The value of advice: Improving portfolio diversification

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- Improved diversification is just one measure of portfolio value in our three-part value framework for advice, which includes portfolio, financial, and emotional outcomes. Financial advice can improve portfolio diversification.

- Cognitive or behavioral biases, as well as a lack of financial literacy, can lead many individual investors to make common portfolio construction errors. These include taking an undisciplined approach to risk-taking, holding too much cash, or concentrating assets in domestic securities.

- In evaluating the behavior of self-directed Vanguard investors who switched to Vanguard Personal Advisor Service—a service combining human and algorithmic elements to provide advice—we find that for two-thirds of them, advice materially altered equity risk-taking.

- Advice also reduced large cash holdings for nearly three in ten investors, eliminated home bias for over 90% of them, and reduced or eliminated idiosyncratic risk from holding individual stocks.

Introduction

For many nonprofessional investors, constructing a well-diversified portfolio is a challenging task. Instruments like mutual funds and exchange-traded funds (ETFs) can help these investors diversify across a particular set of securities and minimize single-stock risk—but investors' behavioral or cognitive bias or lack of investment literacy can still hinder their efforts to diversify. For example, investors may misperceive the risk and return characteristics of various asset classes or they may lack knowledge of appropriate portfolio construction techniques. Moreover, their decision-making may be affected by inertia, overconfidence, and other biases.[1] These behaviors result in known diversification problems, including uninvested cash, home bias tilts, or a large exposure to single-stock risk.

In this paper, we consider how financial advice can improve portfolio diversification patterns among a sample of self-directed investors at Vanguard who enrolled in Vanguard's Personal Advisor Services (PAS). Here, we detail the diversification analysis touched on in our previous paper, which presented a three-part framework for assessing the value of advice.[2]

The value framework

To emphasize a point from that earlier paper, *Assessing the Value of Advice* (Pagliaro and Utkus, 2019): We believe that the question of "value for money" for advised investors must be evaluated along three distinct dimensions (see **Figure 1**).

Figure 1. Value of advice framework

Component	Description
Portfolio value	Optimal portfolio construction and client risk-taking • Portfolio risk/return characteristics • Tax efficiency • Fees • Rebalancing and trading activity
Financial value	Attainment of financial goals • Saving and spending behavior • Debt levels • Retirement planning: cash flow, income, and health costs • Insurance and risk management • Legacy/bequest/estate planning
Emotional value	Financial peace of mind • Trust—in advisor and markets • Success and sense of accomplishment • Behavioral coaching • Confidence

Source: Vanguard, 2019.

1 See Lusardi and Mitchell (2014), Calvet, Campbell, and Sodini (2007), Barber and Odean (2011), and Beshears et al. (2018).

2 See Pagliaro and Utkus (2019) for our summary paper on the value of advice. See also Pagliaro and Utkus (2018) for related work assessing the impact of managed account advice in defined contribution plans.

Portfolio value. The first dimension concerns the portfolio designed for the investor. Value comes from building a well-diversified portfolio that generates better after-tax risk-adjusted returns net of all fees, suitably matched to the investor's risk tolerance. Portfolio value can be quantified in many ways, including different measures of portfolio risk-adjusted returns, diversification and allocation metrics (such as active/passive share), the impact of taxes, and portfolio fees.

Financial value. The second dimension assesses an investor's ability to achieve a desired goal. A portfolio does not stand on its own. It is in service to one or more financial goals, such as retirement, growth of wealth, bequests, education funding, and liquidity reserves.

Emotional value. The third dimension is an emotional one: financial well-being or peace of mind. The value of advice cannot be assessed by purely quantitative measures. It also has a subjective or qualitative aspect based on the investor's emotional relationship with the advisor (or, in the case of robo-advisors, with the institution and its brand). Underlying elements include trust (in the institution or advisor), the investor's own sense of confidence, the investor's perception of success or accomplishment in financial affairs, and the nature of behavioral coaching such as hand-holding during periods of market volatility.

In this paper, we illustrate the first dimension of value, portfolio outcomes, using one metric: the change in portfolio diversification patterns.

