Reframing investor choices: Right mindset, wrong market

Vanguard Commentary

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- Many individuals use decision heuristics, or shortcuts, to make decisions in life ranging from the relatively insignificant (such as choosing a restaurant) to the more significant (such as choosing a doctor). A common shortcut is the use of rating systems based on the assumption that past performance will continue in the future. Use of this information as part of an informed decision process works well in most areas of our lives; therefore, it is only natural to apply a similar process to investment decision making. However, it often falls short when it comes to making investment decisions.

- One way to improve investor outcomes is to reframe the decisions that investors face—away from a past-performance orientation and toward a future orientation. In addition, we suggest that a deeper understanding of the decision-making process using past performance needs to change when it comes to investing.

- This paper outlines a framework that advisors can use to help modify investor behavior, including education, communication, and promotion of self-awareness. These aspects support both a long-term perspective and a disciplined approach in the midst of rising and falling markets.

Individuals routinely make decisions of varying scope and significance. Some decisions are made daily and are quite small, such as whether to have a cup of tea or coffee with breakfast, whereas other decisions are made much less often and are quite consequential, such as whether to pursue a certain career or medical treatment. Investment decisions similarly range from small to large and from frequent to infrequent—such as subtle choices between similar funds or exchange-traded funds (ETFs) to more consequential decisions such as portfolio asset allocation, fees and expenses, or tax-efficient trading.

Extensive academic literature examining both conventional and financial choices has sought to explain how individuals make the choices they do. The "heuristics and biases" literature in behavioral finance, in particular, focuses on the role that decision-making shortcuts (heuristics) or biases play in influencing outcomes. Heuristics and biases can be either beneficial or detrimental to long-term outcomes. For example, inertia as a bias may be beneficial to investors by encouraging a "stay the course" approach in the face of stock market volatility. But it also can be detrimental when investors fail to save in retirement plans, or when they become inattentive to risk and fail to properly rebalance their portfolios in rising or falling markets.[1]

This paper discusses a particular decision heuristic common to portfolio construction: reliance on past-performance data to forecast future outcomes, a reliance that may be intentional or unintentional (see the accompanying box, "The past-performance heuristic"). Many investors apply the same decision-making process they use successfully in many areas of their lives to their investment decision-making.

We draw comparisons between common nonfinancial choices, such as choosing a college or a physician, where past performance may have some predictive value, and investment choices, where the link between past performance and future results is tenuous, at best. We recommend a number of approaches that investors and advisors can use to offset the influence of past performance as a decision heuristic, allowing them to more successfully focus on expected long-term outcomes.

The past-performance heuristic

According to the past-performance heuristic, if an investment has done well in the recent past, it will continue to do well in the future; similarly, if it has done poorly in the recent past, it will continue to do poorly in the future. The past-performance heuristic is compounded by the widespread availability of past-performance data in the marketplace, driven both by legal requirements and by money managers touting recent investment success. The sheer availability of this data may cause investors to weight it more heavily in their decision-making than they otherwise would, or should.

A past-performance bias is furthermore supported by the granularity and variability of performance data. Although past performance of specific portfolios is actually hard to come by, performance data on individual securities and individual asset classes and sub-asset classes are readily available in the marketplace. Short-term or granular data change frequently, and often change by large amounts—again unduly attracting investor attention.

Notes on risk:

Please remember that all investments involve some risk. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income.

Diversification does not ensure a profit or protect against a loss.

All investing is subject to risk, including possible loss of principal.

1 For an overview of the investor literature on decision heuristics and biases, see Barber and Odean (2011); also, Kahneman (2011) discussed this literature in a broader context.

A simple decision framework

Consider a common rational framework for making decisions independent of the specific domain—that is, whether, for instance, it's a decision to buy a car, choose a college education, visit a doctor, or construct a portfolio. The decision-making process typically begins with recognition of both a need and its importance, followed by an information-gathering process—for example, from formally published or online data, or conversations with friends/colleagues (see **Figure 1**). The process then proceeds to evaluating alternatives and then making an actual choice. The final step is a post-evaluation period in which the individual assesses his or her satisfaction with the outcome.

Today, the information-search process has been enhanced dramatically by the internet, offering a multitude of information sources that consumers tend to rely on and trust. According to Charlton (2011, cited in Econsultancy, 2015), 63% of online customers are more likely than not to make a purchase from an internet site that has user reviews, and such reviews are nearly 12 times more trusted than manufacturers' descriptions. Rating services, consumer reviews, and the full utility of the internet, all would seem to enable individuals to make better decisions today than in the past.

Yet for a variety of reasons, even this simple framework can become unworkable. Information overload makes it hard for people to sift through what is relevant versus what is not. Confronted by voluminous data, they seek some type of shortcut to make an informed choice. (Note that these shortcuts are themselves often accessed through the internet.) One such shortcut is to rely on rating services—in which "experts" use a formal rating system to report what other individuals are doing and saying (e.g., ratings of dishwashers in *Consumer Reports*). Another approach is to rely on numerical data that are widely available and disseminated—for example, data on the maintenance and reliability records of makes of automobiles, or in the asset management industry, past-performance data on investment products.

For numerous consumer goods, past performance can often reasonably be linked to future expectations. Performance ratings for goods and services as diverse as education, automobile purchases, fine dining, and health care can share similar predictability and, therefore, reliability: An institution, product, or service that is highly rated one year will likely be highly rated the next year, and a below-average-rated institution, product, or service one year will likely be similarly rated the next.

For example, one of the best-known college ranking systems is *U.S. News & World Report*'s "Best Colleges." This annual ranking allows users to compare the relative quality of institutions for higher education. When viewing college rankings from 2004 through 2013, we found that the top-ten yearly institutions changed little, as shown in **Figure 2**, on page 4. Unlike the *lack of a pattern* in sub-asset-class investment returns that we see next in **Figure 3**, on page 5, here there seems to be a closer relationship in the absolute rankings from year to year. This indicates a very high chance that a university that is highly rated one year will continue to be so rated the following year. In addition, of the schools rated in the top ten in 2004, eight of them were still in the top ten in 2013 and had remained so over the entire period; the two that fell out (Dartmouth College and Washington University in Saint Louis) remained in the top 15 (placing 11th and 14th, respectively). Also, each of the schools in the top three remained in the top three for the full ten-year period.

