

Timeless Opportunities for Active Systematic Investing in Today's Complex Markets

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INTRODUCTION

Each time the active-versus-passive question appears resolved, the market finds a new way to reopen it. For the better part of two decades, the empirical record has appeared to favor passive strategies because implementation costs are lower, outcomes seem more predictable, and the historical underperformance of the average active manager after fees in the most liquid equity market segments. For instance, over the 10 years ending December 2025, only 11% of active managers in Europe and 21% in the US survived and beat their benchmarks or passive rivals (Morningstar, 2025). This has led many to jump to conclude that active management is a relic of a less efficient era.

Fama's (1970) foundational work on market efficiency established the theoretical benchmark for active management, but even Fama distinguished between degrees of efficiency. The empirical record has not conformed to the strong-form hypothesis, as systematic cognitive biases prevent investors from processing information rationally consistently (Kahneman and Tversky, 1979), and anomalies have proven persistent; price-to-earnings ratios continue to predict returns (Basu, 1977), and momentum effects reward disciplined trend-following (Jegadeesh and Titman, 1993).

Active management's efficacy is conditional. Alpha is zero net supply, such that if some active managers have the potential to generate positive alpha by beating the market, other market participants must be potential "sources" of alpha who lag the market (as aggregate excess return must be zero). Then, what really matters is variation among market participants in their insights and implementation abilities, as relative performance depends on investors' relative, not absolute skill. Therefore, while most active funds trail their benchmarks in highly liquid, large-cap developed markets (Morningstar, 2025), the more relevant question for an allocator is whether the conditions for skilled, repeatable alpha generation still exist. We believe they do. Structural changes in markets have expanded the opportunity set for managers equipped with the right tools and resources, by shaping where and how alpha can be captured, driven at least by these three forces: the rise of pure passive investing, the rise of retail participation, and the dispersion of market characteristics across regions.

WHY PURE PASSIVE IS NOT NEUTRAL

Over the past decade, asset flows in most developed markets have shifted into passive or index-tracking investments, lured by the potential for lower costs and more predictable performance,

leading to a growing share of passive company ownership around the world. From the start of 2015 through December 2025, cumulative flows into US passive mutual funds and ETFs have reached \$3.5 trillion, while slightly more (\$3.6 trillion) has flowed out of active equity funds. Moreover, the passive ownership of the S&P 500 grew to 24% by September 2025, up from less than 10% in 2000 (Goldman Sachs Global Investment Research, 2025). At this scale, passive capital drives short-term price formation rather than merely tracking it, as flows impact price fluctuations in inelastic markets (Gabaix and Koijen, 2021; Bouchaud, 2022). Because passive capital moves mechanically and indifferently to fundamentals, it creates structural, exploitable dislocations.

The most immediate issue is concentration. Market-capitalization weighted indices direct the largest allocations toward the biggest stocks, by construction. Technology giants now account for 39% of the S&P 500 (S&P Dow Jones Indices, 2026) by market capitalization – the highest single-decile concentration since

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the early 1970s. At the global level, the top ten constituents of the MSCI ACWI exceed 25% (MSCI, 2026) of the index. Investors holding these benchmarks are not diversified; they unintentionally hold highly concentrated positions by default. Furthermore, market-cap weighting carries embedded biases: a systematic tendency to overweight overvalued stocks as prices rise, elevated exposure to high-volatility names at cyclical peaks, and the mechanical amplification of momentum (Ghayur, Heaney, and Platt, 2019). These are active risks, embedded invisibly and without discretion.

Passive flows also create predictable dislocations at index reconstitution, as when stocks are added to or removed from major indices, passive funds must trade in size regardless of valuation. These dislocations are documented by Li (2021), noting a distinct buy-high sell-low pattern driven by mechanical rebalancing on the reconstitution day at the closing price. Notably, Li finds that for index additions, stock prices rise by an average of 67 basis points (bps) during the 5 days prior to the index rebalance date (Day 0), and following the rebalance, a price reversal of 20 bps occurs over the next 20 days, leaving a net permanent price impact of 47 bps. As such, index-tracking flows temporarily push prices away from fundamental value in a predictable manner, which can allow active managers to position selectively ahead of the crowded buying pressure and subsequent reversion.

