Vanguard

ACTIVE EDGE

Winning the zero-sum game

Matthew J. Piro, CFA
Global Head of Oversight and Manager Search
Vanguard Portfolio Review Department

Andrew M. Shuman, CFA
Senior Investment Director
Vanguard Portfolio Review Department

Vanguard's active equity funds have delivered consistent outperformance for investors

Vanguard's approach to actively managed equity funds

- Vanguard has a long and successful history of offering actively managed equity funds. On an asset-weighted basis globally, our active equity funds have delivered more than 60 basis points of annualised excess return over their stated benchmarks for the 10, 15 and 20 years ending 31 December 2023*.
- Our approach to manager selection centres on what we believe to be the key drivers of success—firm, people, philosophy and process—and the resulting outcomes of portfolio and performance. In this paper, we delve into greater detail on what we look for—and why—within each of these drivers.
- In our view, the active managers best positioned for success are those that are client-centric, have talented teams with diverse perspectives and long-term approaches focused on deep, differentiated research and true stock picking, and not reliant on static factor bets.

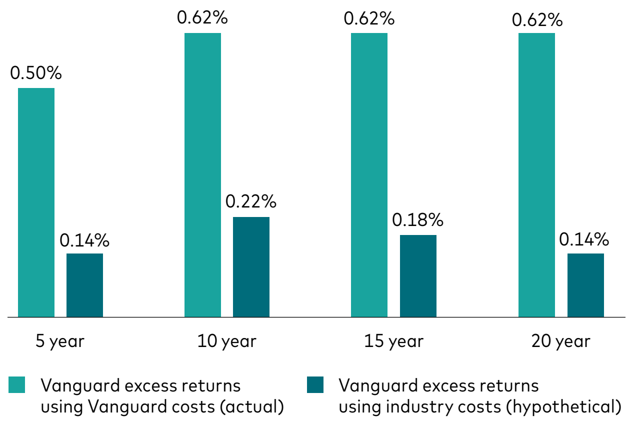
Globally, Vanguard's actively managed equity funds have delivered substantial net outperformance on an asset-weighted basis over long time periods. In contrast, the broader industry has exhibited flat or negative net excess returns—consistent with the "zero-sum game" nature of the financial markets, where the average active manager may match their benchmark before fees but lag on a net basis because of operating and trading costs.

*** Please refer to Figure 1 for more detailed information.**

Vanguard's active edge (**Figure 1**) stems from both our funds' cost advantage—roughly 40 basis points (bps) cheaper on an asset-weighted basis than the industry average in the US (our UK funds are also cheaper than the peer average in the UK with most falling in the bottom quartile of fees verses their IA and Morningstar averages)—and our manager selection process.

FIGURE 1
Skilled managers and low costs drive our active edge

Vanguard US-domiciled actively managed equity strategies' asset-weighted excess returns versus industry



Notes: Excess return is the difference between a fund's NAV total return and the total return of its benchmark index. Results for other time periods will vary. **Note that the competitive performance data shown represent past performance, which is not a guarantee of future results, and that all investments are subject to risks. For the most recent performance, visit our website at https://www.vanguard.co.uk/professional/product.** The performance of each US-domiciled Vanguard and non-Vanguard strategy in the Morningstar database was compared with that of its stated benchmark using monthly return data ended 31 December 2023. The monthly returns for all Vanguard active equity funds, including those that were merged or liquidated during the period, were included in the performance calculations. The active equity portions of Vanguard balanced funds were excluded. Annualised asset-weighted excess returns were generated by calculating the asset-weighted cross-section monthly returns and then generating a time series set of returns. All strategy performance data are net of fees, in USD. Cost advantage is measured as the asset-weighted expense ratio differential between Vanguard and non-Vanguard equity strategies used in the analysis. The relative skill, talent and luck are the residual return differentials. Vanguard strategies and industry costs are hypothetical.

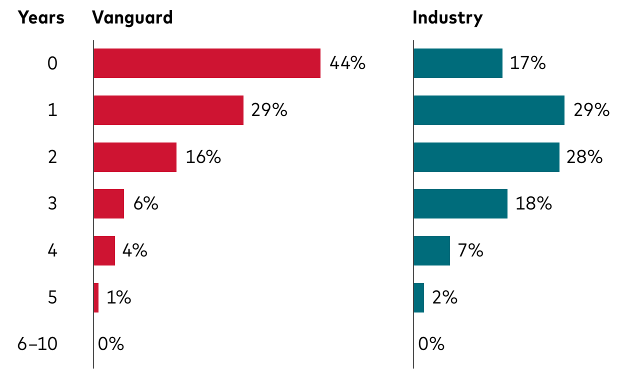
Sources: Vanguard and Morningstar, Inc., as at 31 December 2023.

Learn more about our active funds

Consistency has been the hallmark of our approach. Our outperforming strategies have rarely fallen into the bottom quartile in any given year relative to peers, while competing funds have tended to be more volatile, making investors more likely to exit the fund at the wrong time (**Figure 2**).

FIGURE 2
Most successful US-domiciled actively managed equity strategies experience bottom-quartile performance

Number of years that outperforming Vanguard and non-Vanguard active equity strategies appear in the bottom performance quartile (1994–2023)



Notes: We evaluated all US-domiciled, nine-style-box US active equity strategy, emerging markets and developed market funds with a minimum of 10 years of performance data over the period from 1 January 1994, to 31 December 2023, relative to their style benchmark, and identified all net outperforming strategies. For each group, we calculated overlapping one-year performance for each year of the period and measured it relative to the relevant 25th-percentile peer returns over the same period. The data presented are the years of underperformance over each 10 year time period. **Note that the competitive performance data shown represent past performance, which is not a guarantee of future results, and that all investments are subject to risks. For the most recent performance, visit our website at https://www.vanguard.co.uk/professional/product.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

Key takeaways

Firm

We seek fund management firms whose incentives are clearly aligned with the long-term interests of their clients in generating excellent performance, not gathering assets. They should have the resources, brand and culture needed to attract and retain a deep pool of top talent.

