Vanguard

Keys to improving the odds of active management success

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- Although Vanguard has a global reputation as an indexing expert, the firm also manages over 408 billion USD in actively managed equity assets in the US and has been offering actively managed funds since its founding in 1975. During this time, the firm developed a distinct active management philosophy which has produced a track record of success.

- Active management is challenging. However, we believe there are three factors which are most critical to improving the probability of outperformance: low cost, top talent, and patience.

  - Low cost continues to be the most effective quantitative filter that has shown, with some consistency, to improve performance.

  - However, no quantitative factor alone can ensure outperformance. Indeed, a rigorous and thoughtful qualitative manager-selection process also must be present to identify top talent.

  - Finally, patience is necessary because positive excess returns are inconsistent, even among managers who outperform over the long-term.

- We find that low-cost active funds run by talented managers can achieve long-term outperformance for patient investors, as demonstrated by the results generated by Vanguard active equity funds.

Introduction

Why is Vanguard, a firm many investors outside of the United States recognise as an indexing expert, publishing research on active management? Unbeknown to many investors, Vanguard has offered actively managed funds for nearly four decades. In the US, Vanguard has over 408 billion USD in actively managed equity mutual fund assets under management. This places Vanguard as the third largest active equity mutual fund manager in the world.[1] Vanguard utilises both in-house management as well as external subadvisers[2] to manage active equity assets, giving the firm extensive experience in internal active management as well as active manager selection. Through this experience, we have formulated an approach to offering actively managed equity portfolios that reflects best practices refined over the past four decades.

In this paper, we analyse and explain the three factors we've found to be most critical when trying to improve the odds of outperformance: low-costs, top-talent, and patience. Indexing is an excellent option for constructing a portfolio, but when investors choose active management in place of or as a complement to indexing, we offer our approach to active manager selection which we believe increases the probability of success. In addition, we share a historical performance analysis of our actively managed equity funds which substantiates the effectiveness of our philosophy.

Outperforming with active managers is challenging

Over the past 20 years, just 19% of actively managed UK equity mutual funds outperformed their prospectus benchmarks[3]. Additionally, research has shown that the underperformance of actively managed funds is relatively consistent across various countries, market segments, and time periods. Why does this occur?

The poor performance of active managers can be understood through the zero-sum game in financial markets. The zero-sum game explains that within any market, the holdings of all market participants aggregate to form that market (Sharpe, 1991). Therefore, every pound of outperformance one investor achieves in the market is offset by a pound of underperformance for other investors in the market. This offsetting of gains and losses would appear to suggest an outperformance probability of 50%. However, the concept assumes no transaction-related costs (or taxes). In reality, these costs can be significant, and they reduce the returns investors realise over time (Westaway, 2014). While both active and index funds are subject to costs, research shows that the expense ratios for actively managed funds are typically higher. Active European equity funds, for example, charge an average of 1.66% while comparable index funds charge 0.37% (Westaway, 2014).

One potential counter argument to this powerful concept is that active mutual fund managers do not represent the totality of active investors in a given market; other investors include, but are not limited to, hedge funds, pension funds, separately managed account managers and holders of individual securities. So, if active fund managers were able to outperform systematically their benchmark before costs, then this might suffice to compensate for, or even outstrip, the harmful effects of higher costs on performance. Westaway (2014) suggests that such an outcome is unlikely and provides evidence that the average active fund manager is unable to compensate for higher costs and as a consequence will still have a higher probability of underperforming relative to passively managed funds.

Another factor impeding the prospect of outperforming with active managers is the lack of persistence among top-performing managers (Carhart, 1997; Brown, 1995). It has long been stated that past performance is not indicative of future results, but many investors are still tempted to select mutual funds by recent performance. Westaway (2014) confirms that past performance is unreliable when trying to identify active managers who will outperform in the future. Not only is past performance a weak predictor, but according to significant research, most other quantitative measures of fund attributes or performance (such as fund size, active share, past alpha, etc.) are equally undependable when used to identify future outperformers (Wallick, 2015; Financial Research Corporation, 2002; Philips, 2010; Schlanger, 2012).

Although this large volume of research clearly presents many of the challenges in obtaining successful active management, we do find that investors' odds can be improved by utilising low-cost mutual funds.

1 Morningstar data as of 31 December 2014

2 Many of Vanguard's actively-managed funds are managed by external, independent managers who are hired by Vanguard to manage to a particular mandate, such as Global Equities or Small-Caps. Throughout this document, we refer to them as "subadvisers."

3 Vanguard calculations using Morningstar data for the following categories: Europe Flex-Cap Equity, Europe Large-Cap Blend Equity, Europe Large-Cap Growth Equity, Europe Large-Cap Value Equity, Europe Small-Cap Equity, Eurozone Flex-Cap Equity, Eurozone Large-Cap Equity, Eurozone Mid-Cap Equity, Eurozone Small-Cap Equity, Global Emerging Markets Equity, Global Flex-Cap Equity, Global Large-Cap Blend Equity, Global Large-Cap Growth Equity, Global Large-Cap Value Equity, Global Small-Cap Equity, UK Flex-Cap Equity, UK Large-Cap Blend Equity, UK Large-Cap Growth Equity, UK Large-Cap Value Equity, UK, Small-Cap Equity, US Flex-Cap Equity, US Large-Cap Blend Equity, US Large-Cap Growth Equity, US Large-Cap Value Equity, and US Small-Cap Equity. Note: Because of fees, most index funds also underperform their benchmarks.

Low costs: Improving the odds of active management success

Many investors search for the quantitative "silver bullet" that would enable them to identify talented managers in advance. In this ongoing search for the *perfect* metric, many overlook a *very good* metric that can improve the odds of success when selecting actively managed mutual funds – the expense ratio (Wallick, 2015; Financial Research Corporation, 2002; Kinnell, 2010). A fund's current expense ratio – a simple and readily available figure – has historically proved to be an effective predictor of relative future fund performance. Intuitively, this approach seems to make sense because an investor's return is decreased by every pound spent on investment-related costs.[4] Yet, some may argue that a higher cost manager is indicative of a more skilled manager, and therefore they would be able to overcome a higher cost hurdle. Our results suggest otherwise.