THE RISE OF RETAIL

The equity market structure has changed substantially over the past thirty years. Alongside traditional institutional investors and passive vehicles, retail participation in US equity trading volumes has doubled since 2010, rising to over 20% by 2025 (Goldman Sachs Asset Management and Bloomberg, 2025). A similar trend is visible across European markets, with countries including Germany, Spain, Switzerland, and the UK showing meaningfully elevated retail volumes.

The significance of this shift lies not only in the size of retail participation, but also in its nature. Retail investors do not, in aggregate, behave as rational price-setters. Academic research documents a consistent retail preference for stocks with lottery-

like characteristics – low share prices, high volatility, weak profitability, and limited institutional coverage (Kumar, 2009).

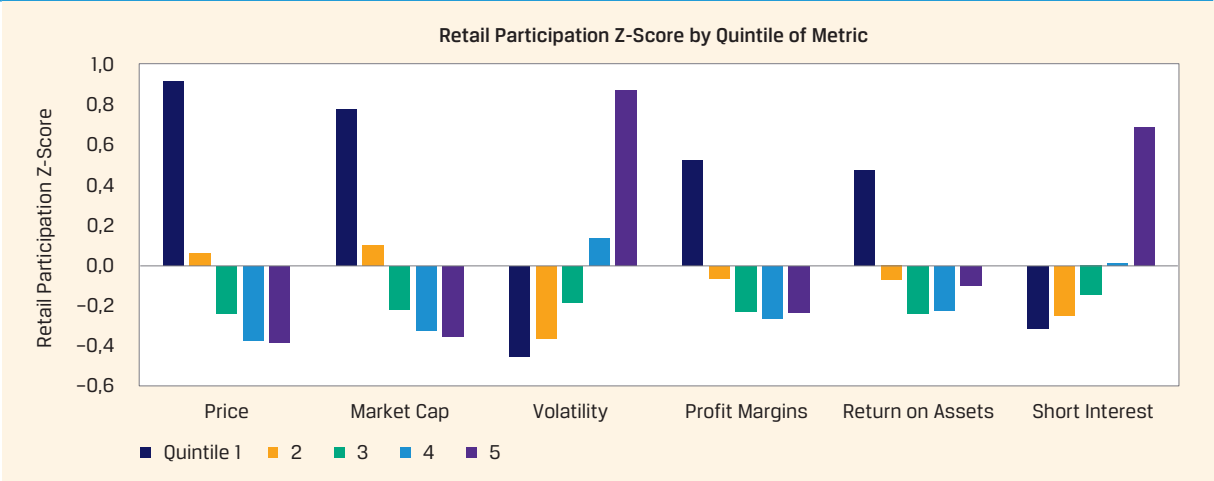
Figure 1 examines this empirically using daily US equity total market data from January 2020 to July 2025. We calculate a daily retail participation z-score (the number of standard deviations by which the stock’s retail flow exceeds the cross-sectional mean among all other stocks on that date) for every stock across equal-sized quintiles of key metrics (price, market capitalization, volatility, profit margins, return on assets, and short interest). For each quintile, the chart plots the average retail participation z-score across dates (Goldman Sachs Asset Management, 2025a).

We observe that retail participation increases monotonically as price, market capitalization, profitability, and return on assets fall, and as volatility and short interest rise. For example, stocks in the bottom quintile of market capitalization show average retail participation z-scores of approximately 0.78 standard deviations above the mean, compared to 0.35 standard deviations below the mean for the top quintile. Similarly, the most volatile quintile exhibits a z-score of 0.87 standard deviations above the mean compared to 0.46 standard deviations below the mean for the least volatile quintile. This concentration of retail flow in specific, speculative segments creates significant, localized price dislocations.

Considering all six metrics, the retail trading pattern is consistent with the preferences documented by Kumar (2009): retail investors are disproportionately drawn to smaller, less profitable, and more heavily shorted stocks – the same characteristics associated with lottery-like return distributions. For our purposes, it establishes that retail flow is not uniformly distributed across the market but concentrated in identifiable segments where its price impact is likely to be greatest.

Consistent with the crowded nature of these trading patterns, we expect these flows to drive positive price pressure from retail buys and negative price pressure from retail sells in the respective market segments where they take place in the short term.