People

The rise of index investing has coincided with the increased calibre of active management professionals, resulting in a highly-talented, in-demand pool of talent. In today's hypercompetitive markets, we strive to partner with the most impressive teams we can find in terms of not only academic credentials but also diversity of background and thought.

Philosophy

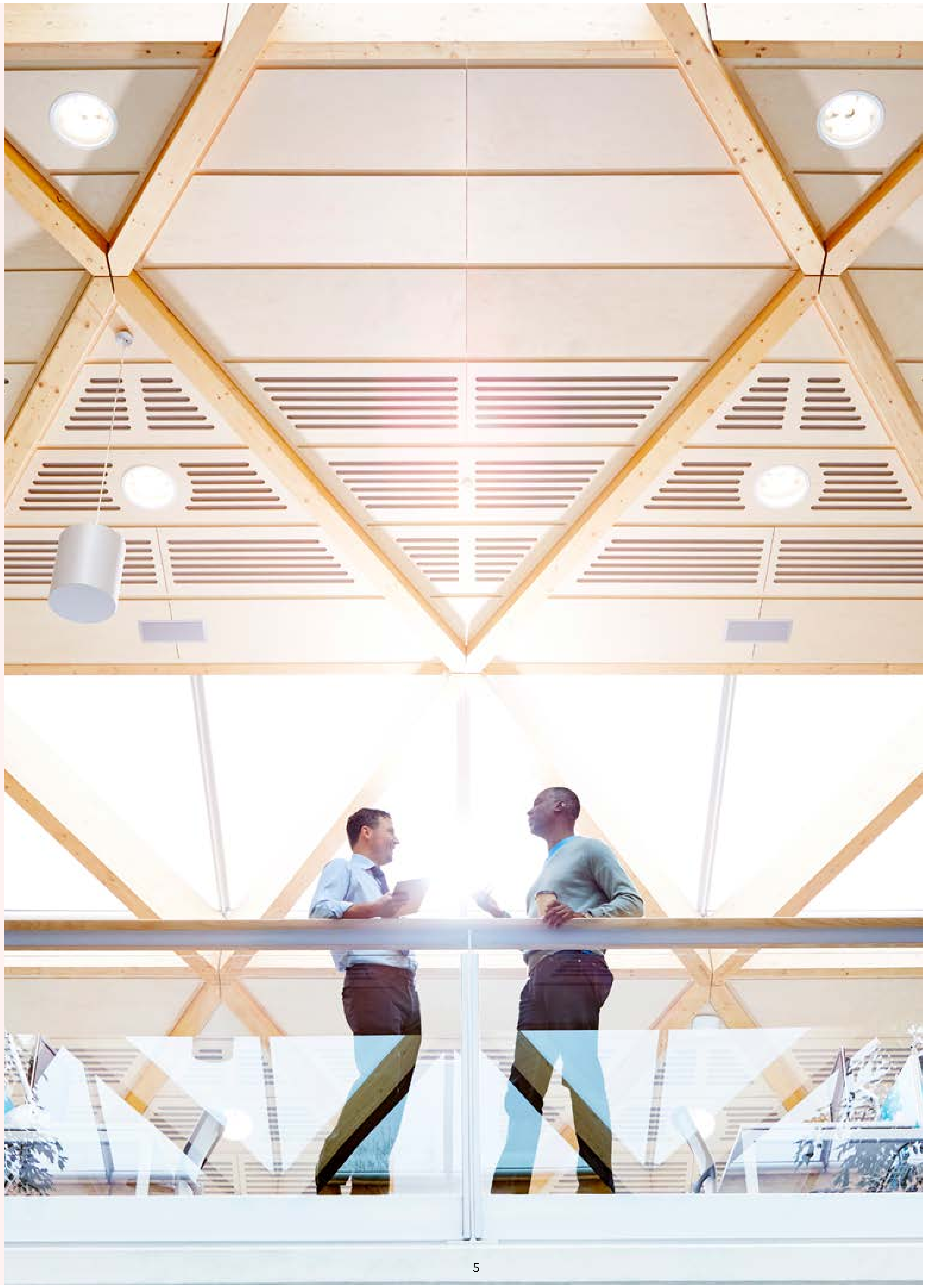
Research supports the efficacy of our lower-turnover, longer-term approaches, as well as the merits of strategies with a distinctly contrarian footprint or that are difficult to "factorise." This will only become more important with the proliferation of smart beta ETFs that offer low-cost, transparent exposure to systematic sources of excess return, such as value and quality.

Process

Increased competition and shifts in the nature of the economy have made it difficult to outperform using simple headline financial metrics such as book value or reported earnings per share (EPS). We believe that proprietary, in-depth research, whether focused on individual stock selection or unique factors for quantitative managers, can continue to add alpha.

Performance

While we have yet to find a single metric that will perfectly predict success, we aim to tip the odds in our favour by focusing on the long term, using the right benchmark, adjusting for risk and leveraging customised performance attribution approaches that better distinguish between luck and skill.



Firm

While investing is a people business, firms are the economic units that attract, motivate and retain talented investors.

Vested interest

A range of ownership structures can be effective in this regard, though employee ownership tends to correlate with better firm profitability and growth[1]. Just as we seek to evaluate our managers' results over longer time periods—and often structure their incentive fees on a three- or five-year basis—we prefer that firms do so internally as well.

Behemoth or boutique?