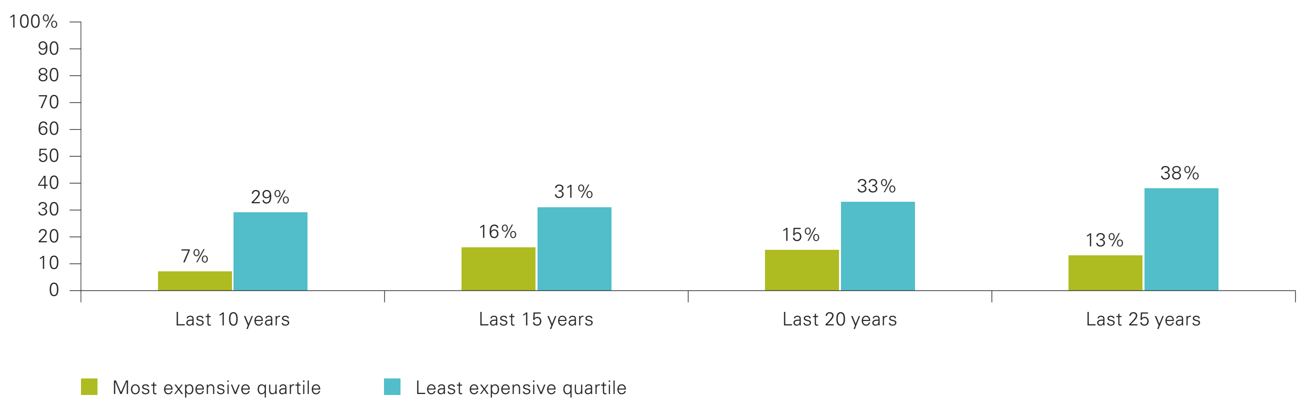
This relationship can be seen in Figure 1, where we graph the portion of actively managed equity funds that have outperformed their prospectus benchmarks in the United Kingdom. The blue bars display the portion of outperforming funds in the least expensive quartile while the green bars display the portion of outperforming funds in the most expensive quartile.

Two conclusions can be drawn from this chart. First, there is a clear trend in each time period of lower costs leading to higher relative performance. Second, although this trend is favourable for low-cost funds, it does not by itself lead to consistently identifying active funds that will outperform. Indeed, if we look at the average of the four overlapping periods, we see that 33% of the funds in the universe outperformed their benchmark – still well below 50/50 odds.

It should be noted that the graph is calculated relative to benchmarks which are costless. If we lower the benchmark returns by 20 bps to compensate for the cost of investing in a low-cost index fund, the probability of the lowest-cost quartile funds succeeding rises from 33% to 39%.

As a result, although low cost has proven to be the most consistent and effective quantitative factor that investors can use (ex-ante) to noticeably improve their odds[5], it does not, by itself, guarantee success. Instead, a combination of both low cost and talent helps give investors the best chance of achieving success using active management.[6]

Figure 1: Percentage of actively managed funds available for sale in the United Kingdom that have outperformed their benchmark



Past performance is not a reliable indicator of future results

Notes: Period ended 31 December 2014. Because of fees, most index funds also underperform their benchmarks. Our analysis utilised expenses and fund returns for all active equity funds available for sale to UK investors that were alive at the start of each analysis period. Their performance was compared with their prospectus benchmark. Funds which were merged or liquidated are considered underperformers for the purposes of this analysis.

Source: Vanguard calculations using data from Morningstar Inc. The following fund categories from the Morningstar UK fund database were included: Europe Flex-Cap Equity, Europe Large-Cap Blend Equity, Europe Large-Cap Growth Equity, Europe Large-Cap Value Equity, Europe Small-Cap Equity, Eurozone Flex-Cap Equity, Eurozone Large-Cap Equity, Eurozone Mid-Cap Equity, Eurozone Small-Cap Equity, Global Emerging Markets Equity, Global Flex-Cap Equity, Global Large-Cap Blend Equity, Global Large-Cap Growth Equity, Global Large-Cap Value Equity, Global Small-Cap Equity, UK Flex-Cap Equity, UK Large-Cap Blend Equity, UK Large-Cap Growth Equity, UK Large-Cap Value Equity, UK, Small-Cap Equity, US Flex-Cap Equity, US Large-Cap Blend Equity, US Large-Cap Growth Equity, US Large-Cap Value Equity, and US Small-Cap Equity.

4 The median expense ratio for Vanguard active equity funds was 0.36% as of 31 December 2014. The median for non-Vanguard active equity funds was 1.34% as of 31 December 2014. See Appendix C for a summary of the expense ratio impact.

5 See Wallick (2015).

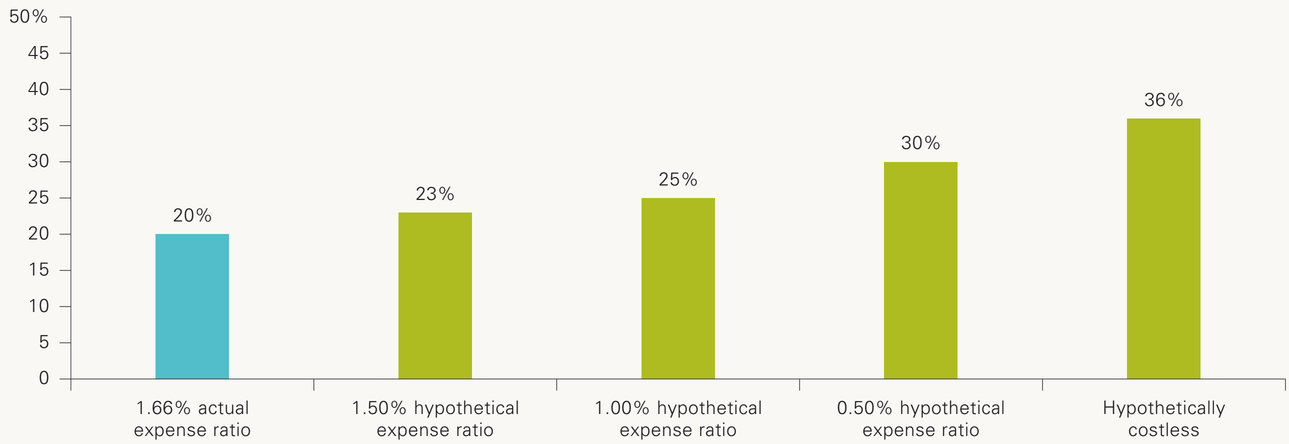
6 For investors and/or advisers who are using actively managed UK equity funds, investors should be aware that due to the typically higher turnover associated with running an active portfolio, there will likely be an additional return drag from the impact of stamp duty reserve taxes. As such, to reap the full benefits of leaving equity non-tax-sheltered, portfolios with low turnover (such as broad market index equity funds) should be considered.