Figure 1
Retail Participation
Z-Score by Quintile
of Metric



However, given the nature of these trades tend to be price insensitive and disconnected from fundamental characteristics, we expect that in the medium to long term, institutional trading drives prices back to fair value in reasserting fundamental value.

Performance data supports this. Figures 2 and 3 plot the cumulative long-only returns (gross of fees) of actively managed mutual funds and equity hedge funds from January 2020 to July 2025, considering stocks within the US total equity market universe, segmented by high and low retail participation. We first rank each stock every day by the number of shares traded by retail/total volume based on internal data processing to define high retail participation as the group of stocks within the top quartile of retail flow for every daily observation, and low retail participation as stocks in the bottom quartile of retail flow (Goldman Sachs Asset Management, 2025b). Then for each segment of stocks, we compute the performance of a hypothetical long/short portfolio tracking mutual fund net buys in figure 2, and hedge fund net buys in figure 3 based on proprietary data. The plotted performance thus represents that of a portfolio composed of the stocks that mutual funds or hedge funds have, on net, bought over a given time frame, serving as a proxy for the respective institutional investors’ long performance. With this, we observe that long performance of both fund types has been significantly superior among stocks with high retail participation, suggesting that sophisticated investors successfully exploit the aforementioned slow-enough-to-correct retail dislocations.

A case study from early 2025 highlights these dynamics. Following the April 2025 “Liberation Day” tariff announcement, retail investors bought the dip in European equities before reverting to net selling, while institutional investors steadily reduced risk. Net flows between the two groups were –74.5% correlated over the January to October 2025 period, illustrating a clear informational and behavioral divide.

INVESTING GLOBALLY: FRAGMENTED AND HETEROGENEOUS MARKETS

The active alpha opportunity set is highly distinct across regions, even among developed markets. While US large-cap equities are deeply researched and inefficiency sources may mainly rely on dislocations like the ones outlined above, international markets like Europe and Japan feature distinct dynamics with a broader alpha opportunity set: wider breadth, thinner coverage, asymmetrical information distribution, and heterogeneous investor behavior, leading to slower price discovery. This calls for differentiated strategies across regions.

EUROPE: FRAGMENTATION AS AN OPPORTUNITY

Europe’s diverse, fragmented, and complex equity market structure leads to slower price discovery and persistent pricing anomalies. It operates across more than 50 countries, 24 official languages, more than 20 stock exchanges (World Federation of Exchanges, 2024), and corporate tax rates ranging from 9% to 35% (Tax Foundation Europe, 2024) – a structural fragmentation that complicates information flow. Analyst coverage in Europe averages 24 analysts per stock on a market-cap weighted basis, compared to 43 in the US (Bloomberg, MSCI and Goldman Sachs Asset Management, 2026). Furthermore, only 58% of European equities are domestically owned, compared to 82% in the US (Goldman Sachs Global Investment Research, 2025). Foreign capital is often deployed through index-driven mandates or macroeconomic signals, whereas domestic investors leverage local-language access and regulatory familiarity. These divergent objectives, time horizons, and information sets create persistent disconnections in flow directionality that active managers might be able to exploit.

This environment causes information to diffuse slowly, allowing pricing anomalies to persist for longer. For one, momentum-based factors have historically delivered better performance and

