returns are found to be robustly and highly positively correlated with current flows regarding Value ETFs. This again supports hypothesis 2 and hints at investors trailing high returns. For Growth investors, this relation is weaker, although the highest correlation is between the returns from 3 days ago and current flows.
Still, the Growth perspective might be slightly biased due to the timing of inflows.

Time-weighted and Money-weighted rate of return

To test whether investors' behavior affects their realized returns or not, we furthermore calculate time-weighted returns (TWR) and money-weighted returns (MWR). We follow Dichev (2007) for calculating the TWR and MWR as well as Friesen and Sapp (2007).

The MWR is defined as the Internal Rate of Return of the flows, taking the exact timing of in- and outflows into account. Specifically, it is calculated as following:

$$NPV = \sum_{i=0}^{n} \frac{CF_i}{(1+MWR)^i} = 0$$

In contrast to this, the TWR is calculated as the geometric average return.

$$TWR = \left(\prod_{i=0}^{n}(1+r_i)\right)^{1/n}$$

If the TWR is larger than the MWR, the average investor underperforms the market due to timing decisions. In this case, a simple buy and hold strategy would yield higher returns by realizing the TWR for the investor.

TABLE 4. ANNUALIZED TIME-WEIGHTED AND MONEY-WEIGHTED RETURNS

	Money-weighted return	Time-weighted return	Difference	p-Value
Total	11.5%	13.4%	-1.9%	0.001
Value	7.8%	10.0%	-2.3%	0.001
Growth	15.7%	17.1%	-1.4%	0.003

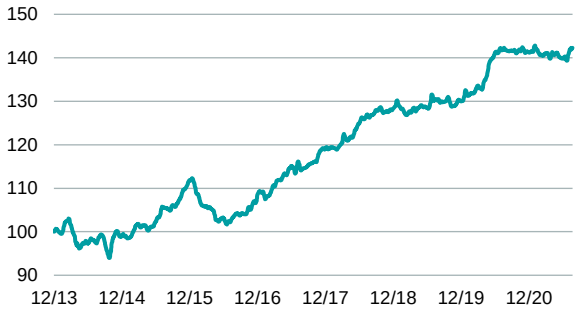
Source: DWS International GmbH, Refinitiv. As of: August 2021. P-Values are calculated on the Null hypothesis of a difference of zero using a jackknife approach.

The timing decisions of value investors have significantly hurt their overall performance as their MWR is consistently smaller than the TWR. The underperformance is lowest with Growth ETFs, although we suspect this might be biased due to the timing of flows.

Recent style ETF investors' performance

Next to analyzing the total sample, we also investigate the MWR and TWR in a more recent timeframe. In our sample, there is a significant jump of Growth ETF flows in the second half of 2020 (see figure 6).

FIGURE 6. INDEXED GEOMETRIC FLOW DEVELOPMENT TO GROWTH ETFS AS % OF AUM



Source: DWS International GmbH, Refinitiv. As of: August 2021.

The comparatively low difference between MWR and TWR of Growth style ETFs might be due to this large inflow and a flat development thereafter with coincidental high returns, shifting the MWR closer to the TWR.
To further understand the most recent behavior between the two measures, we present the analysis for data from October 2020 onwards in table 5.

TABLE 5. ANNUALIZED TIME-WEIGHTED AND MONEY-WEIGHTED RETURNS SINCE FLOW JUMP

	Money-weighted return	Time-weighted return	Difference	p-Value
Total	34.2%	39.8%	-5.6%	0.001
Value	36.2%	43.9%	-7.8%	0.000
Growth	24.2%	35.3%	-11.1%	0.000

Source: DWS International GmbH, Refinitiv. As of: August 2021. P-Values are calculated on the Null hypothesis of a difference of zero using a jackknife approach.

In this subsample, all time-weighted returns are significantly larger than the money-weighted returns. In comparison to the overall analysis, all differences become larger. Especially the Growth ETFs change from the lowest to the largest difference. Therefore, recent developments in the style ETF field with higher AUM and a more widely adoption did not enhance the average ETF investors timing decisions.

A simple flow-based allocation strategy

The strategy

Although the average ETF investor seems to follow past returns, we try to determine whether these decisions might lead to an outperforming investment strategy or not by constructing a simple flow-based strategy:
This strategy invests into the style with higher previous flows with weekly rebalancing. As a benchmark, we use a 50-50 combination of the average Value and Growth ETF performance.

Backtesting results

The results of our backtest are shown in Figure 7. The flow strategy selects Value ETFs more often than Growth ETFs in 58.3% of all dates. Overall, it lags the performance of the diversified 50-50 portfolio.

FIGURE 7. INDEXED PERFORMANCES (01/01/2014 = 100)

Source: DWS International GmbH, Refinitiv. As of: August 2021.

Furthermore, we present the average annual return and risk of both strategies in Table 6. The performance of the flow strategy lags the performance of the 50-50 strategy and exhibits a slightly higher average volatility. The Return/Risk ratio of the flow strategy is also lower compared to the 50-50 strategy.
There seems to be a significant diversification benefit for investing in both styles at the same time compared to choosing one over the other.

TABLE 6. PERFORMANCE INDICATORS OF STRATEGIES

	50-50 Strategy	Flow Strategy
Average return	14.1%	12. 6%
Average volatility	17.1%	17.2%
Return/Risk	0.83	0.73

Source: DWS International GmbH, Refinitiv. As of: August 2021.

Summary and Conclusions

Results

While style ETFs might be an efficient way to provide exposures to common risk factors,[1] the average ETF investor seems to underperform the overall market. Using both correlations and money-weighted returns we show that the average style ETF investor tends to follow high previous returns. This timing seems to hurt their overall performance, resulting in a lower money-weighted return.

How investors could use style exposures

As this paper shows, short term allocations between different style ETFs can lead to an underperformance for the average ETF investor. Investors seem to rather destroy wealth by simply following high past market returns and not time the market successfully.

Still, investors can benefit from using style ETFs.
First, a long-term investor can realize the time-weighted instead of the money-weighted return. In addition to avoiding an underperformance relative to the style factor, stable risk premia can boost the overall performance of this investor.
Second, investors should acknowledge that simple allocations following the markets might not be a solid investment strategy. Therefore, they need to perform better in their allocation than the average market participant, which leads to active investment decisions. They might also benefit from diversification as shown in our backtest.

Instead of building up expertise themselves, investors can resort to the knowledge of passive and active professional asset managers.
DWS offers both passive (Xtrackers) as well as active (Qi Funds) solutions including market opinions for professional investors and turnkey quantitative solutions using dynamic multi-factor approaches.

[1] See Cong (2016)

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