Figure 1. Five-step rational decision-making process

Source: Vanguard.

It is important to note that these are absolute rankings, so quartile rankings would show even more persistence. Furthermore, this pattern is much less changeable than those shown later in **Figures 3**, **5**, and **7**, in which the capital markets and fund managers changed quartiles on a regular basis.

This persistence and durability in outcomes can be seen in the ratings for several other common life decisions, including choice of an automobile, a fine-dining establishment, or a heart surgeon, each of which is summarized in this paper's appendix. In each of these decision-making domains, we found that future performance was also plausibly linked to recent ratings and other assessments of past performance.

For the reasons we delineate in the sections following, however, a past-performance approach typically fails when making investment choices.

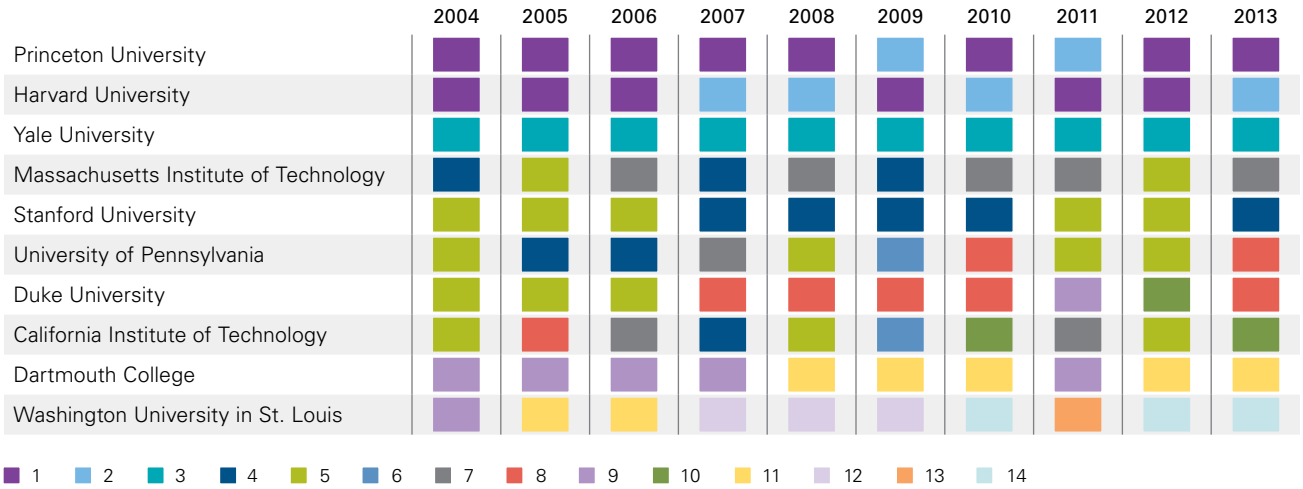
Problems with past-performance heuristic

In a number of traditional scientific disciplines, outcomes in the real world are closely governed by certain scientific theories (or laws of nature), making prediction a hallmark of the scientific and experimental process. For example, in astronomy, the relative position of the earth, sun, and moon can be predicted with exceptional precision many years into the future by relying on today's inputs such as current coordinates, relative speeds of rotation, and the laws of celestial mechanics. The social sciences, however, while governed by their own rules or theories, are furthermore characterized by large error terms, arising from unpredictable decision-making by both households and firms. Thus, predicting an economy's gross domestic product (GDP) three years hence is a difficult challenge, despite voluminous available data on current economic activity. Like economic forecasting, investment forecasting is an imprecise social science, in which expected outcomes are both cyclical and random owing to changing information and market participants' varying expectations.

Using past performance to make investment-selection decisions is particularly problematic because the durability of inputs in the social sciences is more dynamic (changeable), at best, than in the "hard sciences, and is misleading, at worst. Top-performing asset classes one year commonly do not repeat as leaders the next year, and historical performance retrospectively appears more random than predictive (see Figure 3).

Past performance is also a misleading decision-making benchmark for economic reasons. Strong past performance leads to investment valuations that are higher than those at the beginning of the period being examined, making the investment, all else equal, less attractive in the future.

Figure 2. Top-ten U.S. schools, as rated by *U.S. News & World Report*: 2004–2013



Notes: If two or more universities received the same score, we considered it a tie; hence, multiple universities could have the same ranking in a given year. For example, in 2004, Stanford University, University of Pennsylvania, Duke University, and California Institute of Technology had a four-way tie for fifth place.

Sources: Vanguard, based on data from *U.S. News & World Report*'s Best Colleges (2004–2013).

Figure 3. No discernible pattern in the annual returns for selected stock indexes: 2001–2015

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
14.02%	32.07%	56.28%	29.03%	34.54%	32.59%	39.78%	10.11%	79.02%	29.09%	5.17%	19.43%	43.30%	13.45%	6.97%
–2.37%	21.99%	50.64%	25.95%	25.55%	31.05%	32.67%	–28.92%	39.80%	24.50%	2.64%	18.63%	34.52%	13.05%	5.67%
–3.54%	–6.00%	48.54%	24.88%	19.77%	27.84%	16.84%	–36.85%	37.21%	19.20%	0.39%	18.43%	33.48%	5.60%	4.09%
–5.59%	–8.71%	46.03%	22.25%	14.39%	23.48%	11.81%	–38.44%	35.06%	17.75%	–1.18%	18.05%	32.53%	4.22%	–1.38%
–9.23%	–11.43%	45.96%	17.28%	13.64%	22.69%	11.45%	–38.54%	34.47%	16.71%	–2.91%	17.51%	26.93%	–1.82%	–3.82%
–18.22%	–15.52%	32.49%	16.49%	7.05%	22.25%	7.05%	–42.46%	29.91%	15.51%	–5.50%	17.28%	23.59%	–2.68%	–5.22%
–18.89%	–15.60%	30.03%	16.48%	5.26%	13.35%	6.49%	–43.68%	20.58%	12.60%	–11.65%	15.26%	22.94%	–2.97%	–5.54%
–20.42%	–15.76%	29.75%	14.31%	4.71%	9.07%	3.48%	–46.49%	19.69%	9.03%	–11.82%	14.59%	–1.22%	–3.31%	–7.47%
–24.41%	–27.88%	20.72%	12.14%	4.15%	6.94%	–0.17%	-47.02%	13.49%	5.21%	–14.59%	1.51%	–2.27%	–4.06%	–14.60%
–31.93%	–30.26%	18.52%	6.30%	–9.20%	–15.09%	–9.78%	-53.18%	4.39%	3.81%	–18.17%	0.08%	-4.56%	–4.92%	–32.86%