What if I receive institutional pricing for actively managed funds?

The analysis in Figure 1 utilises a combination of retail and institutional funds from the Morningstar Inc. database. These funds have an average expense ratio of 1.66%. Some large investors may reasonably question whether the analysis can be applied directly to their situation given that they have access to lower cost institutional pricing. To address this valid question, we explored the outperformance probabilities for all available funds, but this time using lower hypothetical expense ratios based on potential fee levels that larger investors may find more relevant. By using these lower hypothetical expense ratios, the average net excess returns of the universe of mutual funds increases.

The figure below displays the results. While the outperformance probabilities, as expected, increase as the hypothetical expenses applied to the funds decrease, the probabilities are still notably below 50%.

Figure A: Percentage of funds outperforming their benchmark after applying lower hypothetical expense ratios, 2000–2014



Note: The hypothetical expense ratios do not represent the cost of any particular investment. They are simply examples of pricing levels which some large institutions may pay to access active strategies.

Source: Vanguard calculations using data from Morningstar.

Top Talent: Identifying the best managers

How can investors identify talented managers? While there has been a plethora of academic studies that suggest shortcuts for identifying a skilled active manager, much of the industry has settled on using some variation of the "4 Ps" cited by Vanguard founder Jack Bogle in 1984 – people, philosophy, portfolio, and performance[7]. Vanguard still uses a similar version of these criteria today:

Performance drivers	
Firm	Is there a culture of investment excellence and stewardship? Is the firm financially stable and viable?
People	Are the key investors experienced, talented, and passionate? Do they have the courage to have a differentiated view but the humility to correct a mistake?
Philosophy	Does the firm have a clear philosophy on how it seeks to add value that is universally shared by the investment personnel?
Process	Does the manager have a competitive advantage enabling it to execute the process well and consistently over time? Can the process be effectively implemented given the assets under management?

Outcomes	
Portfolio	Do the historical portfolio holdings and characteristics align with the manager's philosophy and process?
Performance	Given its process, are the drivers of historical performance logical? Are the drivers of returns sustainable over the long term?

One might ask that if these factors are truly effective and so widely used, why has the overall success rate of using active managers not been higher? Two reasons. First, the application of these factors remains subjective, not formulaic, and the human judgment and the robustness of the evaluation process can vary widely. Second, although there are six total factors, the most crucial intersection here is obtaining top talent (those managers who have the skill to outperform) at a low cost. Solving this paradox is not easy. Indeed, some organisations face significant structural barriers that impede their ability to execute on this key point.

Seeking to solve the low-cost/top-talent paradox

Both low cost and top talent are crucial for active management to be successful, and yet it can seem paradoxical that the two would coexist. Presumably, the best managers command higher management fees, while only more marginal managers would accept a relatively low fee. Yet Vanguard has been adept at delivering top talent at a low cost. These six specific factors characterise Vanguard's active management approach.

Unique ownership structure helps to provide a decisive cost advantage

In the US, Vanguard is the only *mutually* owned fund company in the asset management business. This distinction is critical. Vanguard is owned collectively by the funds it operates. These funds in turn are owned by their shareholders.

This unique ownership structure enables the firm to provide its services to the Vanguard funds at cost, devoid of any profit margins built in at other fund companies. As a result, Vanguard charges the Vanguard funds only what it costs Vanguard to provide services to the funds – never an additional layer of fees to pay someone else's return on capital. By contrast, a firm that has issued public stock to disperse ownership or one that is owned by a small group of private investors is typically obligated to provide those investors with a return on the capital they have invested in the firm. This additional layer of fees may pose a hurdle to providing low-cost funds.

While this unique ownership structure cannot be replicated outside the US for country-specific legal and regulatory reasons[8], the *spirit* of the approach is the same, as increasing scale breeds lower costs that over time have been passed on to investors in the form of lower expense ratios on the funds.

Flexibility to utilise internal portfolio management teams or external specialists

Vanguard's actively-managed funds are managed by a combination of internal portfolio management teams and a variety of external subadvisers. In all cases, we select the manager that we believe is best-positioned to manage a particular strategy based on a range of considerations. In practice, internal teams are often utilised when a mandate calls for a highly systematic, risk-controlled, disciplined, and typically quantitative approach. And since it is extremely difficult to build internal teams of portfolio managers, researchers,

7 See *The Clash of the Cultures* for a fuller look at Mr Bogle's discussion of these factors. Vanguard's Portfolio Review Department (PRD) still uses a similar version of these criteria today to select managers, as they apply this philosophy to a range of managers and investment styles, including fundamental active equity, fundamental active fixed income, quantitative active equity, and quantitative active fixed income.

8 For example, Vanguard Asset Management in the UK operates as a wholly-owned subsidiary of the Vanguard Group, Inc.

and analysts covering the broad range of market segments and sectors globally, mandates that call for specialist knowledge and experience benefit from the selection of world-class managers who are experts in and typically focused on a particular style of investing, such as in small-caps, emerging markets equities, or large-cap growth companies.