Vanguard Personal Advisor Services

Vanguard's advisory service is goals-based, providing ongoing management of assets and personalized investment portfolio recommendations centered on low-cost index and active mutual funds and ETFs. Introduced in the U.S. in 2014, PAS combines algorithmic and human elements for an advisory fee of 0.30% of assets or less.[3]

To begin, the service profiles investors based on their financial objectives, risk tolerance, investment horizon, and demographic and wealth characteristics. They receive a proposed financial plan that includes a cash flow forecast, the probability of successfully achieving their stated goals (such as financing a secure retirement), and a recommended portfolio strategy that takes into account their goals, risk tolerance, and time horizon.[4] At several points, investors engage with an advisor who explains the plan and may adjust it (within various guardrails) based on feedback.

Once the plan is accepted, investors are enrolled in PAS. From that point, trading occurs automatically to bring the portfolio in line with the desired allocation. Advisors continue to engage with investors on various elements of the plan over time. These ongoing conversations encompass a wide range of investment and financial planning topics, from college savings to tax-efficient portfolio management to retirement income optimization.

Methodology

To study the impact of advice on portfolio diversification patterns, we examined the portfolios of previously self-directed Vanguard investors who enrolled in PAS between 2014 and 2018. Their enrollment allowed us to examine how financial advice may enhance portfolio diversification decisions among self-directed investors generally.[5]

The study sample consisted of more than 44,000 investors. They had a median age of 64 and a median Vanguard tenure of 15 years. The median wealth held in the service was in the range of $250,000 to $500,000.

To ensure that we captured the actual portfolio changes, we examined individual investor portfolios six months before and six months after adoption of the service, and we only considered enrolled investors for whom we could observe portfolio attributes in both periods.[6] Portfolio allocations after advice recommendations include only advised assets.

3 Fees are 0.30% for assets less than $5 million and follow a declining schedule above this threshold.

4 PAS portfolio recommendations are based on a number of factors, including an investor's goals, risk tolerance, and time horizon, and include strategies to cover a range of saving and distribution objectives over various time horizons.

5 It should be noted that self-directed investors at Vanguard are a unique population. Many were likely attracted to Vanguard in the first place by our emphasis on strategic portfolio allocation, low fees, and buy-and-hold investing versus tactical allocation and active trading. Our sample is also affected by self-selection: Some Vanguard investors may be more prone to seek advice than others.

6 We only consider portfolio assets managed by Vanguard. Individuals with assets at other financial institutions prior to adopting advice are not included in this study.

Addressing equity risk-taking

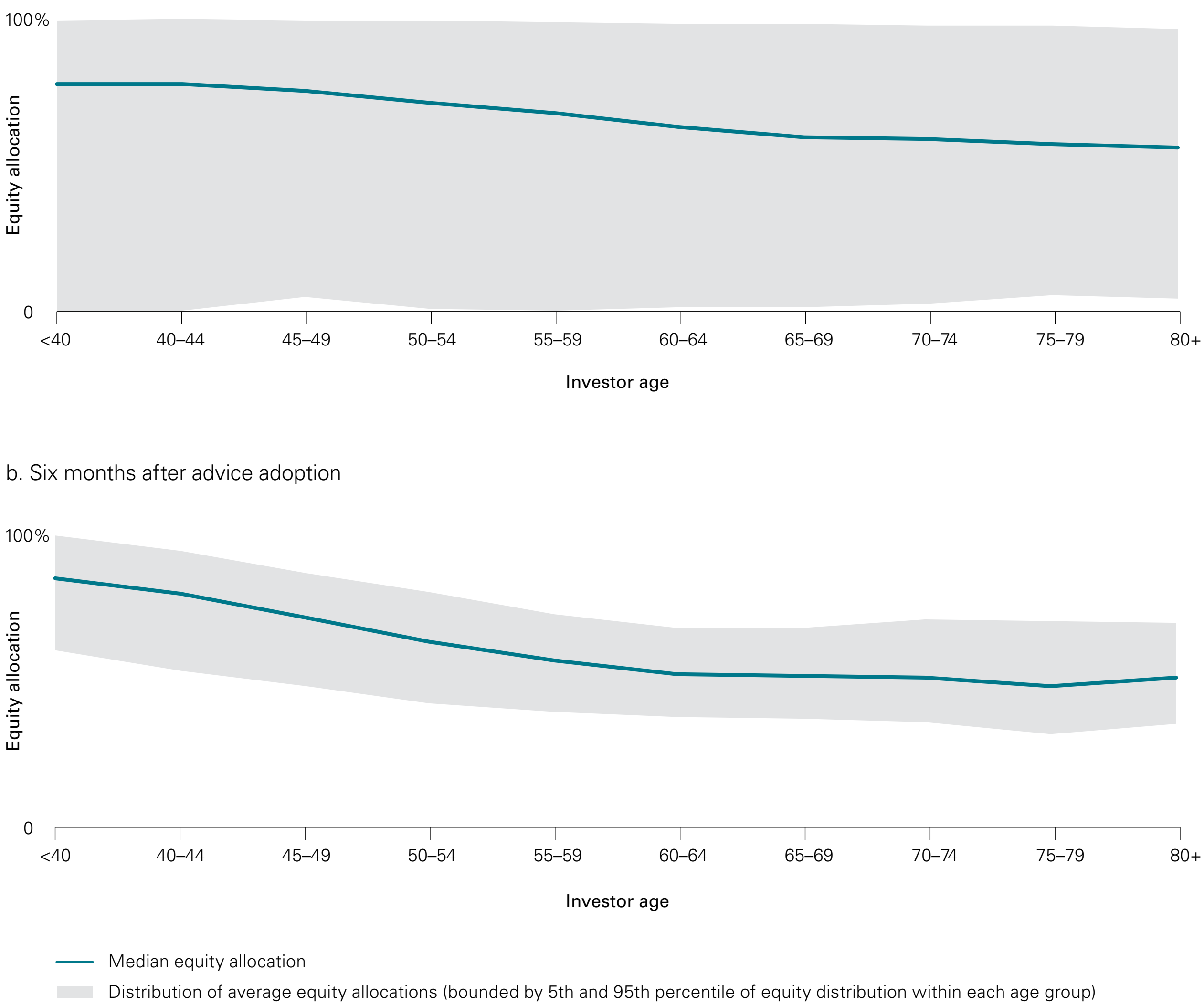
Equity risk-taking is the most fundamental decision an investor makes when constructing a portfolio. A good way to assess the impact of advice on bias-driven equity decisions is to compare age-related equity allocations of self-directed investors before and after service adoption. This view reveals clear differences between self-directed investors' allocations and those made using a professional portfolio management strategy.