Russell 1000 Value Index
Russell 2000 Value Index
Russell 1000 Growth Index
Russell 2000 Growth Index
MSCI EAFE Value Index
MSCI EAFE Growth Index
S&P GSCI Total Return Index

Less than full history

MSCI Emerging Markets
Citigroup WGBI Non-US
MSCI EAFE Small + Mid Cap

Notes: 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. MSCI EAFE Small + Mid Cap is Morgan Stanley Capital International index of mid- and small-capitalization non-U.S. stocks; MSCI Emerging Markets is MSCI index of emerging markets stocks; Citigroup WGBI Non-US is an index of non-U.S. bonds; MSCI EAFE is MSCI index of large-cap non-U.S. stocks; Russell 1000 indexes contain large- to mid-cap stocks; Russell 2000 indexes contain small-cap stocks; S&P GSCI Total Return is Standard & Poor's total return index of commodities futures.

Sources: Vanguard, based on data from MSCI, Citigroup, Russell, and Standard & Poor's.

Similarly, poor trailing investment returns may lead to an investment being more fairly valued (or even available at a substantial discount) than at the beginning of the time series, thus creating a more attractive opportunity. In other words, relying on past performance as a decision heuristic is at odds with a basic model of investment valuation.

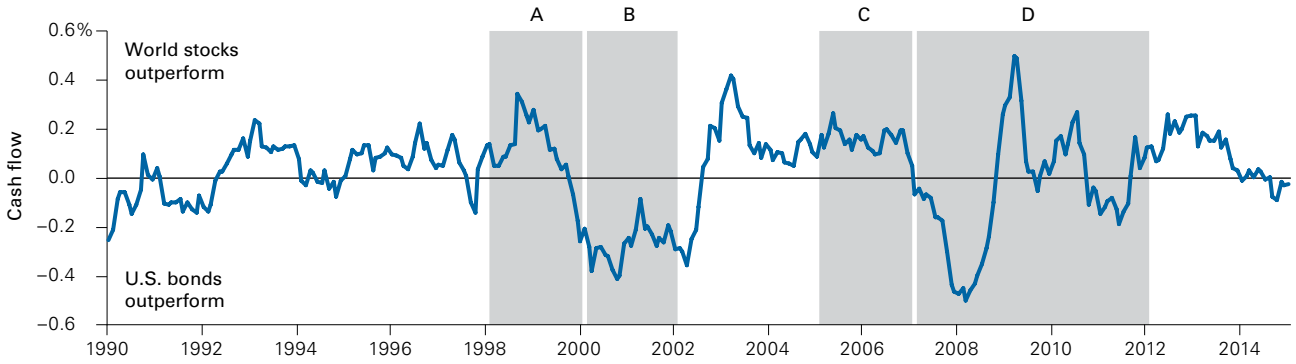
The allure of historical data

Despite these problems, past performance remains a dominant decision heuristic due to its sheer availability. Required U.S. financial disclosure for retail investors for mutual funds and ETFs requires display of year-to-date, one-, five-, and ten-year returns. Past-performance records are a matter of course in prospectuses, advisory agreements, statements of clients' accounts, and industry data published on the web. Short-term returns change more frequently, and fluctuate by larger amounts, thus attracting investors' attention all the more. Often the only offsetting, legally mandated risk disclosure in a communication is that "past performance does not guarantee future results." Yet, measured in terms of pure volume and availability of information, the past-performance warning pales in comparison with information generated on historical returns.

As a result, many individual and institutional investors inadvertently become momentum investors, investing new cash flows when prices are rising, and selling when prices are falling. Historical studies of mutual fund cash flows show that, after protracted periods of relative outperformance in one area of the market, sizable cash flows tend to follow (**Figure 4**).

Figure 4. Cash flows in market segments wax and wane over time, dependent on trailing performance

Rolling 12-month excess returns: Total world stock market versus U.S. bond market: 1990–2015



	Year	Equities	Bonds
A	1999	$162B	$–7B
	2000	$258B	$–51B
B	2001	$81B	$83B
	2002	$50B	$132B
C	2006–2007	$393B	$194B
D	2008–2012	$–58B	$1,266B

Notes: Data as of December 31 for each year cited. Excess return is difference between return of broadly diversified world stocks and that of U.S. bonds. World stocks represented by MSCI All Country World Index; U.S. bonds represented by Barclays U.S. Aggregate Bond Index.

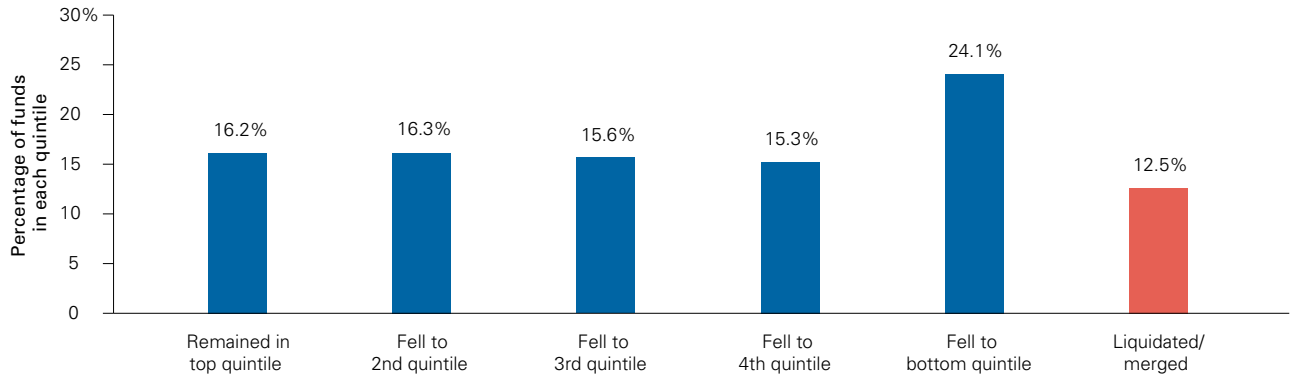
Sources: Vanguard, based on data from MSCI and Barclays.