Symmetrical performance-based fees align manager and client interests

Whether internally-managed or delegated to an external subadviser, the managers' interests are aligned with that of the investor. Vanguard provides investment advisory services on an at-cost basis, and the subadvisers charged with the responsibility are in part compensated based upon performance in relation to the fund's objectives on a long-term basis.

All of Vanguard's external subadvisers are paid a base fee that is a percentage of assets managed. In addition, the vast majority also have their contracts structured with a performance-based incentive fee, which rewards the manager for outperforming the fund's benchmark.

Large scale reduces fee levels

Vanguard is the largest user of subadvisers in the world, managing more than 408 billion USD of active equity mutual fund assets in the US via 30 subadvisers.[9] This typically leads to large individual mandates for each subadviser, often starting at a billion dollars with the potential to grow from there. Placing these large mandates offers two major benefits to fund shareholders. First, when subadvisers manage large sums of money, the absolute dollar value of management fees they receive can be substantial, even if the percentage fee is relatively small.

Second, managers also recognise the operational benefits of these sizable mandates. It is much easier for subadvisers to handle a single $1 billion relationship with Vanguard than 20 different $50 million relationships. The potential cost to acquire and service 20 different accounts versus 1 can be considerable and managers are acutely aware of this. As a result of both of these factors, scale reduces costs while maintaining the ability to attract top talent.

Long-term perspective attracts talent

Another factor distinctive to Vanguard is the length of time it maintains relationships with talented individual managers. On average, Vanguard engages managers for more than 14 years, demonstrating the firm's commitment to partnering with talented subadvisers and developing long-term relationships.

This long average tenure, when coupled with large mandates, results in a favourable economic proposition for subadvisers. This beneficial structure is not lost on managers. Therefore, the net present value of the cumulative fees they expect to receive from Vanguard is greater than what they would expect to obtain from relationships that may pay a higher fee but typically do not last as long. As a result, many top-quality managers are eager to work as subadvisers for Vanguard funds even though the annual basis point fees they receive from Vanguard may be lower than what they might otherwise earn.

CEO-led search and oversight process sustains long-term perspective

Vanguard has been committed to both active management and indexing ever since we started our manager search process more than 30 years ago. Since then, the Portfolio Review Group (PRG), which is chaired by Vanguard's CEO and consists of long-tenured senior executives, has overseen all Vanguard funds as well as the hiring and firing of all managers.[10] As a result, there have only been three leaders of the firm's manager search efforts in the past four decades. Today, PRG is supported by more than 20 investment professionals dedicated to the manager oversight and search process.

PRG's long-term stability reduces the potential to overreact to short-term events and promotes manager evaluation continuity. In contrast, manager-selection processes that are reliant upon a single decision-maker can increase the likelihood of manager turnover, especially if that particular individual leaves the firm or changes roles. The continued commitment of long-tenured Vanguard CEOs and senior executives to the manager search process is one of the reasons the process has been so consistent through the years.

Patience: Acknowledging the "bumpy road" to outperformance

While low costs and a rigorous, thoughtful manager selection process can go a long way to improve an investor's results utilising active management, those benefits can be eroded significantly if an investor fails to maintain a long-term perspective. This is because there is inconsistency inherent in excess returns. Understanding this inconsistency is critical for investors who may be tempted to use short-term past performance as a primary basis for entering and exiting active funds. Our following analysis of 540 active equity funds available for sale in the UK confirms the difficulty of selecting winning managers, but also highlights that historically investors have had to be very patient with those managers to collect on their success.

9 As of 31 December 2014.

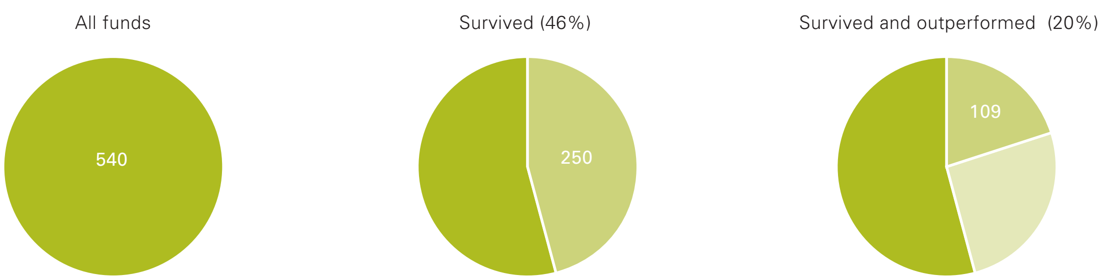
10 The Portfolio Review Group (PRG) has oversight responsibility, but as is the case with all registered US mutual funds, the board of trustees has the ultimate fiduciary responsibility.

Of the 540 active equity funds in existence at the start of 2000, only 250 (46%) even remained in existence 15 years later as of 31 December 2014. The rest had been merged or liquidated, often due to poor performance. Of the remaining 250 funds, just 109 (20% of the original 540) managed to outperform their prospectus benchmark during the period (see Figure 2). These findings are consistent with previous research – achieving outperformance is tough.

Yet, some managers *have* outperformed. Many investors assume that if they are able to select a talented manager, a relatively smooth stream of excess returns awaits. Unfortunately, we find the opposite to be true. Even the most successful funds (the 109 which outperformed during the 15 year analysis period) experienced frequent and sometimes extended periods of underperformance along the way.

Figure 3 displays the distribution of outperforming funds according to their number of individual years of underperformance. We can see that 108 – or 99% of the outperforming funds – experienced at least four individual calendar years in which they lagged their prospectus benchmarks. In fact, more than 50% had seven or more individual years of underperformance.