Bias-driven choices are evident from the distribution of equity among self-directed investors (see **Figure 2a**). Before the adoption of advice, the distribution of average equity allocations varied widely within all age groups. This lack of a disciplined approach to equity allocation appears to be common among nonprofessional investors; it is, for example, also observed among investors who make their own portfolio choices in defined contribution plans.[7]

Figure 2. Equity allocation by age, before and after investors' adoption of advice

a. Six months before advice adoption

b. Six months after advice adoption



Source: Vanguard, 2019.

7 See Figure 95 in *How America Saves* 2019.

After advice adoption, the distribution or variation of equity allocations narrowed significantly, encompassing a series of professionally designed glidepaths (**Figure 2b**). This evidence suggests that many self-directed investors are inattentive to equity risk-taking levels, with widespread uncertainty about appropriate levels of risk-taking relative to financial goals. Advice helps eliminate this bias in decision-making.

Figure 3 highlights the degree of the equity changes made as well as the resulting allocations. Of the investors in our sample, 31% required only minor changes and 39% required either material or large changes in their level of equity risk-taking. The remainder required a substantial change, increasing or decreasing their allocation by at least 30 percentage points.

Prior to advice adoption, as noted earlier, the distribution of average equity allocation was quite dispersed. After advice adoption, equity risk-taking followed a disciplined professional standard, and we saw a substantial reduction in variation across investors. The distribution of equity allocation after advice reflects this more disciplined approach; as Figure 3 shows, more than two-thirds of the post-advice portfolios had equity allocations of 40%–69%. Professional advice is based on close tailoring of risk levels to investor goals, risk tolerance, and time horizon. With this tailoring comes a more attentive or intentional approach to equity risk-taking than investors might take on their own.

Figure 3. Advice affects equity allocations

Changes needed to be made to investors' equity allocations… / …that caused their equity allocation to shift to…	For **31%,** of investors, the changes were **minor** (+/– 0 to 9 percentage points)	For **24%,** of investors, the changes were **material** (+/– 10 to 19 percentage points)	For **15%,** of investors, the changes were **large** (+/– 20 to 29 percentage points)	For **30%,** of investors, the changes were **substantial** (+/– 30 or more percentage points)	Distribution of equity allocations after advice adoption
Less than 40%	1%	1%	1%	2%	6%
40–49%	4%	5%	2%	5%	16%
50–59%	8%	7%	4%	9%	29%
60–69%	7%	4%	4%	7%	22%
70–79%	3%	2%	2%	2%	10%
Greater than 80%	7%	4%	2%	4%	17%