We're often asked, which are superior—larger firms, with a broader range of capabilities across asset classes and geographies, or smaller boutique firms, with a specialised focus on a narrower range of strategies?

Our answer is both. We have mandates with large institutional firms, such as Wellington, Baillie Gifford and Schroders, as well as smaller boutiques, such as Pzena.

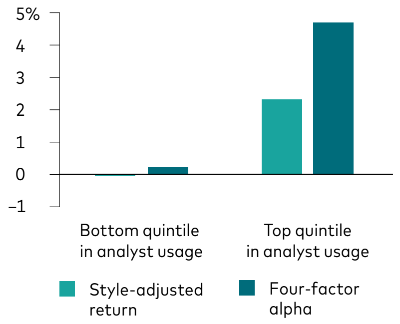
For large firms, the quality of their central research resources is a key distinguishing factor.

According to Cici et al. (2016), it is also important that portfolio managers actually use these resources effectively; those who do so tend to fare better (**Figure 3**)[2]. The breadth and depth of a firm's analyst coverage can also be an advantage. A range of studies—including Bae et al. (2008) and Berry and Gamble (2013)—have found that local analysts have an information edge, particularly when it comes to more opaque markets or smaller-cap companies[3,4]. Similarly, Cici et al. (2015), found that large firms might have substantial trading infrastructure that both reduces costs and allows portfolio managers to hold less-liquid positions (**Figure 4**)[5].

Smaller boutiques may lack the resources of their larger institutional peers, but they have advantages as well. A boutique's investment team may have substantial direct equity in the firm, streamlined decision-making with less bureaucracy, distraction and entrepreneurial culture.

FIGURE 3

Higher reliance on analysts' ideas correlated with higher style-adjusted excess return and higher four-factor alpha



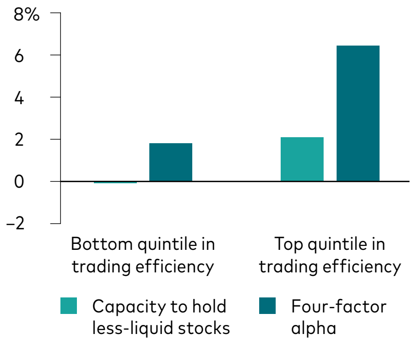
Notes: Figures are expressed as percentage per year.

Source: Vanguard illustration using data from Cici et al., 2016[6].

Past performance is not a reliable indicator of future results.

FIGURE 4

Trading efficiency translates to higher alpha and better ability to hold less-liquid stocks



Source: Vanguard illustration using data from Cici et al., 2015[7].

Past performance is not a reliable indicator of future results.

Who's next in line?

On the other hand, succession planning is a key risk for small boutique firms and often the main reason we've terminated managers over the years. In our experience, it's something managers have to think about early on - and not when a firm's founder or lead portfolio manager is nearing retirement. By then, it's too late to properly groom the next generation of talent or to seamlessly transfer ownership stakes.

CASE STUDY

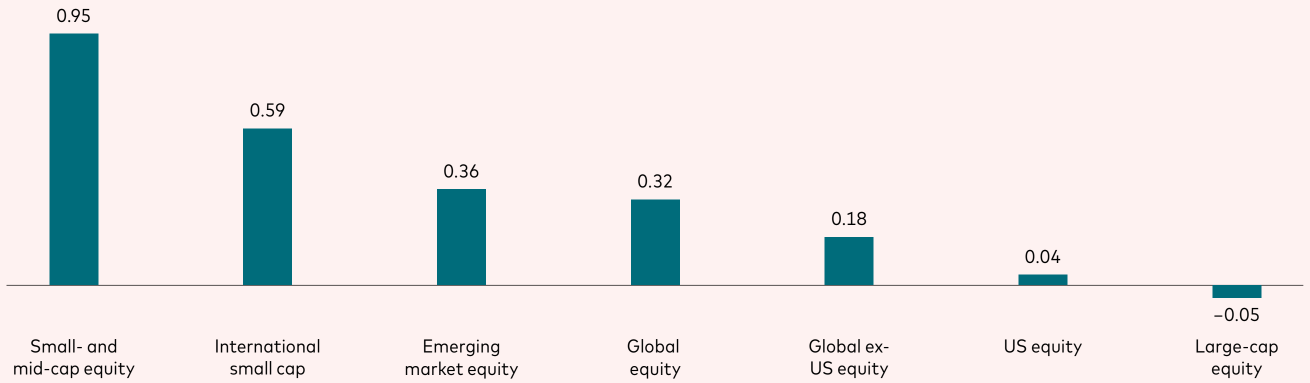
Wellington Management Company

Wellington Management Company is one of our largest external advisory partners, both by total assets under management and number of mandates. A major factor in our partnership is the breadth and depth of the firm's equity research resources, with more than 50 global industry analysts (GIAs) who are experts in their respective domains. Unlike at other firms, being a GIA is a career, and many are partners - a distinct aspect of Wellington's ownership structure and strong succession planning.

Every morning, hundreds of portfolio managers, GIAs and other investment professionals—connecting remotely from Wellington offices around the world—gather together to discuss timely investment ideas, many of which end up in Vanguard active funds. Wellington fosters healthy debate, diversity of thought and the free exchange of ideas - conditions that company management believes are essential for informed investment decision-making.

FIGURE 5

Wellington Management Company active equity approaches: average information ratio* over 10 years or since inception



Note: The chart compares Wellington's long-only strategies with the relevant benchmark index in USD.

Sources: Vanguard and Wellington, as at 30 June 2024. Gross of fees.

Past performance is not a reliable indicator of future results.

* Information ratio is a measure comparing the active return of an investment with a benchmark (usually an index) relative to the volatility of the active return. It is often used to gauge the consistency of returns over time.