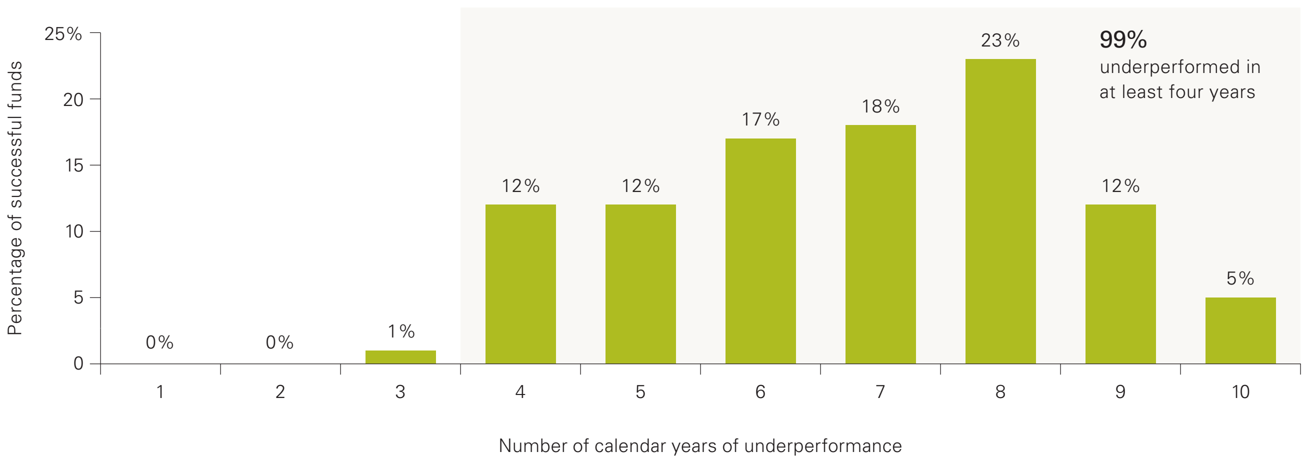
Figure 2: A small portion of active funds survived *and* outperformed over 15 years



Past performance is not a reliable indicator of future results.
Note: The funds' returns were measured against their prospectus benchmarks.
Source: Vanguard calculations using data from Morningstar.

Figure 3. Even successful funds experienced multiple periods of underperformance

Distribution of the 109 successful funds by total calendar years of underperformance, 2000–2014



Past performance is not a reliable indicator of future results.
Note: Successful funds are those that survived for the 15 years and also outperformed their prospectus benchmarks.
Source: Vanguard calculations using data from Morningstar.

But what about *consecutive* years of underperformance? Investors may be able to withstand individual years of underperformance scattered over the 15 year holding period, but for many investors, three *consecutive* years of underperformance represents a breakpoint after which they will divest the fund. This can occur either for an explicit reason (for example, a requirement in an investment policy statement) or because it may violate some mental rule of thumb (for example, an assumption that three years of underperformance indicates an unskilled manager). In Figure 4, we show the portion of the original 540 funds that survived for 15 years, beat their benchmarks, *and* avoided three consecutive years of underperformance. The results are pronounced: only 28 – or 5% – of the initial 540 funds met these criteria.

Our findings strongly suggest that investors should refrain from using short-term performance as a primary criterion for divesting (or investing in) an active equity fund. Short-term underperformance will likely accompany an active fund that achieves long-term outperformance.

Therefore, for investors interested in pursuing active management, it is important to understand that to increase the odds of success they must be willing and able to endure numerous and potentially extended periods during which their fund will lag its benchmark. As mentioned previously, this long-term focus is an important principle in the selection and monitoring process of Vanguard's active equity subadvisers.

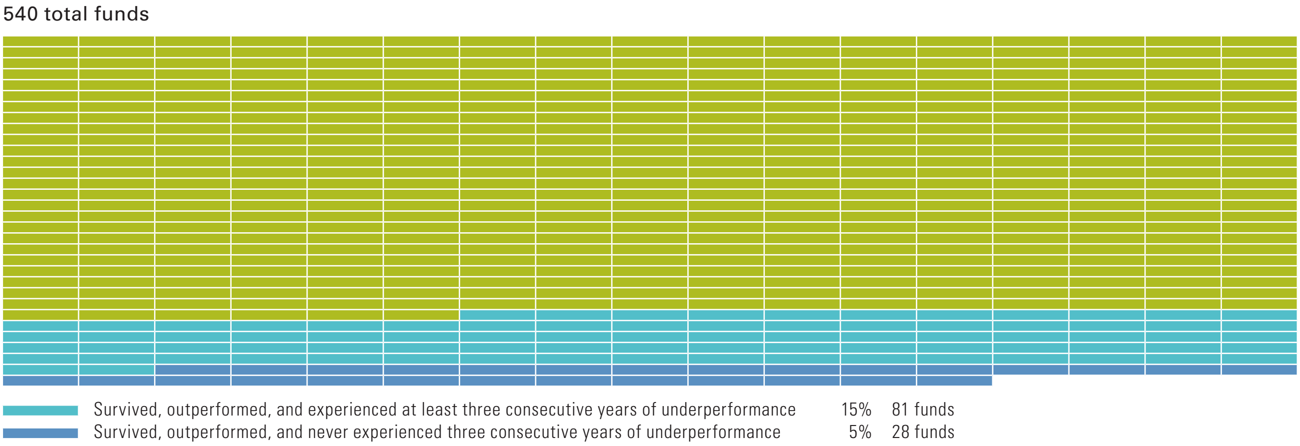
Vanguard's active management results – excess return analysis

While the prior sections covering Vanguard's active management philosophy of low costs, top talent, and patience are useful, they do not, by themselves, demonstrate that Vanguard has been successful utilising this philosophy. Evidence of Vanguard's success can be found in our US domiciled active equity track record of performance, which over the past 30 years has produced positive excess returns versus stated fund benchmarks, resulting in a cumulative benefit to shareholders of 27 billion USD.[11] A deeper analysis of Vanguard active fund performance follows.

The client experience

From 1985 to 2014, Vanguard has offered 37 actively managed equity mutual funds in the US.[12] To measure the success or failure of these funds, we use three different methodologies to weight the performance impact of each fund. First, we weight each fund equally to analyse the performance of the fund lineup. This method analyses performance from the perspective of an investor with an equal opportunity or willingness to invest in any of the funds. Second, we measure performance on an asset-weighted basis (funds with more assets under management were given more weight than funds with less assets) to account for what might be the more likely client experience, since an investor is more likely to be invested in a large fund than a small fund. Third, we

Figure 4: Few funds avoided three consecutive years of underperformance



Past performance is not a reliable indicator of future results.