The tendency of many investors to rely on a past-performance heuristic is furthermore confounded by the question of manager skill. Some investors would argue that historical outperformance could indicate a manager's skill—and this may be true. At the same time, most money managers are likely to be highly skilled in one way or another (such as in their cognitive ability, breadth of investment experience, or knowledge of markets and instruments); but rarely are they highly skilled in all of these ways all the time. The link between superior past performance in any given period and skill may be as much a coincidence as it is evidence of a strong scientific link between the two. Indeed, the academic literature on performance and skill shows a very weak link between past and future performance. The historical lack of consistent, year-to-year outperformance by fund managers (see Wimmer, Chhabra, and Wallick, 2013) may actually be more indicative of something else—a relatively level playing field in which most managers are similarly skilled.

Consider the mutual funds ranked in the top quintile of performance as of December 31, 2010, and their subsequent five-year performance through December 31, 2015 (**Figure 5**). At the end of the period, only 16.2% of the funds remained in the top quintile—not that different from the 12.5% of funds that were liquidated or merged. Furthermore, a roughly equal number of funds fell to quintiles 2 through 4, and more than two times as many managers dropped into the bottom quintile or were liquidated/merged (combined) as remained in the top quintile.

These results seem consistent with a simple assumption—namely, that the means necessary to gain the advantage over other managers (such as in cognitive ability, investment experience, or trade execution) are rather uniformly distributed among most market participants. This contributes to a zero-sum game, in which the routine exchange of performance leadership from one manager to another is the rule, not the exception.

Figure 5. Subsequent five-year performance (through 2015) of funds originally ranked in top quintile for five years ended December 31, 2010



Notes: All data reflect performance for five years following December 31, 2010 (that is, ended 2015). Far-left column shows percentage of all active U.S. equity funds remaining in top quintile of performance as of December 31, 2015, within each of Morningstar's nine style categories based on funds' excess returns relative to stated benchmarks. The other columns show the percentage of funds that fell to the remaining quintiles over the five years ended December 31, 2015, as well as those that were liquidated or merged.

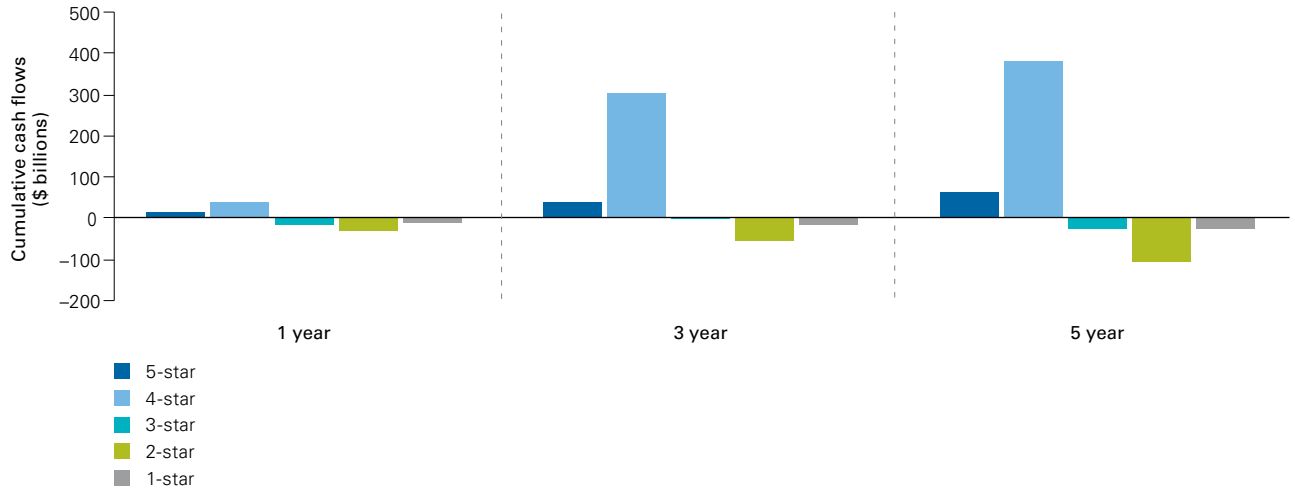
Sources: Vanguard calculations, based on data from Morningstar, Inc.

Past performance and rating systems

In their ongoing quest for value, investors may turn to other, more complex methods for evaluating performance, such as manager or fund rating systems. Again the thought is that ranking systems, which may be useful in other decision-making domains, may also work with investment choices. One example is the Morningstar "star rating" system, one of several rating methodologies the company offers. Morningstar's star system assigns each fund a star rating, with 1 being the lowest rating and 5 being the highest. The rating is based on each fund's risk-adjusted returns over the previous three-, five-, and ten-year periods after taking costs into account. This rating system thus has a built-in past-performance bias. And evidence on how it influences investor decisions suggests that the ranking system has an effect similar to that of past-performance data. For instance, Vanguard research (Philips and Kinniry, 2010) has shown that the majority of cash flows go into mutual funds awarded a 4- or 5-star Morningstar rating (**Figure 6**), whereas money flowed out of funds with a rating below 4 stars. However, once the 4- and 5-star funds received their top ratings, their actual performance deteriorated in the subsequent 36 months (**Figure 7**).

Relying on past performance as a good predictor of future performance may make sense in certain scientific disciplines or in certain personal decisions in daily life. But not when it comes to investing. In its own defense, Morningstar (2010) has noted that its star ratings are "intended for use as the first step in the fund evaluation process. A high rating alone is not a sufficient basis for investment decisions." Over the past several years Morningstar has also moved to a more qualitative "analyst medal" rating system, recognizing that past performance may have been given too much weight in its system. The fact remains that rating systems, as a decision-making shortcut, still appeal to investors, advisors, and institutions.