Figure 2
Mutual Fund Long Returns by Retail Participation

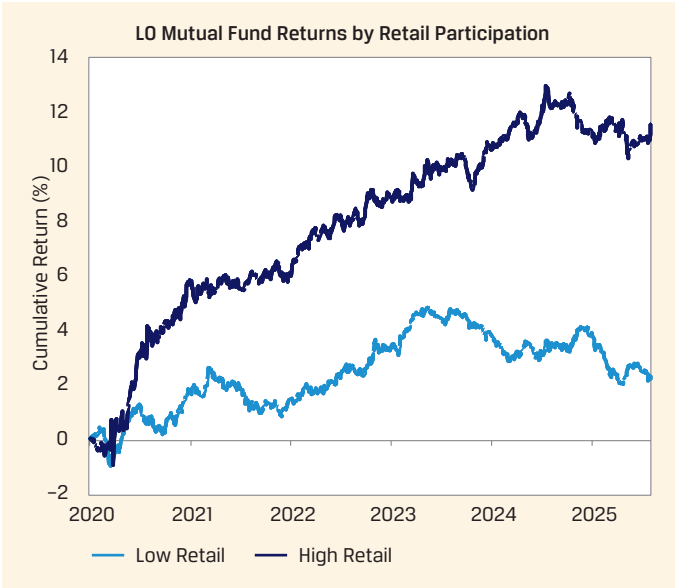
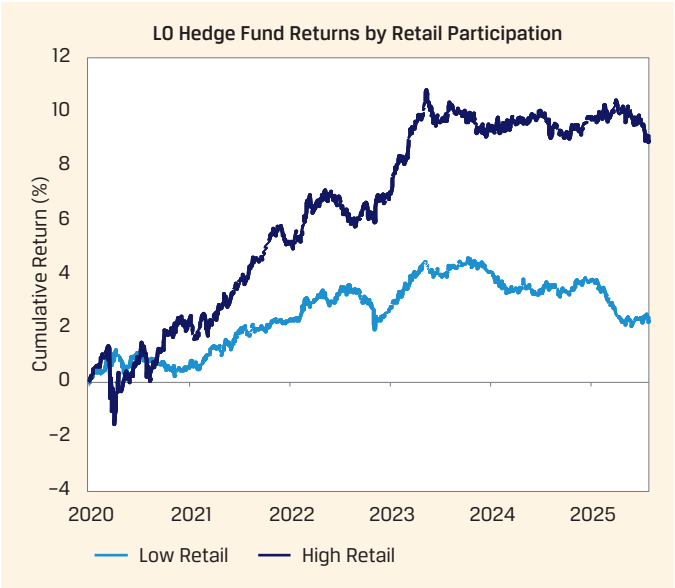


Figure 3
Hedge Fund Long Returns by Retail Participation



higher persistence in Europe. The market’s reaction to earnings calls further exemplifies this: European investors exhibit a greater trading volume spike around earnings announcements than US investors (2.86x vs. 2.42x of the 60-day median volume), indicating higher informational dependency on formal reports, while the impact of sell-side analyst revisions decays much more slower in Europe – after 63 days, the excess returns attributable to EPS revisions remain at 73% of their initial 5-day impact in Europe, compared to just 28% in the US (Goldman Sachs Asset Management, 2025c). This slower price discovery offers a temporal advantage to systematic managers.

This structural advantage is reflected in manager performance: over the ten years to June 2025, 69% of active European equity managers achieved positive excess returns versus their benchmarks (averaging +0.82% gross of fees), compared to only 42% of active US large-cap managers (averaging –0.41%) (MSCI, Goldman Sachs Asset Management, and eVestment, 2025).

JAPAN: CONTRARIAN DYNAMICS AND INFORMATION ASYMMETRY

Japan is structurally homogeneous (with a single exchange, language, and unified regulatory framework) but informationally asymmetric and contrarian. Its contrarian character is evident in factor dynamics: relative valuation signals based on price-to-book ratios have historically delivered more resilient and persistent returns in Japan than in any other major developed market, recently further reinforced by the Tokyo Stock Exchange’s corporate governance reforms encouraging capital efficiency. Analyst coverage is remarkably sparse: the median number of analysts per stock is 24 in the S&P 500 and 19 in the MSCI Europe, but drops to 1 for the TOPIX, where 41% of constituents have zero coverage (Figure 4), with a stark skew towards the largest stocks (Bloomberg and Goldman Sachs Asset Management, 2026).

Language remains a major barrier: only 57% of Japanese earnings reports in 2025 were available in English, falling even lower for mid- and small-cap firms, creating important inaccessibility for global capital without dedicated Japanese-language processing

capabilities. Additionally, foreign institutional investors (who drive over 54% of trading volume) often exhibit momentum-oriented behavior, while domestic institutions trade in a contrarian fashion (Japan Exchange Group, 2025). This friction produces complex, multi-layered price dynamics that may challenge traditional fundamental analysis but favor systematic, data-driven approaches.