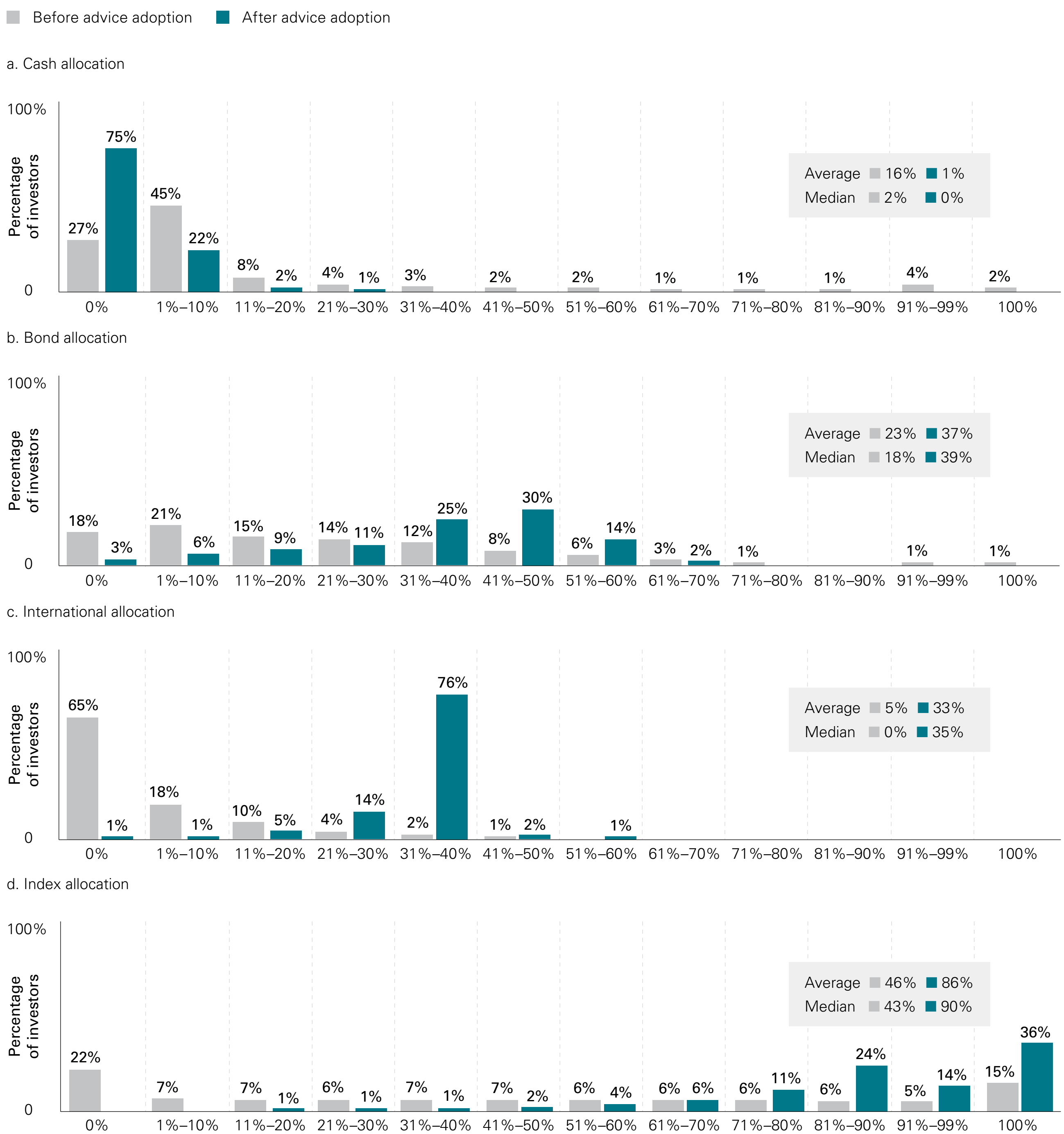
Note: Because of rounding, figures may not add up to totals shown.
Source: Vanguard, 2019.

Other portfolio allocation attributes

Advice has a significant impact on the allocation of other portfolio attributes as well. Certain groups of investors hold excessive levels of cash. While large cash holdings may reflect individual levels of risk aversion, we also regard excessive levels of cash holdings as a measure of procrastination in portfolio implementation or a sign of a lack of literacy about fixed income investments.