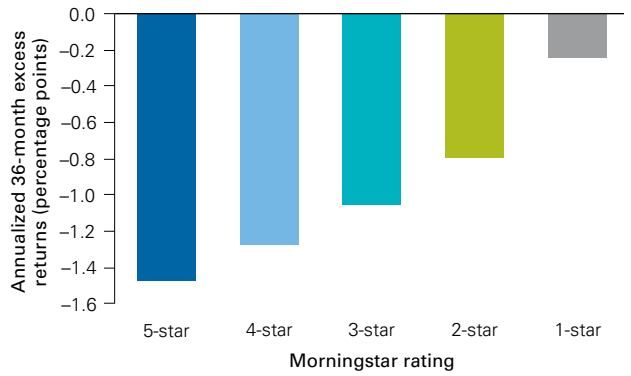
Figure 6. Cumulative cash flows after receiving a Morningstar rating



Note: Data as of December 31, 2015.

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

Figure 7. Subsequent 36-month excess return after receiving Morningstar rating



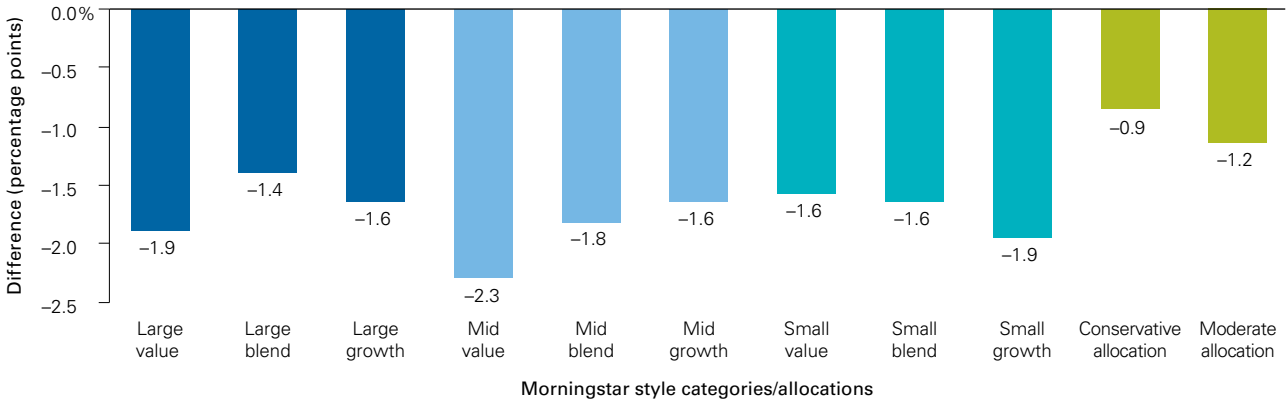
Notes: Data covers the period from June 30, 1992 through December 31, 2015. Morningstar changed its rating methodology during this period, but there was no material impact on our analysis. The analysis includes all share classes of U.S. Equity funds, both live and obsolete. To be included, a fund had to have a Morningstar Rating and 36 months of continuous performance following the rating date. Fund returns are net of expenses, but not of any loads. The results are relative to the funds' category benchmark as defined by Russell, however similar results were achieved relative to MSCI and Standard and Poor's indexes as well.

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

Positive ratings lead to strong cash flows, even though the ratings are based on past-performance data with little predictive value. According to Foley (2014), writing in the *Financial Times*, "investment advisors say it is impossible to get their clients to buy anything that does not have a four- or five-star rating, no matter how many times they are warned that the past is no guide to the future," and that "repeated academic studies have shown that, when the Morningstar algorithm spits out a change to a fund's performance ranking, money will pour in or out."

So whether investors are relying on past-performance data alone, or rating systems linked to that data, the result is the same. New investor cash flows track recent performance, and as a result, investor returns, or the actual experience of fund investors, tend to lag the total returns of the vehicles in which they invest (**Figure 8**).

Figure 8. Difference between ten-year investor and fund returns



Notes: Data as of December 31, 2015, based on Morningstar style and asset allocation categories. Morningstar Investor Return assumes the growth of a fund's total net assets for a given period is driven by market returns and investor cash flow. To calculate investor return, a fund's change in assets for the period is discounted by the return of the fund, to isolate how much of the asset growth was driven by cash flow. A proprietary model, similar to an internal rate-of-return calculation, is then used to calculate a constant growth rate that links the beginning total net assets and periodic cash flows to the ending total net assets.

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

Reframing investor decisions

How should investors, then, seek to reduce or eliminate the influence of past performance on investment choices?

First and foremost, one must recognize and understand that the decision process that serves well in most areas of decision-making does not work in investing. One can then reframe the investment process away from selection of investments based on recent performance data and toward decisions based on long-term planning and future goals. To incorporate such reframing, we suggest that investors rely on a four-part decision-making process based on Vanguard's long-held investing principles (Vanguard, 2014; for a brief summary of these principles, see Appendix I, on page 12). The process involves development of a financial plan that uses clear and appropriate goals; selection of a broadly diversified portfolio across asset classes; minimizing of investment costs; and making portfolio changes in response to market conditions in a disciplined way, namely through rebalancing (see **Figure 9**).

More specifically, we propose the following three practical approaches that advisors can use to help modify investor behavior—that is, to move away from an excessive focus on past performance.

1. **Educate yourself and your clients** on why the process of investment selection based on recent past performance differs materially from other life decisions, both large and small, and why it must change.
2. **Communicate with empathy and understanding**, promoting self-awareness in clients about how deeply ingrained the past-performance, relative-comparison mentality is in everyone, professionals included, and that shifting away from it can be difficult for many investors and advisors.
3. **Execute a reframing of investment decision-making** so that it focuses more on aspects that are actually within investors' control, such as long-term portfolio construction principles and goal-setting, rather than recent market performance. Although review of past performance can be informative, be sure to devote a larger fraction of client communications to the long-term outlook for financial markets, the pursuit of goals, and the need for a disciplined, forward-looking process for portfolio construction (as reflected in the four-part process just outlined). Highlight also elements of the process—such as asset allocation or the level of fees, whose effects are not as salient as performance and are often neglected—and describe their impact on long-term outcomes.

Figure 9. Four-step process for investment decisions

Source: Vanguard.

Conclusion

Reliance on past performance can be a useful decision heuristic for many life decisions. Because the process has served us well in many areas of life, it's only natural for investors to apply it to investment decision-making. However, the past-performance heuristic is a generally unproductive way to choose investments, mainly because there are too many independent variables in investing whose initial conditions can change dramatically over time.