People

Investing is a people business. In a zero-sum game, the "smart money" should outperform. Usually, it's also a "team sport". Our process for evaluating the calibre of the teams we encounter follows a simple equation:

Collective ability = individual ability + diversity

Background as a preliminary screen

The simplest way to quantify ability, in the absence of running managers through a battery of IQ tests, is by educational background. A few academic studies—including Li et al. (2011) and Gottesman and Morey (2006)—have shown this to be a reasonable starting point, as fund managers who attended better schools tend to perform better[8,9].

We emphasise that this should be no more than a starting point for evaluating an investment team on paper. First, the world is hardly a meritocracy; nepotism and structural barriers surely result in many unworthy students at top universities and brilliant ones elsewhere. Second, the professionalisation of the industry has rendered everyone's credentials impressive; it is common for investment professionals to have the CFA® certification or a top-tier MBA.

Diversity of thought

Our process, therefore, aims to go deeper, encompassing multiple engagements over time, with not just the named portfolio managers or firm leadership but also key members of the supporting analyst team. This gives us a better sense of team dynamics, the decision-making process and culture.

Team diversity is a critical dimension. Our view, supported by research conducted by Vanguard in 2022,[10] is that diversity leads to better decision-making, helps avoid group-think, drives creativity, helps break down language barriers and develops a better understanding of cultural nuances.

We take a holistic view of what constitutes diversity, incorporating both identity (gender, ethnic) and experience (background, education), which together should drive diversity of thought. Both are lacking in the broader industry.

> "To discover the best investment ideas, it's important to find people who aren't the same as you and don't think like you."
>
> **Will Sutcliffe**
> Partner and Head of Emerging Markets Team, Baillie Gifford

For example, according to Citywire's database of more than 17,500 portfolio managers globally, just 12% are women[11], and finance tends to attract certain personality types.

Measuring both aspects of diversity can be challenging but is nevertheless worth attempting. For diversity of experience, Tan and Sen (2016) and Baer et al. (2007) found that educational background is a useful and easy-to-obtain dimension that research directly correlates with better team performance[12,13]. Prior industry experience also has positive correlation with improved stock picking within that industry, according to Cici et al. (2018)[14], particularly in health care according to research by Kostovetsky and Ratushy in 2016 (**Figure 6**)[15].

Tan et al. (2016) found that higher educational diversity among mutual fund management teams is associated with higher monthly alpha

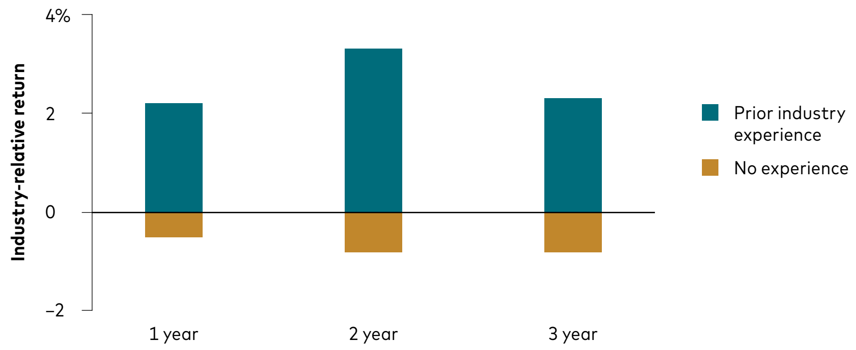
+44 bps with diversity of degree levels

+35 bps with diversity of undergraduate degree subject

The study quantified educational diversity based on degree level and field of study using the Gibbs entropy method and then ran a regression of Carhart four-factor alpha against team diversity measures and other control variables (such as fund size, fund family size, turnover rate and expense ratio.). The results suggest the amount of alpha that is associated with each "unit" increase in diversity. See cited source for more details.

Source: Tan et al., 2016[16].

FIGURE 6
Fund managers showed superior stock picking in industries where they previously worked



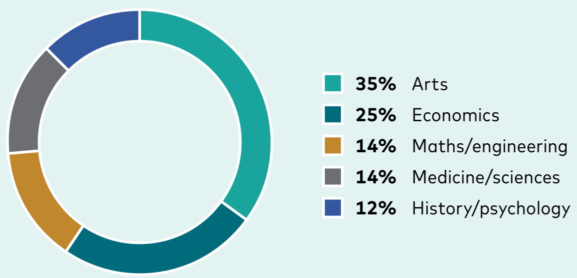
Source: Vanguard illustration using data from Cici et al., 2018[17].
Past performance is not a reliable indicator of future results.

CASE STUDY

Baillie Gifford

Baillie Gifford is our third-largest external advisor partner globally. We believe that the firm has made a deliberate effort to recruit from a diverse set of backgrounds rather than simply the traditional finance areas. This has led to investment teams that are impressively credentialled and cognitively diverse.

FIGURE 7
Investment professionals at Baillie Gifford come from a diverse set of academic backgrounds



Sources: Ballie Gifford, as at 31 December 2023.

Philosophy

One consequence of the explosion in computing power and democratisation of financial data is the difficulty of outperforming based upon predicting short-term data points such as quarterly earnings and analyst revisions.

Long-term focus

Both our own experience in selecting managers over decades and numerous academic studies—including Cremers (2017) and Lan et al. (2020)—suggest that fundamental active managers are better served by taking a long-term, low-turnover approach (**Figure 8**)[18,19].

There are two reasons for the superior performance of lower turnover strategies: firstly, and most directly, the lower trading costs, particularly for larger funds, and secondly, an ability to focus on factors that have very little bearing on near-term results but may be the main drivers of the future success of a company. These factors include industry dynamics, competitive advantages, environmental, social and governance (ESG) considerations, culture and intangible assets. When everyone else is hyperfocused on the near term, extrapolating recent trends or assuming mean reversion, skilled stock pickers can add alpha by getting the long-term trajectory right.