Before advice adoption, three in ten investors held cash positions of more than 10% of portfolio assets, while 11% held cash positions of more than 50% (see **Figure 4a**). After advice adoption, these cash positions were reduced, with most of the monies reallocated to bonds. The average bond allocation increased from 23% to 37% of the portfolio (**Figure 4b**).

Figure 4. Advice affects other portfolio metrics



Source: Vanguard, 2019.

A common trait across nearly all investors in our study was home bias. Home bias precludes investors from reaping the benefits of global diversification. Prior to advice adoption, 83% of investors held 10% or less of their portfolio in international investments (**Figure 4c**). After advice adoption, the median international allocation increased to 35% from 0%.

In keeping with PAS's investment methodology, the index or passive share increased, reducing exposure to active funds (**Figure 4d**). Average index allocation nearly doubled, to 86%. This shift significantly reduced investors' active risk exposure.[8]

Before enrolling in PAS, a small but significant group of investors—18% of the total sample—held a substantial portion of their portfolio in individual stocks (see **Figure 5**). Among this group, more than half held over 10% of their portfolio in individual stocks; a smaller percentage concentrated at least half of their assets in individual securities (**Figure 5a**). To better distribute the risk associated with holding such positions, PAS typically suggests investors eliminate them. After advice adoption, individual stock holdings were eliminated for nearly all investors (**Figure 5b**).

Figure 5. Advice affects individual stock allocations

a. In our sample, a total of 18% had individual stock allocations

18%	82%

The breakdown is as follows...

Percentage of investors	Individual stock allocation
82%	0%
8%	1–10%
8%	11%–50%
2%	More than 50%

b. The percentage dropped to 6% after advice allocation

6%	94%

The breakdown is as follows...

Percentage of investors	Individual stock allocation
94%	0%
5%	1–10%
1%	11%–50%
0%	More than 50%

Source: Vanguard, 2019.

8 In general, PAS will recommend an indexed approach to achieve appropriate equity exposure. However, an allocation to active funds may be allowed to an investor requesting one, if the investor indicates that they understand the risks and tax implications of such a strategy.

Managed versus non-managed assets

One caveat to these results is that during enrollment in PAS, investors are able to designate assets that are to be excluded from professional management. Investors may choose to exclude assets for a variety of reasons. Retirement assets may be tied to an employer-sponsored plan; individual stocks or specific actively managed funds may be held for personal or sentimental reasons; cash assets may be held for liquidity purposes. Regardless of the reason for exclusion, investors do have the option to request these assets be included in cash flow projections. One third of investors in the sample chose to exclude assets (see **Figure 6a**). In aggregate, 22% of these assets were held in individual stocks; another 22% were in money market funds, typically designated as emergency savings (**Figure 6b**). The majority of remaining assets were invested in a variety of active and passively managed funds.