Note: The funds' returns were measured against their prospectus benchmarks. Returns cover the period 2000–2014.

Source: Vanguard calculations using data from Morningstar.

11 Monthly excess returns versus funds' stated benchmarks were multiplied by monthly assets under management and compounded through time from January 1985 through December 2014.

12 This figure includes stand-alone active equity funds available to all US investors. It includes both fundamental and quantitative active management strategies. It does not include fund of funds, which are composed of individual Vanguard active equity mutual funds, or funds that were offered exclusively to institutional investors. Seven funds were merged or liquidated during the period, but their returns have been included in Vanguard performance calculations in Figure 2. There are 37 active US-domiciled funds available to US investors: 26 US equity funds, 6 global or international equity funds and 5 sector equity funds.

weight the funds according to Vanguard portfolio-construction guidelines of market proportionality. This last approach excludes specialty funds and counts large-, mid-, and small-cap funds in line with the approximate amount they reflect in the overall market and also incorporates non-US funds to the degree our advice has suggested for US based investors (10% to 30% depending on the historical year). The results produced by each of these weighting methodologies can differ substantially from one another during some periods since assets under management in a given mutual fund does not always align with its weight in an equal-weighted or market-cap weighted portfolio.

Gauging Vanguard performance

As Figure 5 illustrates, for all three weighting methodologies over the full 30 year term examined, Vanguard provided investors with positive excess returns. An equal-weighted portfolio produced 0.33% of annualised excess return relative to the funds' stated benchmarks. On an asset-weighted basis, the annualised excess return has been 0.45% over the past 30 years. On a market-proportional basis, the typical investor would have experienced 0.11% of annual excess return relative to the costless benchmark. All of these calculations cover the 30 years ended 31 December 2014 and include all Vanguard equity funds that existed during the analysis period, whether the funds survived the entire period or not.

This analysis compares the Vanguard active funds with their costless benchmarks. If we assume an index fund was available for every costless benchmark at a fee of 20 basis points, then the annualised benefits to investors increase to approximately 0.53% on an equal-weighted basis, 0.65% on an asset-weighted basis, and 0.31% on a market-proportional basis.

Appreciating the pattern of returns

While calculations for the entire period are positive using each weighting approach, it is worth reiterating from the *Patience* section above that this does not imply that for each quarter, year, or even decade, clients experienced a positive result. There can be extended periods of time when managers underperformed or were relatively neutral compared with the benchmark.

As a result, we conclude that if a given fund or group of funds is able to beat the odds and produce excess returns in the long term, those returns will only be captured by investors who stay committed. Timing markets decreases investors' chances of success, as does timing managers.[13] Instead, to be successful, it's better for investors to identify low-cost providers able to engage top talent and then hold those actively managed funds over long time horizons.

Figure 5: Annualised excess returns of Vanguard active equity funds over their stated benchmarks, net of fees, 1985–2014

	Past 10 years	Past 20 years	Past 30 years
Equal-weighted all funds	0.19%	0.89%	0.33%
Asset-weighted all funds	0.80%	1.11%	0.45%
Market proportional-weighted* excludes sector funds	0.24%	0.63%	0.11%

Past performance is not a guarantee of future results.

* The market-proportional-weighted methodology weights the underlying funds according to the approximate Vanguard portfolio-construction guidelines that existed at the time.

Notes: The performance of each Vanguard fund was compared with its stated benchmark using monthly return data from January 1985 through December 2014. The returns for all non-US, global, and domestic large-, mid-, and small-cap Vanguard active equity funds, including those which were merged or liquidated during the period, were included in the performance calculations. The active equity portions of our balanced funds were excluded. Specialty funds were included in the equal-weighted and asset-weighted portfolios but not in the market-proportional portfolios. In our calculations, the portfolios of Vanguard active equity funds are assumed to be rebalanced monthly to the target weights (as determined by the equal-weighting, asset-weighting, and market-proportional-weighting methodologies) across all Vanguard active equity funds alive in a given month. All fund performance data is net of fees. There are 37 active US-domiciled funds available to US investors: 26 US equity funds, 6 global or international equity funds and 5 sector equity funds.

Source: Vanguard.

13 See Goyal (2008) for a further discussion of this topic.

Others have found similar positive results for Vanguard funds

We have conducted our analysis using excess return – how a fund did relative to its respective costless benchmark. Others might suggest that an assessment of alpha, not excess return, would also be valuable.[14] While examining a fund's excess return relative to a benchmark offers the audience a calculation of what an actual investor's experience would have been relative to a costless benchmark, an analysis of alpha could determine the source of the excess return: was it security selection or factor tilts that lead to the excess return? Both analyses have their benefits and both have been studied by other researchers.

Reinker (2004) and Rodriguez (2007) found the existence of positive excess return in Vanguard funds, while Kizer (2005) challenged their findings. But the findings in each of these studies lacked statistical significance. Blanchett (2010), on the other hand, conducted seven different alpha tests on three different groups of Vanguard funds between 1975 and 2008 (making it the longest academic study conducted) and found sizable positive alpha that was statistically significant. Averaging the seven different assessments across all three test groups, Blanchett found that, on average, Vanguard funds produced an annual average positive alpha of 1.08%.[15]

Vanguard active management results compared with other funds

While comparing Vanguard actively managed funds with their respective costless benchmarks is valuable, it also can be useful to compare Vanguard's active funds with other active funds. In order to be able to effectively compare Vanguard funds with non-Vanguard funds, data availability on non-Vanguard funds restricts us to the following approach[16]: (i) use 15 years' worth of data, and (ii) compare active funds within the Morningstar US database and are categorised in one of their nine US style boxes or three broad non-US categories. The analysis compares both Vanguard funds and non-Vanguard funds to their primary prospectus benchmarks. We incorporate all funds from the universe into our analysis, including those which were merged or liquidated during the analysis period, so our results are free of survivorship bias. The summary results of our analysis show the median excess returns for two groups of funds – Vanguard active and non-Vanguard active. This process excludes those funds that do not align with the selected Morningstar style box categories, such as specialty funds.