SHIFTING RETURN DRIVERS: THE WEAKENING LINK BETWEEN FUNDAMENTALS AND SHORT-TERM PRICES

In our view, compounding market evolutions have made asset prices increasingly reactive to short-term dynamics rather than long-term fundamentals. This structural shift is evidenced by Figure 5, showcasing a severe decline in the explanatory power (R^2) of current reported earnings for subsequent stock price movements, which has nearly halved since 2010, which we believe supports the idea that investors, when setting stock prices, have come to rely less on current reported earnings compared to other information released concurrently with earnings. The sample for this analysis comprises all companies in the Russell 1000 index universe from 1Q2010 to 4Q2025 (64 quarterly observations). The earnings-specific metric plotted is the R-squared from a series of quarterly cross-sectional regressions of stocks’ earnings announcement window excess return (where for each stock, the announcement window is the day before and the day of the earnings announcement, days –1 and 0) on stocks’ earnings surprise (defined as the difference between actual and forecasted earnings scaled by the stock’s price). As the metric is subject to statistical “noise” in any given quarter, the results presented in the exhibit are smoothed over rolling 20-quarter periods. Thus, each point on the curve represents the trailing 20-quarter mean of the corresponding statistic (Goldman Sachs Asset Management, FTSE Russell, IBES, 2025).

This decline demonstrates that the relevance of reported earnings in explaining cross-sectional stock price variation has degraded substantially over the past years. Consequently, traditional financial data must be increasingly supplemented with nuanced, forward-looking indicators and a deep understanding of the non-fundamental forces shaping prices.

Figure 4
Analyst Coverage in Japan Spans Only a Fraction of the Market unlike in Other Developed Market Peers

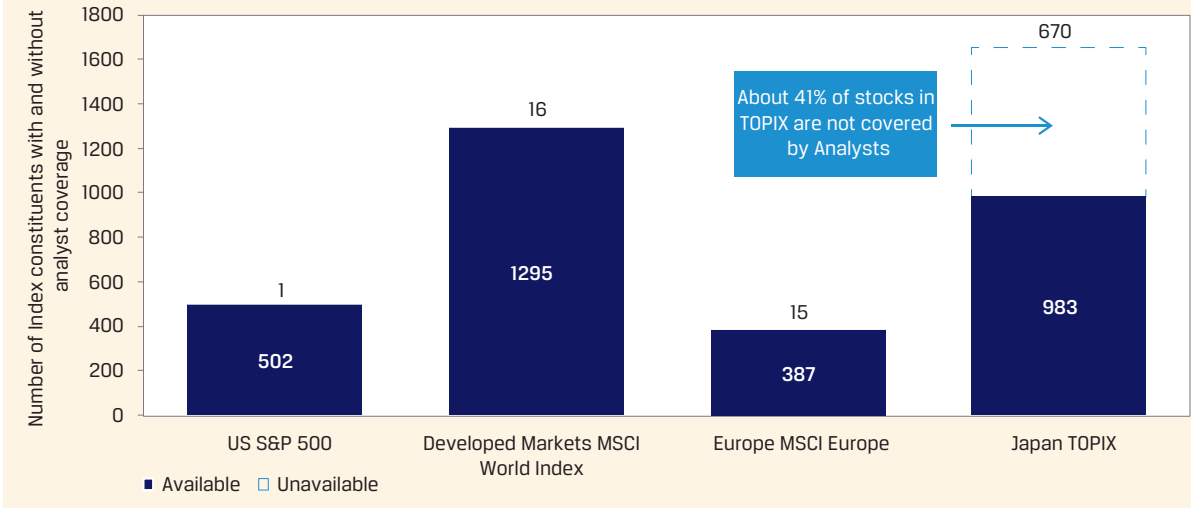
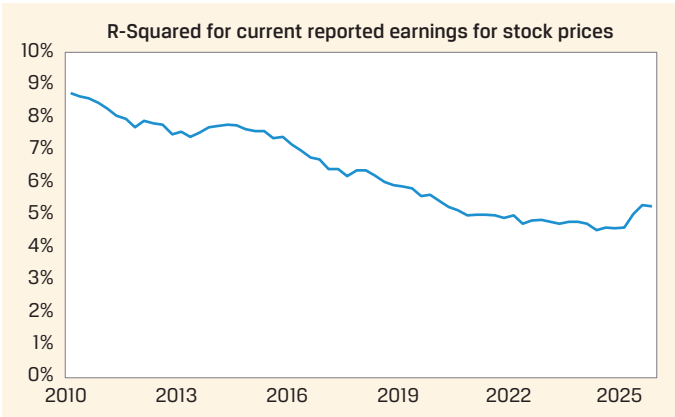


Figure 5
R-Squared for current reported earnings for stock prices



As inefficiencies multiply across participant types, geographies, and data dimensions, the tools for capturing alpha must evolve. Quantitative approaches are uniquely suited to this high-dimensional environment because the scale, speed, and dimensionality of the current informational landscape now exceed the limits of unaided human cognition.