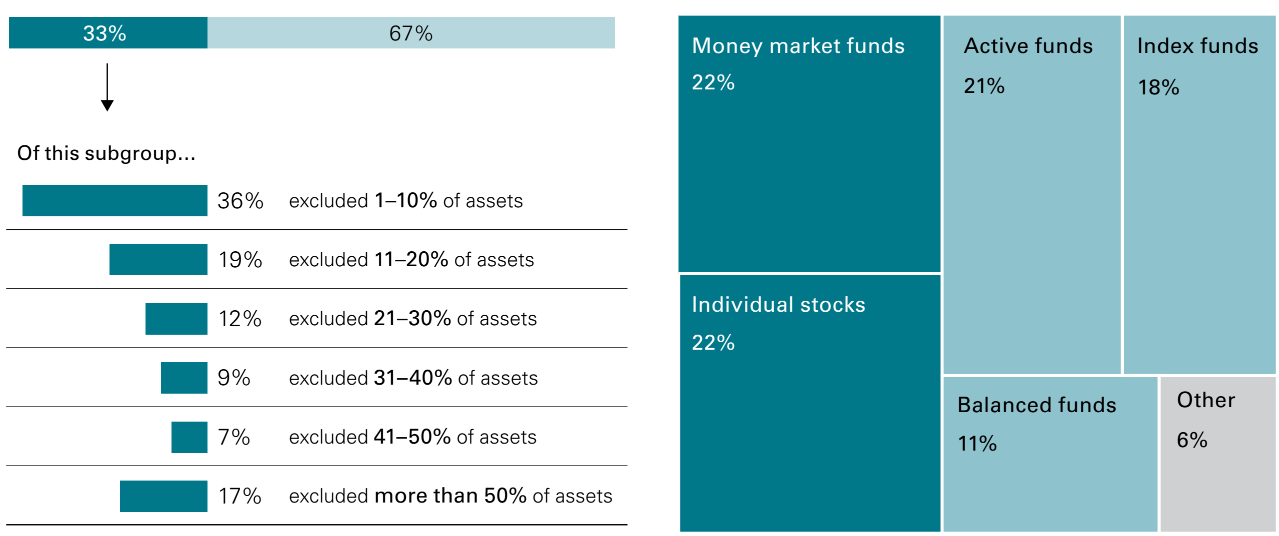
Impact at the individual investor level

To better understand the impact of portfolio diversification at the individual investor level, we used a statistical clustering technique.[9] In addition to demographic factors, we clustered investors by their self-directed portfolio choices as well as the portfolio changes made by the

Figure 6. Managed versus non-managed assets

a. In our sample, 33% of investors chose to exclude some of their assets from management

b. Allocation of excluded assets in aggregate



Note: This analysis considers only assets held at Vanguard and administered by Vanguard.
Source: Vanguard, 2019.

9 Cluster analysis is a statistical technique used to group items based on a measure of commonality among various factors.

advisory service. The results highlight five distinct investor clusters, each illustrating specific financial literacy or behavioral biases common among self-directed investors (see **Figure 7**).

Of the five investor clusters, only "on-target" investors had portfolios that needed no significant changes. These investors represented 11% of the sample. For "aggressive risk-takers" (42%), advice reduced equity exposure while increasing international and passive exposure. Another 28% were "cautious risk-takers"; for them, advice increased equity risk-taking and led to changes in their index and international allocations. A small (5%) but significant group, "stock investors," took on too much single-stock risk, keeping nearly half of their assets in individual stocks. The remaining 14%, "cash-dwellers," held high levels of cash.

Figure 7. Five advised investor clusters

Self-directed Vanguard investors adopting advice

Investor attributes		Portfolio allocation: Before	Portfolio allocation: After	Difference
On-target *11% of clients*	Equity	72%	64%	▼ –8%
	Bond	24%	34%	10% ▲
	Cash	4%	2%	▼ –2%
	International	27%	31%	4% ▲
	Individual stocks	1%	0%	▼ –1%
	Index	51%	86%	35% ▲
Aggressive risk-takers *42% of clients*	Equity	80%	62%	▼ –18%
	Bond	14%	36%	22% ▲
	Cash	6%	2%	▼ –4%
	International	2%	33%	31% ▲
	Individual stocks	1%	0%	▼ –1%
	Index	51%	86%	35% ▲
Cautious risk-takers *28% of clients*	Equity	46%	59%	13% ▲
	Bond	49%	40%	▼ –9%
	Cash	5%	1%	▼ –4%
	International	2%	33%	31% ▲
	Individual stocks	1%	0%	▼ –1%
	Index	51%	86%	35% ▲
Stock investors *5% of clients*	Equity	76%	62%	▼ –14%
	Bond	12%	37%	25% ▲
	Cash	12%	1%	▼ –11%
	International	2%	33%	31% ▲
	Individual stocks	49%	2%	▼ –47%
	Index	13%	84%	71% ▲
Cash-dwellers *14% of clients*	Equity	15%	60%	45% ▲
	Bond	8%	38%	30% ▲
	Cash	77%	2%	▼ –75%
	International	1%	34%	33% ▲
	Individual stocks	2%	1%	▼ –1%
	Index	7%	88%	81% ▲

Note: Account characteristics are median values.

Source: Vanguard, 2019.

Summary and implications

The value of advice should be measured by its impact on portfolio, financial, and emotional outcomes. In this paper, we explored how financial advice improved portfolio diversification patterns in a sample of self-directed investors switching to advice. Advice appears to remedy common portfolio errors attributable to cognitive or behavioral biases or a lack of financial literacy.

We found that the benefits of advice include: a disciplined approach to equity risk-taking; the elimination of large cash holdings; the elimination of home bias; a disciplined approach to active/passive share; and the reduction or elimination of individual stock risk (at least for the managed portion of the investor's assets). In these ways, financial advice can help improve portfolio outcomes for nonprofessional investors.

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