Comparison with other active funds

For the 15 years ended 31 December 2014, we find that the median results of Vanguard active funds compares favourably with the universe of other available actively managed funds. Figure 6 displays the 5-, 10-, and 15-year results. The excess return for the median actively managed Vanguard fund outperformed the median excess return for the actively managed non-Vanguard fund by 1.25% annually over the past 15 years. The results also favoured Vanguard for the ten-year period where the median actively managed Vanguard fund outperformed the median non-Vanguard active fund by 0.58% annually. For the five-year period ended 31 December 2014, the median returns for the Vanguard fund outperformed the median non-Vanguard active fund by 0.72%.

Figure 6: Median annualised excess returns, net of fees

	Past 5 yrs	Past 10 yrs	Past 15 yrs
Vanguard active	-0.27%	-0.01%	1.08%
Non-Vanguard active	-0.99%	-0.59%	-0.17%
Difference	**0.72%**	**0.58%**	**1.25%**

Past performance is not a reliable indicator of future results.

Notes: Analysis includes US and non-US equity funds (excluding sector/specialty funds) for the 15 year period ended 31 December 2014. Active funds compared with their prospectus benchmarks.

Source: Vanguard and Morningstar, Inc.

14 In discussing our analysis and the research performed by others, we use the term "excess return" to refer to the difference between the geometric returns of active funds versus their benchmarks. We use the term "alpha" to refer to the outperformance of active funds calculated using a regression model.

15 There are four notable published studies assessing Vanguard's active funds: Reinker (2004) and Rodriguez (2007), who conducted excess return studies comparing the synthetic portfolios of Vanguard funds versus synthetic portfolios of index funds; Kizer (2005), who runs an analysis using the Fama-French 3-factor model; and Blanchett (2010), who conducts several analyses using the Carhart 4-factor model, a return-based style analysis and various other methods. Reinker (2004) found that an asset-weighted portfolio of Vanguard active US equity funds outperformed a portfolio of US index funds by an average annualized amount of 1.02% over the period of 1977–2003. Reinker (2004) also calculates the excess returns of Vanguard active non-US equity funds versus a portfolio of non-US index funds to be 0.71% over the period of 1991–2003. Kizer (2005) argues that the results of Reinker (2004), when adjusted for the size and style overweights inherent in an asset-weighted portfolio of Vanguard active funds, are less favourable. Using the Fama-French 3-factor model, he calculates the difference in performance between Vanguard active equity funds and index equity funds to be -0.21% per year from 1977 to 2003, but the amount is statistically insignificant. Rodriguez (2007) found that a portfolio of Vanguard active equity funds outperformed a portfolio of index funds by 0.46% annually from 2003 to 2006, although the outperformance was not statistically significant at the 95% confidence level. Blanchett (2010) uses seven different tests and three test groups for each to calculate alpha from 1975 to 2008. When the results are averaged together, he reports a statistically significant annualised alpha of 1.08%, with each of the three test groups in all seven tests showing a positive alpha.

16 This methodology is similar to the approach used in Figure 5 except that we shorten the analysis period to 15 years and exclude specialty funds due to the availability of quality data for non-Vanguard funds.

Overall, the median Vanguard active equity fund has outperformed the median non-Vanguard active equity fund over the past 5-, 10- and 15-year periods by substantial amounts. Vanguard active funds also perform well relative to low cost index funds, which generally trail their benchmarks by 10-30 basis points. A focus on keeping costs low, finding skilled managers, and being patient has helped to drive superior performance versus the broad active equity fund universe – low costs being the key starting point which lowers the hurdle talented managers need to clear. Indeed as of 31 December 2014, the average US-domiciled Vanguard active equity fund charges 0.37%, and, according to Morningstar data, this is less expensive than *75%* of the US-domiciled equity index funds available to investors and an astounding *99%* of the US domiciled active equity funds.[17]

While the previous analysis has all dealt with median results, it is important to note that the dispersion of returns is typically quite different between Vanguard active funds, non-Vanguard active funds, and indexed funds. What we see from a dispersion analysis is that for the 15-year analysis period, while the median excess return for Vanguard active funds was 1.08%, the 75th and 25th percentile outcomes ranged from 2.26% to 0.27%. All other active funds had an even wider range of results spanning from 1.40% to -1.66% due to greater dispersion of both returns and fees. At the same time, index funds had a much tighter pattern of results ranging from just -0.13% to -0.51%.[18] So while the median excess return for Vanguard active funds has been successful, that success comes with a wider dispersion of possible results relative to index funds.

Conclusion

We believe that successful active management is driven by the combination of low cost, top talent, and patience. While it is intuitive that lower fees should reduce the hurdles necessary to outperform a benchmark, low costs alone cannot guarantee active management success. On average, most active managers have underperformed their benchmarks and the managers who have succeeded over long time periods are rare. Herein lies an apparent paradox: in order to achieve success, one must engage rare talent at a low cost.

Despite this seemingly difficult hurdle, Vanguard has been able to successfully deliver actively managed equity funds. Over long periods of time, the median Vanguard active equity fund has outperformed its stated costless benchmark as well as the median non-Vanguard active equity fund.

While Vanguard active funds have been successful, the use of any active fund comes with volatility that can affect investors in two ways. First, there can be extensive periods when the return on a group of active funds underperforms their respective benchmarks or comparable index funds. Second, even when the return on an aggregate group of funds does well, certain individual funds within the overall cohort can still do poorly. Therefore, individual fund selection will influence an investor's results.

As a result, given the inherent volatility of any individual active fund, only those investors with the patience to withstand what could be extensive periods of underperformance should consider actively managed funds. Timing managers is as counterproductive as timing markets, offering little prospect of success. Instead, for investors to have the chance to be successful using active management, they need to be able to obtain top talent at low cost and have the discipline to stick with it over the long term.