Going against the grain

Doing so requires truly proprietary research, not following the crowd or Wall Street. Research from Lan et al. (2020) and Kacperczyk and Seru (2004) has shown that fund managers who "herd" with their peers or follow sell-side ratings underperform those with a contrarian streak who buy when others are selling **(Figure 9)**[20,21]. We believe this concept applies equally to both value and growth managers. Those who bet on Amazon early on were very much cutting against the grain.

FIGURE 8

High active share* and low turnover correlated with higher alpha

(average factor-adjusted alpha in percentages)

Small-cap

		Active share	
		Low	High
Turnover	High	0.10	–1.15
	Low	–0.04	1.94

Large-cap

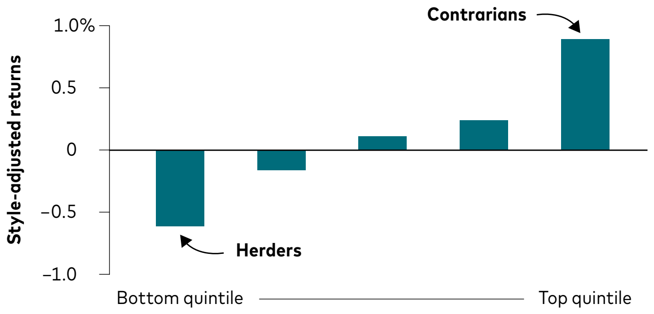
		Active share	
		Low	High
Turnover	High	–1.28	–0.05
	Low	–1.51	1.37

Notes: Highest and lowest quartiles for turnover and active share were used. See cited source for more details.

Source: Vanguard illustration using data from Cremers, 2017[22].

FIGURE 9

Funds with contrarian trading patterns relative to peers did better than those who followed the herd



Source: Vanguard illustration using data from Wei et al., 2014[23].

Past performance is not a reliable indicator of future results.

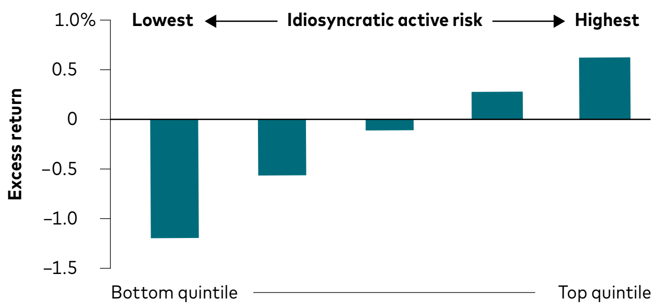
* Active share calculates how different a fund is from its benchmark by comparing the weightings of securities in a portfolio with those of its benchmark. The higher the active share, the more the fund differs from the benchmark. It is often used to measure the degree to which a portfolio is actively managed.

True stock picking over factor bets

Active share and tracking error are commonly used as measures of a fund manager's "activeness"—how much they deviate from their benchmark. In isolation, we find that both metrics can be misleading and heavily influenced by the choice of benchmark[24]. For instance, an easy way to create the impression of a highly active approach is to simply have a small-cap lower-turnover bias - not owning the largest constituents in the index will inflate active share and tracking error. This, however, is not true of fundamental active management worth paying a premium fee for. Research from Mitali (2019) has shown that it is not the level of tracking error that matters but rather the proportion of tracking error coming from stock-specific risk and not factor tilts (**Figure 10**)[25].

FIGURE 10

Funds with a higher proportion of tracking error coming from idiosyncratic risk (stock picking) did better than those that relied on timing or static factor tilts



Funds with a higher proportion of tracking error coming from idiosyncratic risk (i.e., stock picking) have generally outperformed those who relied more on timing or factor tilts.

Source: Vanguard illustration using data from Buffa et al., 2020[26].

Past performance is not a reliable indicator of future results.

Low turnover and true stock picking across Vanguard funds

Many of our most successful active funds and managers employ long-term, low-turnover approaches. We constantly stress test the long-term thesis our managers have for their holdings, ensuring that their research process was thorough and led to a differentiated view from other active managers or the consensus of sell-side analysts.

Additionally, we use sophisticated risk models to ensure that the tracking error our funds and managers take relative to their benchmarks stems from true bottom-up, idiosyncratic stock picking, not factor bets. Investors seeking static factor exposures— such as value, size and so on—are likely better suited with a lower-cost, more transparent passive factor or smart beta product.

Process

A compelling body of academic research indicates that the market tends to underappreciate information that is nuanced or complex and requires “looking under the hood” to properly calibrate. Active managers with the discipline and willingness to delve into the fine print and details buried in company disclosures have a real opportunity to add alpha.

Rigorous research over simple metrics

Much of this opportunity stems from the growing disconnect between the accounting rules that govern reported financial metrics and true value-creating activities in today’s modern economy. Under some accounting rules, intangible assets—such as research and development (R&D) or selling, general and administrative (SG&A) expenses—are treated as a one-time expense, distorting book value, reported earnings and profitability.

Research conducted by Lev (2018) and Lev and Srivastava (2019) found that a large R&D expenditure to develop new drugs, while crucial to the long-term cash flow of a pharmaceutical company, is expensed immediately, reducing EPS, and is not carried on the balance sheet at all, leading current earnings to be artificially depressed and the company to appear overvalued on a price-to-book (P/B) basis[27,28].

This dynamic has led reported earnings and book values to have less and less relevance for firm market values over time as the balance of the economy has shifted away from physical asset-intensive businesses (such as railways and, energy).