Investment flows suggest that a meaningful proportion of investor cash flow continues to be driven by past-performance data—both published data and data embedded in fund-rating systems. One reason for this is that past-performance data are widely available and relied upon. Short-term results or results for a narrow or specialized asset class often can exhibit extreme returns, thus further capturing investors' attention. As this paper has emphasized, even as money flows into investments based on past results, to make decisions predicated on that past performance flies in the face of conventional measures of investment valuation. This is because strong past investment performance is invariably associated with higher relative valuations and lower relative results going forward.

In this environment, we recommend three steps that advisors can take to counter this inherent behavioral bias in investment decision-making. These include educating investors on the limited value of past-performance data; communicating and promoting self-awareness that this process is deeply ingrained and that a shift away from this mentality can be extremely difficult; and executing a successful reframing of the investment process by emphasizing the importance of controlling those things that investors can actually control, such as long-term portfolio construction principles and goal-setting, rather than recent market performance.

References

Barber, Brad M., and Terrance Odean, 2011. The Behavior of Individual Investors; available at http://ssrn.com/abstract=1872211.

Charlton, Graham, 2011. Ecommerce Consumer Reviews: Why You Need Them and How to Use Them. Cited in Retail/E-Commerce Industry Report for Q3 2011, Econsultancy.com, July 8, 2015; available at https://econsultancy.com/blog/9366-ecommerce-consumer-reviews-why-you-need-them-and-how-to-use-them/.

Consumer Reports, 2005–2014 (variable years). *Buying Guide;* available at http://www.consumerreports.org/cro/2012/05/books-and-guides/index.htm.

Foley, Stephen, 2014. Morningstar: A Force to Be Reckoned With. *Financial Times,* August 21; available at http://www.ft.com/intl/cms/s/0/e02d2768-22d2-11e4-8dae-00144feabdc0.html#axzz3tfty0K4T.

Kahneman, Daniel, 2011. *Thinking, Fast and Slow.* New York: Farrar, Straus and Giroux.

Kinniry, Francis M., Jr., Colleen M. Jaconetti, Michael A. DiJoseph, and Yan Zilbering, 2014. *Putting a Value on Your Value: Quantifying Vanguard Advisor's Alpha*. Valley Forge, Pa.: The Vanguard Group.

Michelin Guide, 2006–2015 (variable years); available at http://www. Michelinguide.com/Restaurants.

Morningstar.com, 2010. The Morningstar Rating for Funds; available at http://corporate.morningstar.com/us/documents/MethodologyDocuments/FactSheets/MorningstarRatingForFunds_FactSheet.pdf.

Philips, Christopher B., and Francis M. Kinniry Jr., 2010. *Mutual Fund Ratings and Future Performance*. Valley Forge, Pa.: The Vanguard Group.

Society of Thoracic Surgeons, 2015. STS Facts; available at http://www.sts.org/sites/default/files/documents/pdf/STS%20Fact%20Sheet%202015%20September_0.pdf.

U.S. News & World Report, 2004–2013 (variable years). Best Colleges; available at http://colleges.usnews.rankingsandreviews.com/best-colleges.

Vanguard Group, The, 2014. *Vanguard's Principles for Investing Success.* Valley Forge, Pa.: The Vanguard Group.

Wallick, Daniel W., Brian R. Wimmer, and James J. Balsamo, 2015. *Shopping for Alpha: You Get What You Don't Pay For.* Valley Forge, Pa.: The Vanguard Group.

Wimmer, Brian R., Sandeep S. Chhabra, and Daniel W. Wallick, 2013. *The Bumpy Road to Outperformance.* Valley Forge, Pa.: The Vanguard Group.

Appendix I. Vanguard's investing principles

Overview of *Vanguard's Principles for Investing Success*

1. **Develop an investment plan that has clear, appropriate goals.**[2] A well-defined plan, including the return needed to meet your goals, the risk you are willing and able to bear, and a savings strategy, is the foundation for investment success. Be sure your plan is designed to endure changing market environments and is flexible enough to allow for adjustments along the way.

2. **Diversify, both among and within asset classes.** A sound investment strategy starts with determining an asset allocation that is suitable for the portfolio's objective, is built upon reasonable expectations, and uses diversified investments to avoid exposure to unnecessary risks. Just as the broad asset allocation decision should be based on the concept of balance, so too should the decision to diversify within asset classes. Markets are never perfectly correlated, whether across size, style, or geography, and as such, some investment idea out there will always "do better." Diversification can help minimize the regret of missing out on these opportunities while also mitigating the risk of outsize losses from taking concentrated bets.

3. **Minimize cost.** There's a saying in the consumer world that "you get what you pay for." In many ways, this makes sense. Whether a reflection of actual quality or merely the perception of quality, price is often the indicator used to judge the value of a consumer good. As Vanguard research has emphasized, however, when it comes to investing, "you get what you *don't* pay for" (Wallick, Wimmer, and Balsamo, 2015). It comes down to simple math: Gross returns minus costs equal net returns—the returns an investor actually keeps. Although numerous studies have shown that cost is the best predictor of future investment performance and that lower-cost investments typically outperform higher-cost investments, investors may be reluctant to purchase low-cost investments because they may equate low cost with low value. Understandably, for instance, people may prefer to avoid certain "low-cost" hotels or "low-cost" restaurants if they feel they won't have a desirable outcome; however, in investing, selecting a "low-cost" investment is *more likely* to result in a desirable outcome—that is, an investor will meet his or her long-term financial goals. Although investors can't control how the markets behave, they *can* control how much they pay for the market exposure, and this can have a meaningful impact on whether they reach their goals.

4. **Maintain perspective and long-term discipline.** All the planning and execution of an investment strategy is for naught without the discipline to stick with it through the euphoria of bull markets and the fear of bear markets. Psychologically, it's tough to "do nothing" when the world seems to be in such flux, since we endure and thrive as a society by adapting to our dynamic surroundings; however, "sticking to your investment plan" is itself *doing something*, and can make all the difference, because it requires that you maintain your asset allocation through time. This is a key assumption of the planning process: Typically, investors hold a mix of assets with different risk–return characteristics. Over time, the higher risk–higher return asset(s) is likely to become overweight, so "sticking to the plan" means selling outperforming assets to buy assets whose performance has not been as strong. This may seem counterintuitive, and can be hard for investors to do on their own. However, abandoning a well-thought-out financial plan based solely on market performance can cause investors to fall short of their goals. In this respect, working with a financial advisor can add significant value because the advisor acts as a behavioral coach, helping investors to stick to their plans.