UNSTRUCTURED DATA, BOUNDED RATIONALITY AND AI: THE NEW INFORMATIONAL FRONTIER

While the explosion of unstructured data (news, patents, earnings transcripts, audio, web-traffic) offers a richer information set, it also dramatically increases market noise, exposing the limits of human cognitive processing, as deeply researched in literature. Simon (1955) evidenced the psychological and physiological limits of the human brain that prevent human decision-makers from acting as the classical “economic man” with perfect information and infinite computational capacity. Moreover, Hwang and Lin (1999) empirically documented an inverted U-curve in decision quality, demonstrating that both information diversity and density independently and adversely impact decision quality once they cross a cognitive threshold.

Today’s complex data landscape represents an explosion in both diversity (via unstructured alternative data) and density (via sheer volume), worsening the decision quality of traditional, human-centric investment processes, such that systematic data-driven managers are best positioned to navigate this ecosystem. A systematic process can evaluate thousands of securities simultaneously, fusing traditional data with unstructured alternative sources, free from anchoring biases, emotional drift, and attention limits, and doing so with speed and scale. Notably, quantitative managers may also have the ability to address regional inefficiencies at scale. For example, in Europe, overcoming informational sparsity and complex, fragmented relationships across low-coverage stocks by systematically consolidating data into a unified, actionable picture; and in Japan overcoming linguistic barriers by processing Japanese-language filings, disclosures, and patent data at a scale that is physically infeasible for traditional international allocators.

Notably, even among data-driven managers, we believe that beyond access to raw information alone, the edge increasingly lies in ability of interpretation, judgment and implementation. Despite the theoretical availability of alternative data, a significant execution gap remains: over 80% of institutional buy-side investors are still looking to increase their use of alternative data (Exabel, 2026). Because raw data requires complex cleaning, standardization, and integration, the true active edge has migrated from simple data access to superior interpretation and implementation.

Artificial Intelligence (AI) plays a dual, tension-filled role in modern active management. On one hand, AI serves as a mechanism to relax the limitations of bounded rationality. By automating the gathering, synthesis, and analysis of vast quantities of unstructured data, it significantly lowers the cost of processing high-value information. In this capacity, AI acts as an analytical amplifier, expanding the cognitive boundaries of human decision-makers. On the other hand, the mass adoption of generative AI introduces a new source of market noise. By lowering the barrier to generating and consuming low-value, derivative data – such as machine-generated commentary, redundant signals, and insufficiently grounded outputs – AI dramatically increases both the diversity and density of the informational landscape. Consequently, AI accelerates the traversal of the information curve documented by Hwang and Lin (1999) in both directions. While it reduces the cost of processing high-value data, it equally lowers the barrier to generating low-value, derivative noise that contains little independent information, ultimately threatening to degrade decision quality.

Three critical considerations emerge for active managers:

- 1. Alpha Migration: As identical AI tools may be increasingly deployed on the same public datasets, alpha shifts from data access to proprietary differentiation and interpretive discipline.
- 2. Model Reliability and Biases: Large language models (LLMs) can generate inaccurate or insufficiently grounded conclusions, as well as misclassify domain-specific financial terminology, introducing systematic biases into quantitative signals.
- 3. Amplified Behavioral Crowding: Structural inefficiencies – such as retail dislocations from price-insensitive trading (Kumar, 2009) and mandate-driven passive index reconstitutions – remain highly persistent. If widespread AI adoption leads market participants to utilize similar models with converging outputs, retail and institutional crowding into identical trades may actually be amplified.

Consequently, the binding constraint on active managers could be interpreted as having shifted from Simon’s (1955) original focus on cognitive capacity to interpretive discipline: the judgment to determine which data are worth acquiring, which models are worth trusting, and which outputs are worth acting on.