> “We invest in a world where companies can grow at unprecedented rates and at little marginal cost, where intangible assets such as intellectual property, networks and data are the main determinants of future cash flows.”
>
> **Baillie Gifford**

Firms with understated EPS outperformed those with overstated EPS

Top decile in core EPS minus stated EPS

16 bps **in monthly alpha**

Bottom decile in core EPS minus stated EPS

–50 bps **in monthly alpha**

Notes: The study divided firms into deciles based on their core EPS versus stated or reported EPS, in USD. The core EPS metric removes transitory impacts in reported EPS. Decile 1 companies’ reported EPS understates the sustainable EPS of the company, whereas decile 10 overstated earnings. Forward returns of each decile were tracked and adjusted for factor loadings. See cited source for more details.
Source: Derived from Rouen et al., 2019[29].
Past performance is not a reliable indicator of future results.

In addition, market participants appear to anchor too much to reported earnings as a guide to the sustainable profitability of a company, ignoring the myriad of one-time adjustments, often buried in the footnotes, that distort the figure. Researchers found that companies with the highest level of EPS-increasing adjustments—those with artificially high reported EPS— significantly underperformed.

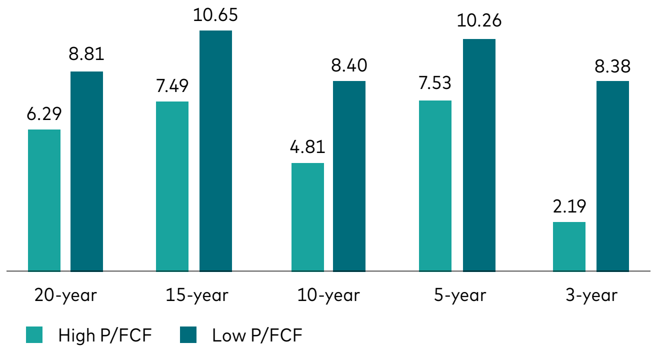
Depreciation assumptions can also distort a company’s earnings. When companies make investments, such as building a factory, the costs are deducted from earnings each year over the useful life of the asset. If depreciation is understated relative to the true replacement cost—failing to take into account inflation or technological advances over time—earnings will be overstated. Free cash flow (FCF), which simply uses operating cash flows less capital expenditures, can help avoid these distortions, although it has pitfalls of its own. Companies can appear to maintain current FCF by deferring capital expenditures that are necessary to sustain their production or grow the business or by relying upon stock-based rather than cash compensation to remunerate employees.

For example, companies with low price/earnings (P/E) ratios but high price/free cash flow (P/FCF) ratios have underperformed over time, as have companies that appear inexpensive based solely on their book value (P/B) (**Figure 11**).

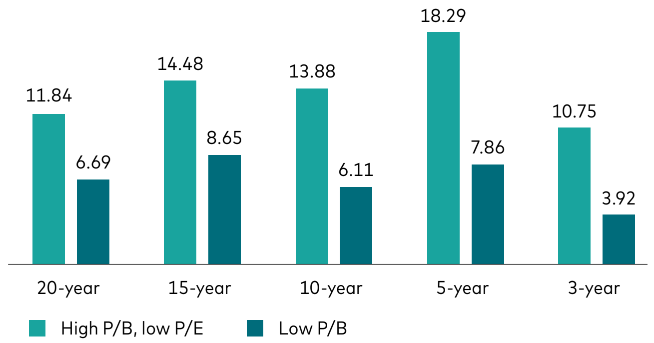
We look for active managers that understand the pitfalls of relying on off-the-shelf financial metrics and the distortions they might create in stock prices, which they can exploit by their deeper and more nuanced understanding of a company’s business model and financials.

FIGURE 11
Valuation: The devil is in the detail

Annualised returns within bottom half of P/E (%)



Stocks looking expensive on a P/B basis but inexpensive on a P/E (%) basis did better



Notes: MSCI All Country World in USD, groupings are rebalanced annually.
Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.
Source: Vanguard and FactSet, as at 30 June 2024.

Performance

Performance is arguably the most difficult factor to assess for active managers. While most investors recognise that there is a degree of luck involved, avoiding chasing short-term results is easier said than done.

Separating the signal from the noise

We approach this challenge culturally by constantly emphasising the long term. Even the best active managers will undergo stretches of poor relative results that could be five or even 10 years long. We also do this structurally through our iterative search and oversight process and quantitatively by filtering out as much noise from the data as we can. We aim to start with the right benchmark - a simple task in theory but one that many investors (and even managers) often get wrong. Clare and Clare (2019) found that this allows us to adjust excess returns for the amount of relative risk a manager takes—the information ratio—which tends to be a bit less noisy as a predictor of future results (**Figure 12**)[30].

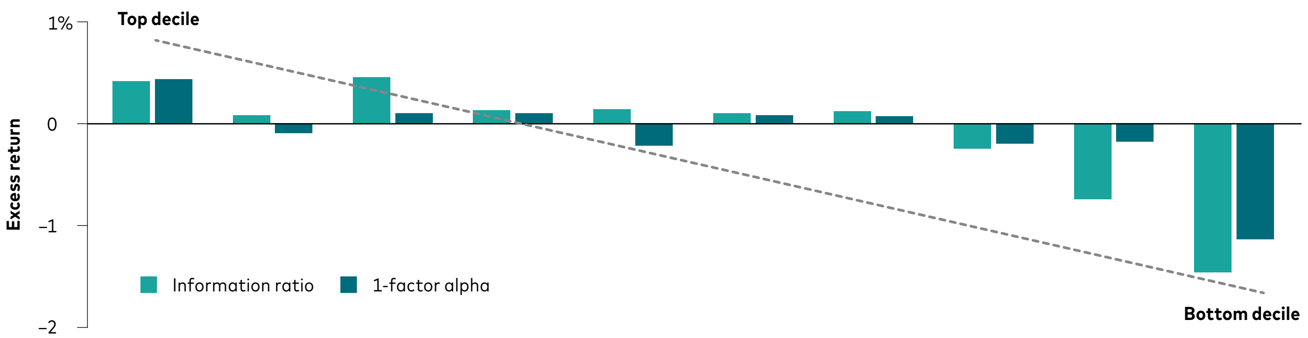
Thoughtfully constructed peer groups are also important. The key question we're seeking to answer is whether a manager delivered superior results to what an investor could have achieved in a comparable, lower-cost index fund or through a major competitor's offering.