In the end, we find that the most crucial factor is low cost. While indexing has, to many, become synonymous with low cost, the historical data actually shows a more nuanced reality – low cost, and therefore improved odds of investor success – can exist in both active and indexed funds.

17 The average Vanguard fund expense ratio calculation is an equal-weighted average across all share classes. The average index fund and active fund expense ratio calculations are an equal-weighted average across all share classes of non-Vanguard index funds and active funds domiciled in the US See Appendix C for more detailed results.

18 This relationship between funds was similar for the 10-year period ended 31 December 2014. During this time the median active Vanguard performance was -0.01% with a distribution of 0.88% to -0.72% (for the 75th and 25th percentiles), all other active funds had a median performance of -0.59% with a distribution of 0.47% (75th percentile) to -1.68% (25th percentile) while index funds had a median performance of -0.25% with a distribution of -0.08% (75th percentile) to -0.51% (25th percentile). The same analysis over five years had the median Vanguard performance at -0.27% with a distribution of 0.92% (75th percentile) to -1.05% (25th percentile), all other active funds' performance was -0.99% with a distribution of 0.36% (75th percentile) to -2.41% (25th percentile) while index fund performance was -0.28% with a distribution of -0.15% (75th percentile) to -0.54% (25th percentile).

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Appendix A – Weights used for Vanguard funds in the market proportional methodology

The fund category weights used in the analysis are intended to approximate Vanguard's portfolio construction guidelines over the last three decades.

Market proportional weighted (with 0% sector funds)

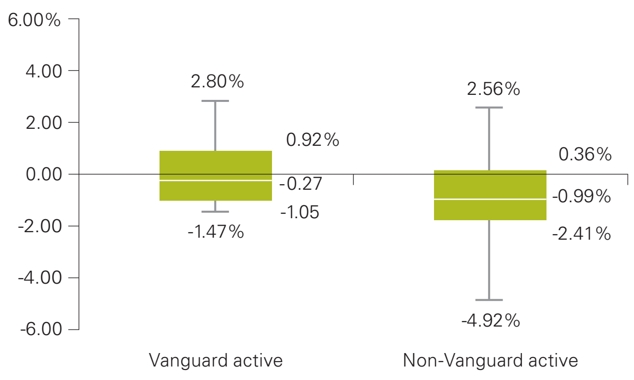
	January 1985 – December 1993	January 1994 – December 2003	January 2004 – December 2014
Large value	35.00%	31.25%	27.50%
Large growth	35.00%	31.25%	27.50%
Mid/Small value	10.00%	8.75%	7.50%
Mid/Small growth	10.00%	8.75%	7.50%
International	10.00%	20.00%	30.00%
Sector	0.00%	0.00%	0.00%

Notes: These portfolios are hypothetical and do not represent any particular mutual fund

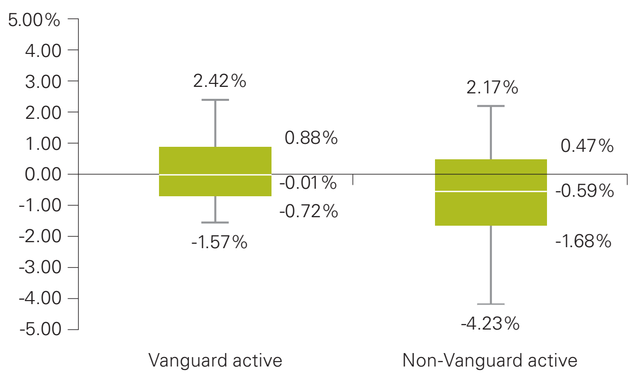
Source: Vanguard

Appendix B – Annualised excess returns

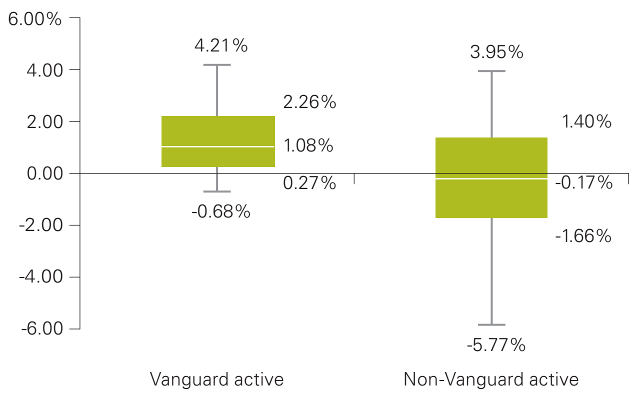
5 years – Annualised excess returns, net of fees



10 years – Annualised excess returns, net of fees



15 years – Annualised excess returns, net of fees

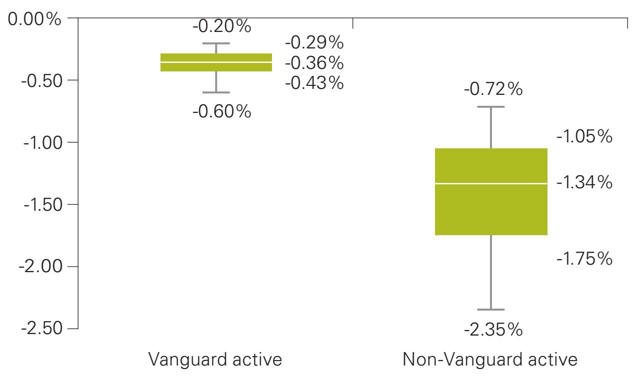


Past performance is not a reliable indicator of future results.

Notes: Data includes US and non-US equity funds (excluding sector/specialty funds).

Sources: Vanguard calculations using data from Morningstar for period ended 31 December 2014.

Appendix C – Expense ratio impact, 2014



Past performance is not a reliable indicator of future results.

Notes: Data includes US and non-US equity funds (excluding sector/specialty funds).

Sources: Vanguard calculations using data from Morningstar for period ended 31 December 2014.

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