Appendix II. Consumer goods and services: Examples of decision-making persistence and durability

As previously discussed, Vanguard's research has identified many areas in which the past is a useful decision-making guide. Similar to the discussion of U.S. colleges earlier, the sampling of categories highlighted next further illustrates the wide range of persistence and durability found in many of life's decisions.

Automobiles. Similar to the *U.S. News & World Report's* college rankings, *Consumer Reports* publishes an annual *Buying Guide* for consumer goods such as appliances, electronics, and automobiles. Although many of the broad categories of goods (and their ranking persistence) change from year to year, especially as the technology marketplace evolves, other categories show fairly convincing evidence of ranking persistence from year to year, particularly in automobiles.

2 For additional details and discussion, see *Vanguard's Principles for Investing Success* (Vanguard, 2014).

For example, **Figure A-1** shows that in the "family sedan" category, eight of the top-ten vehicles from 2005 persisted in the top ten in 2014, and that over the ten-year period from 2005 through 2014, there was a 71% chance that a vehicle in the top ten in any given year would remain there the following year.

Similarly, **Figure A-2**, on page 14, shows that for the "small car" category, six of the top-ten vehicles from 2005 could be found in the top ten in 2014, and over the course of that same ten-year period, there was a 73% chance that a vehicle in the top ten in any given year would remain there in the following year's *Buying Guide*.

Fine dining. The fine-dining area offers numerous rating systems—each similar to that of Morningstar for mutual funds—such as the *Michelin Guide, Forbes Travel Guide*, and *Zagat*. Although each of these guides has different rating systems and evaluation processes, each provides a relative quality ranking of the establishments under review. As an example, we highlight here the New York City *Michelin Guide* ratings. Although these city ratings were launched only recently (first ratings were in 2006), the Michelin Star has long been a hallmark of fine dining around the world. The Michelin evaluations are entirely independent of the restaurants being observed, and they use anonymous inspectors who pay for their own meals and are encouraged to keep their occupation completely confidential even from their families. The reviewers focus primarily on the quality and consistency of the food. After a restaurant is evaluated, it is either awarded a rating up to 3 stars or not rated at all, defined by the *Michelin Guide* as follows:

★★★ Exceptional cuisine, worthy of a special journey
★★ Excellent cooking, worth a detour
★ Very good cooking in its category, a good place to stop on your journey

Figure A-1. Family sedans as rated by *Consumer Reports:* 2005–2014

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
VW Passat	Honda Accord (hy)	Honda Accord	VW Passat	Nissan Altima	Nissan Altima	Nissan Altima	Nissan Altima	Toyota Camry (hy)	Toyota Camry (hy)
Toyota Camry	Toyota Camry	VW Passat	Nissan Altima	Honda Accord	Honda Accord	Honda Accord	Honda Accord	Toyota Camry	Toyota Camry
Honda Accord	Honda Accord	Honda Accord (hy)	Toyota Camry	Toyota Camry	Toyota Camry	Subaru Legacy	Hyundai Sonata	Hyundai Sonata	Honda Accord
Subaru Legacy	Subaru Legacy	Toyota Camry	Toyota Camry (hy)	VW Passat	VW Passat	Toyota Camry	Subaru Legacy	Subaru Legacy	Hyundai Sonata
Nissan Maxima	Nissan Maxima	Toyota Camry (hy)	Kia Optima	Toyota Camry (hy)	Toyota Camry (hy)	VW Passat	Kia Optima	Kia Optima	Chevrolet Malibu
Nissan Altima	Nissan Altima	Ford Fusion	Toyota Camry	Chevrolet Malibu	Ford Fusion (hy)	Toyota Camry (hy)	Ford Fusion (hy)	VW Passat	Subaru Legacy
Mazda6	Mazda6	Mercury Milan	Ford Fusion	Nissan Altima (hy)	Mercury Milan (hy)	Ford Fusion (hy)	Chevrolet Malibu	Mazda6	Ford Fusion (hy)
Chevrolet Malibu	Toyota Prius	Hyundai Sonata	Mercury Milan	Ford Fusion	Hyundai Sonata	Chevrolet Malibu	Mazda6	VW Passat (TDI)	Mazda6
Toyota Prius	Chevrolet Malibu	Subaru Legacy	Hyundai Sonata	Mercury Milan	Chevrolet Malibu	Mazda6	Ford Fusion	Chevrolet Malibu	Nissan Altima
Hyundai Sonata	Mitsubishi Galant	Mazda6	Subaru Legacy	Ford Taurus	Mazda6	Ford Fusion	Toyota Prius	Hyundai Sonata (hy)	VW Passat (TDI)

Sources: Vanguard, based on data from *Consumer Reports, Buying Guide* (2005–2014).

These stars are highly sought-after, since the vast majority of New York City restaurants receive no stars at all. In fact, since the New York City guide's 2006 initial year ratings, only 126 stars have been awarded among the city's thousands of restaurants. **Figure A-3** shows the eight restaurants in New York City that were awarded a 3-star rating over the ten years through 2015. Similar to the college rankings, a clear relationship is seen to exist between the Michelin Star ratings from year to year. A star-"worthy" restaurant in one year can reasonably be expected to receive a favorable star rating the next year. Three of the four restaurants that received 3 stars in 2006 received 3 stars in each year through 2015; the fourth lost its rating in 2007 because it closed and relocated. This is unlike the asset-class and fund-performance rankings discussed in the text, which are affected by the cyclicality of the markets, return factors, and manager styles.

Heart surgeons. Use of star ratings has been extended into areas such as health care, with the ranking of cardiac-surgical groups; this is a more recent development, however, so conclusions are still preliminary. Starting in 2011, the Society of Thoracic Surgeons (STS), in conjunction with *Consumer Reports*, began producing a 3-star ranking system for cardiac-surgical groups. The STS is a nonprofit organization representing more than 7,000 cardiothoracic surgeons, researchers, and other health care professionals making up the cardiothoracic surgery teams. The stated mission of the STS is "to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy."