Stock selection versus style biases

Managers can beat or lag their benchmarks considerably because of style or market-cap tilts that should not count as skill per se. Performance attribution aims to account for these biases. One approach is to use factor models, which some evidence suggests help predict future results, but these tend to be unintuitive "black boxes." We prefer to start with how a manager invests—what factors or characteristics they screen for or consistently focus on—and determine whether the manager has picked the winners from this pool of stocks (skill) or has simply been in the right place at the right time (luck).

FIGURE 12

Information ratio was a better performance predictor than past excess return



Source: Vanguard illustration using data from Clare and Clare, 2019[31].

Past performance is not a reliable indicator of future results.

Factor-adjusted alpha was a better predictor of performance than relative returns alone.

7-factor alpha	Return vs. peers	Return vs. market
1.08%	**–0.24%**	**–0.48%**

Regression analysis determined how predictive various trailing return metrics are at predicting peer relative return over the next three years. Figures above are the regression coefficient of the funds' forward three-year annualised performance relative to Morningstar peer group averages when parsed by the cited trailing three-year metric. The study used historical monthly total returns for all US open-ended, long-only active equity funds, including those that have liquidated or merged and have at least two years of return history during 1990 through to 2016. At least one of the A-share, no-load, and institutional share classes were included; the oldest share class was selected for funds with multiple share classes.

Past performance is no guarantee of future returns.

Source: Derived from Arnott et al., 2017[32].

Vanguard's approach to manager selection

Vanguard has a long track record in selecting active managers. In this paper, we outline what we look for in evaluating a manager's "active edge". We're confident our process can provide a framework that leads to long-term success for investors.

Endnotes

1 Ernest O'Boyle, Pankaj Patel and Erik Gonzalez-Mulé. "Employee Ownership and Firm Performance: A Meta-analysis," *Human Resource Management Journal* 26, no. 4 (2016): 425–448. https://doi.org/10.1111/1748-8583.12115

2 Gjergji Cici and Claire M. Rosenfeld. "A Study of Analyst-Run Mutual Funds: The Abilities and Roles of Buy-Side Analysts." *Journal of Empirical Finance* 36(C) (2016): 8–29. https://doi.org/10.1016/j.jempfin.2015.12.004

3 Kee-Hong Bae, René M. Stulz and Hongping Tan. "Do Local Analysts Know More? A Cross-Country Study of the Performance of Local Analysts and Foreign Analysts." *Journal of Financial Economics* 88, no. 3 (2008): 581–606. https://doi.org/10.1016/j.jfineco.2007.02.004

4 Thomas Berry and Keith Jacks Gamble. "Informed Local Trading Prior to Earnings Announcements." *Journal of Financial Markets* 16, no. 3 (2013): 505–525. https://doi.org/10.1016/j.finmar.2012.07.001

5 Gjergji Cici, Laura Dahm and Alexander Kempf. "Trading Efficiency of Fund Families: Impact on Fund Performance and Investment Behavior." EFA Vienna Meetings Paper (22 December 2015). http://dx.doi.org/10.2139/ssrn.2514203

6 Gjergji Cici and Claire M. Rosenfeld. "A Study of Analyst-Run Mutual Funds: The Abilities and Roles of Buy-Side Analysts." *Journal of Empirical Finance* 36(C) (2016): 8–29. https://doi.org/10.1016/j.jempfin.2015.12.004

7 Gjergji Cici, Laura Dahm and Alexander Kempf. "Trading Efficiency of Fund Families: Impact on Fund Performance and Investment Behavior." EFA Vienna Meetings Paper (22 December 2015). http://dx.doi.org/10.2139/ssrn.2514203

8 Haitao Li, Xioayan Zhang and Rui Zhao. "Investing in Talents: Manager Characteristics and Hedge Fund Performances." *Journal of Financial and Quantitative Analysis* 46, no. 1 (2011): 59–82. http://doi.org/10.1017/S0022109010000748

9 Aron A. Gottesman and Matthew R. Morey. "Manager Education and Mutual Fund Performance." *Journal of Empirical Finance* 13, no. 2 (2006): 145–182. https://doi.org/10.1016/j.jempfin.2005.10.001

10 Diversity Matters: The Role of Gender Diversity on U.S. Active Equity Fund Performance. Vanguard Research, June 2022.

11 Citywire's Alpha Female report, as at 12 September 2023. https://citywire.com/Publications/WEB_Resources/alpha-female/alpha-female-2023-sterling.pdf

12 Eric K.M. Tan and Anindya Sen. "Does Educational Diversity of Managers Matter for the Performance of Team-Managed Funds?" *Accounting & Finance* 59 (2016): 801–830. https://dx.doi.org/10.2139/ssrn.2766816

13 Michaela Baer, Alexandra Niessen-Ruenzi and Stefan Ruenzi. "The Impact of Work Group Diversity on Performance: Large Sample Evidence from the Mutual Fund Industry." Centre for Financial Research Working Paper, No. 07-16, University of Cologne, Cologne, Germany, September 2007. https://dx.doi.org/10.2139/ssrn.1017803