SOURCING DATA-DRIVEN ALPHA: HYPOTHESES AND ADVANCED TECHNIQUES

Sourcing alpha from the market dislocations generated by passive and retail flows requires a systematic framework for decoding participant behavior. We believe the key lies in formulating informed hypotheses regarding how different market actors impact price dynamics and then executing on those insights in a disciplined manner. Sophisticated quant managers recognize that not all trading activity carries the same informational content.

For instance, aggressive trades by institutional investors may be considered more “informed” than retail, with directional patterns that carry genuine predictive signals for future returns. Domestic investors may be assumed an informational edge over international allocators, who may face language barriers and less granular access to local market data. Passive ETF reconstitutions, by contrast, could be considered fundamentally “uninformed” flows; however, investors should recognize that these events generate temporary price impacts as massive volumes of mechanistic, index-tracking trades push stocks away from fair value – dislocations that tend to revert over time and can be profitably captured. This pattern closely mirrors what occurs with retail investor behavior. Even simple breadth-of-ownership signals, such as tracking whether more funds are net buyers than sellers of a given stock regardless of volume, have been shown to positively predict near-term returns (Chen, Hong and Stein, 2002). The more sophisticated quant managers weave these disparate participant-level insights into a unified, continuously updated view of market microstructure that enables the dynamism required to navigate today’s inefficiencies.

To translate these insights into portfolio alpha, quantitative firms may need to deploy an arsenal of machine learning techniques and alternative data across several interconnected dimensions, focusing on two key components. First, inferring sentiment across various market participants (including buy-side positioning, sell-side analyst tone, management language on earnings calls, and broader market attention) by utilizing NLP and transformer-based models to extract nuanced signals from vast quantities of unstructured text and audio data. Second, analyzing flow data to detect distinct trading patterns among different investor types, allowing them to capture the dislocation reversal opportunities stemming from retail herding behavior or the predictable pressures of passive ETF reconstitutions. By combining sentiment analysis, participant-level trade inference and flow scrutiny within a disciplined, technology-powered framework, we believe skilled quant managers are well-positioned to dynamically navigate an increasingly fragmented and complex alpha landscape.

CONCLUSION

The empirical and structural realities of modern equity markets challenge the conventional wisdom that active management is a relic of a bygone, less efficient era. Markets are not becoming simpler or more efficient. Instead, they are increasingly complex: markedly fragmented, highly reactive to short-term behavioral flows, and heavily influenced by heterogeneous participant types

with divergent incentives. The rise of valuation-indifferent passive capital, the expansion of speculative retail participation, and the diverse persistent structural frictions across regions like Europe and Japan collectively mark persistent structural inefficiencies in global equity markets, widening the gap between short-term asset prices and long-term fundamental values.

We believe these inefficiencies are structural and persistent. Retail participation remains a permanent market feature, passive capital continues to generate scale-proportional dislocations, and regional complexities in Europe and Japan demand specialized approaches beyond the reach of single, human-led frameworks. However, because markets continuously evolve, consistent active success requires managers to dynamically adapt their strategies, leveraging the expanding data and technology landscape, including AI, as tools for proprietary differentiation rather than crowded replication.

For allocators, the traditional binary choice between active and passive investing is a false dichotomy. Pure passive investing is itself an active allocation decision, one that implicitly accepts extreme index concentration, unmonitored factor biases, and drives predictable reconstitution-driven dislocations that active investors may profit from. While the market dynamics shaping a new alpha landscape may not reward the average active manager, the more productive inquiry is not whether the average active manager can outperform, but whether the right conditions are in place for relatively more skilled managers with the right resources, tools and processes to capitalize on inefficiencies.

While the market dislocations outlined can overwhelm the bounded rationality of traditional, human-centric investment processes, they present a structural and repeatable opportunity set for systematic, data-driven active managers. Equipped with advanced quantitative frameworks, natural language processing, and interpretive discipline, systematic managers are uniquely positioned to scale across geographies, filter out high-dimensional noise, and capture the predictable price reversions left in the wake of passive and retail flows. Ultimately, as market structures continue to evolve, we believe the active edge belongs to those who can systematically translate complex, unstructured data into disciplined, dynamic portfolio execution.

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