To that end, in 1989 an STS National Database was created to improve the quality of care and patient safety. Today, the database is considered "the world's premier clinical registry

Figure A-2. Small cars as rated by *Consumer Reports*: 2005–2014

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mazda3	Ford Focus	Honda Civic	Honda Civic	Hyundai Elantra	Hyundai Elantra	Hyundai Elantra	Hyundai Elantra	Subaru Impreza	Subaru Impreza
Ford Focus	Mazda3	Ford Focus	Mazda3	Honda Civic	Honda Civic	Honda Civic	Nissan Sentra	Hyundai Elantra	Kia Forte
Honda Civic	Toyota Prius	VW Jetta (TDI)	Honda Civic (hy)	Mazda3	Honda Civic (hy)	Nissan Sentra	Toyota Corolla	Mazda3	Hyundai Elantra
Toyota Prius	Toyota Corolla	VW Jetta	VW Jetta	Subaru Impreza	Subaru Impreza	Honda Civic (hy)	Kia Forte	Ford Focus	VW Jetta (hy)
Honda Civic (hy)	Hyundai Elantra	Honda Civic (hy)	Hyundai Elantra	Toyota Corolla	Toyota Corolla	Subaru Impreza	Mazda3	Chevrolet Cruze	Ford Focus
Toyota Corolla	Kia Spectra	Mazda3	Toyota Prius	Hyundai Elantra	Mazda3	Toyota Corolla	Chevrolet Cruze	Toyota Corolla	Chevrolet Cruze
VW Jetta	Subaru Impreza	Toyota Prius	Toyota Corolla	Ford Focus	Hyundai Elantra	Mazda3	VW Jetta (TDI)	Kia Forte	Honda Civic
Hyundai Elantra	Scion xB	Toyota Corolla	Mitsubishi Lancer	Kia Rio	Ford Focus	Hyundai Elantra	Ford Focus	VW Jetta (TDI)	Chevrolet Cruze (TD)
Kia Spectra	Suzuki Aerio	Subaru Impreza	Nissan Sentra	Hyundai Accent	Suzuki SX4	Kia Forte	Suzuki SX4	Honda Civic (hy)	VW Jetta (TDI)
Subaru Impreza	Chevrolet Cobalt	Kia Spectra	Kia Spectra	Mitsubishi Lancer	Mitsubishi Lancer	Suzuki SX4	Honda Civic (hy)	Honda Civic	Honda Civic (hy)

Sources: Vanguard, based on data from *Consumer Reports*, *Buying Guide* (2005–2014).

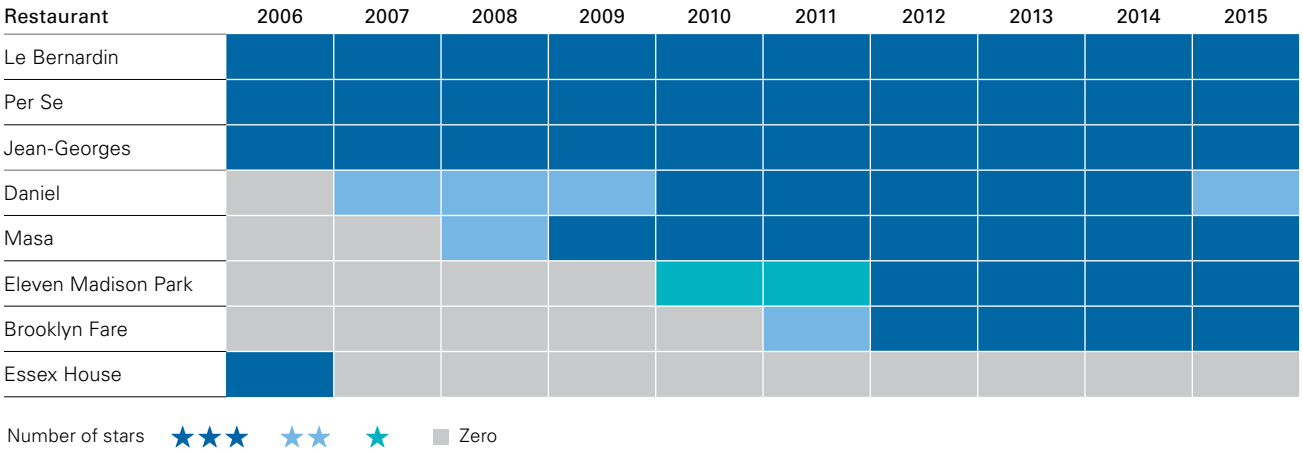
for cardiac surgery; it houses more than 5.7 million surgical records and gathers information from more than 90% of the groups that perform cardiac surgery in the United States"(Society of Thoracic Surgeons, 2015). According to Alex Zapolanski, M.D., director of the cardiac surgery program at Cleveland's Valley Medical Group, "The three-star rating conferred by the STS, a society of heart surgery specialists, is widely regarded by clinicians as the gold standard by which to evaluate cardiac surgery programs."[3]

To provide star ratings, *Consumer Reports* draws on the STS National Database for information on (1) patient survival; (2) absence of surgical complications; (3) use of recommended medications; and (4) use of optimal surgical techniques. For each of these categories, each cardiac-surgical group's performance is compared with the average performance of all consenting groups in the database. Each cardiac-surgical group is then rated as follows:

★★★ Above-average
★★ Average
★ Below-average

As mentioned, the ratings have only been available since 2011; however, based on the extensive training and knowledge needed to perform these surgeries, one would expect a strong relationship between past and future results. This has been the case for the limited data available at this time.

Figure A-3. Michelin Star ratings for New York City restaurants: 2006–2015



Note: In this table, for all but the Essex House restaurant, a "0" star rating indicates that a restaurant was reviewed but received no stars; in the case of the Essex House, the restaurant closed and relocated, so the "0" star rating means it was not reviewed.

Sources: Vanguard, based on data from *Michelin Guides* (2006–2015).

3 Quoted in "STS Three-Star Rating," 2016; available at http://valleyheartandvascular.com/Cardiac-Surgery/STS-Three-Star-Rating.

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