14 Gjergji Cici, Monika Gehde-Trapp, Marc-André Göricke and Alexander Kempf. "The Investment Value of Fund Managers' Experience Outside the Financial Sector." *The Review of Financial Studies* 31, no. 10 (2018): 3821–3853. https://doi.org/10.1093/rfs/hhy019

15 Leonard Kostovetsky and Vladimir Ratushny. "Returns to Specialization: Evidence from Health Mutual Fund Managers." Carroll School of Management Working Paper, Boston College, April 2016. https://dx.doi.org/10.2139/ssrn.2794383

16 Eric K.M. Tan and Anindya Sen. "Does Educational Diversity of Managers Matter for the Performance of Team-Managed Funds?" *Accounting & Finance* 59 (2016): 801–830. https://dx.doi.org/10.2139/ssrn.2766816

17 Gjergji Cici, Monika Gehde-Trapp, Marc-André Göricke and Alexander Kempf. "The Investment Value of Fund Managers' Experience Outside the Financial Sector." *The Review of Financial Studies* 31, no. 10 (2018): 3821–3853. https://doi.org/10.1093/rfs/hhy019

18 K.J. Martijn Cremers. "Active Share and the Three Pillars of Active Management: Skill, Conviction and Opportunity." *Financial Analysts Journal* 73, no. 2 (2017): 61–79. https://dx.doi.org/10.2139/ssrn.2860356

19 Chunhua Lan, Fabio Moneta and Russell R. Wermers. "Holding Horizon: A New Measure of Active Investment Management." American Finance Association Meetings 2015 Paper, Asian Finance Association 2018 Conference, 1 December 2020. http://dx.doi.org/10.2139/ssrn.2517215

20 Chunhua Lan, Fabio Moneta and Russell R. Wermers. "Holding Horizon: A New Measure of Active Investment Management." American Finance Association Meetings 2015 Paper, Asian Finance Association 2018 Conference, 1 December 2020. http://dx.doi.org/10.2139/ssrn.2517215

21 Marcin T. Kacperczyk and Amit Seru. "Fund Manager Use of Public Information: New Evidence on Managerial Skills." Sauder School of Business Working Paper, University of British Columbia, December 2004. http://dx.doi.org/10.2139/ssrn.623102

22 K.J. Martijn Cremers. "Active Share and the Three Pillars of Active Management: Skill, Conviction and Opportunity." *Financial Analysts Journal* 73, no. 2 (2017): 61–79. https://dx.doi.org/10.2139/ssrn.2860356

23 Kelsey D. Wei, Russell R. Wermers and Tong Yao. "Uncommon Value: The Characteristics and Investment Performance of Contrarian Funds." *Management Science* 61, no. 10 (2014): 2394–2414. http://dx.doi.org/10.1287/mnsc.2014.1982

24 Chris Tidmore, David J. Walker and Francis M. Kinniry, Jr. *The Urban Legends of Active Share.* Vanguard, 2019.

25 Shema Mitali. "Common Holdings and Mutual Fund Performance." Geneva School of Economics and Management Working Paper, University of Geneva, 5 August 2019. http://dx.doi.org/10.2139/ssrn.3448494

26 Andrea M. Buffa and Apoorva Javadekar. "Decomposing Fund Activeness." Leeds School of Business Working Paper, University of Colorado at Boulder, December 2020. http://dx.doi.org/10.2139/ssrn.3597969

27 Baruch Lev. "The Deteriorating Usefulness of Financial Report Information and How to Reverse It." Accounting and Business Research 48, no. 5 (2018): 465–493. http://dx.doi.org/10.1080/00014788.2018.1470138

28 Baruch Lev and Anup Srivastava. "Explaining the Recent Failure of Value Investing." Stern School of Business Working Paper, New York University, 25 October 2019. http://dx.doi.org/10.2139/ssrn.3442539

29 Ethan Rouen, Eric C. So and Charles C. Y. Wang. "Core Earnings: New Data and Evidence." Harvard Business School Accounting and Management Unit Working Paper No. 20-047, November 2020; Journal of Financial Economics, forthcoming. http://dx.doi.org/10.2139/ssrn.3467814

30 Andrew Clare and Mariana Clare. "An Examination of Ex Ante Fund Performance: Identifying Indicators of Future Performance." *Journal of Asset Management* 20, no. 3 (2019):175–195. https://doi.org/10.1057/s41260-019-00118-4

31 Andrew Clare and Mariana Clare. "An Examination of Ex Ante Fund Performance: Identifying Indicators of Future Performance." *Journal of Asset Management* 20, no. 3 (2019):175–195. https://doi.org/10.1057/s41260-019-00118-4

32 Rob Arnott, Vitali Kalesnik and Lillian Wu. 2017. "The Folly of Hiring Winners and Firing Losers: Part III of Alice in Factorland." Research Affiliates Publications. https://www.researchaffiliates.com/content/dam/ra/publications/pdf/706-the-folly-of-hiring-winners-and-firing-losers.pdf

Investment risk information

The value of investments, and the income from them, may fall or rise and investors may get back less than they invested.

Past performance is not a reliable indicator of future results.

Important information

This is directed at professional investors and should not be distributed to, or relied upon by retail investors.

This is designed for use by, and is directed only at persons resident in the UK.

The information contained herein is not to be regarded as an offer to buy or sell or the solicitation of any offer to buy or sell securities in any jurisdiction where such an offer or solicitation is against the law, or to anyone to whom it is unlawful to make such an offer or solicitation, or if the person making the offer or solicitation is not qualified to do so. The information does not constitute legal, tax, or investment advice. You must not, therefore, rely on it when making any investment decisions.

Issued by Vanguard Asset Management Limited, which is authorised and regulated in the UK by the Financial Conduct Authority.