



Vanguard[®]

Most Vanguard IRA[®] investors shot par by staying the course: 2008–2012

Vanguard research

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Executive summary. In a recent study, Vanguard analyzed the personal performance of 58,168 self-directed Vanguard IRA[®] investors over the five years ended December 31, 2012. Because it is problematic to draw conclusions based on personal rates of return alone, these investors' returns were then compared to the hypothetical results of two Vanguard-created "personal rate-of-return benchmarks" for the same five-year period. These benchmarks consisted of, first, an investment in a Vanguard-recommended "policy asset allocation" of stock and bond index funds and, second, one of the Vanguard Target Retirement Funds. Most investors held their own against these benchmarks, although a majority trailed their Target Retirement Fund benchmark slightly. However, investors who exchanged money between funds or into other funds fared considerably worse. The resulting performance gap is a good reminder that a simple, broad-based investment solution can minimize the chances that an investor will make a mistake that can reduce returns.

Author
Stephen M. Weber, CFP[®]

The five-year period from the end of 2007 through December 31, 2012, was one of extremes in the markets. In the United States, it started with the financial crisis and closed with solid equity performance. By the end of 2012, U.S. stocks and U.S. bonds were both posting modest positive five-year returns, while international stocks had a small negative return. To find out whether self-directed Vanguard investors captured the returns available during this period, we conducted a study that calculated the personal returns for more than 58,000 IRA account holders. Given the difficulty of drawing conclusions based on personal rates of return alone, we also created “personal rate-of-return benchmarks” for each account and compared the relative results for each. Our findings showed that most investors “stayed the course” and earned returns commensurate with the calculated benchmarks over the five years. However, those who were more “hands-on” with their investments had a much greater tendency to miss out on potential returns.

This paper details our study results—both for those who stayed with their investment plans and those who strayed. Vanguard recommends that, considering the increasing importance of IRAs for many investors’ retirement security, IRA investors should review whether their current strategies are suited to their time horizons and investing temperaments, even through turbulent markets.

An important caveat: All returns are time-period-specific

This paper’s study examined returns for a specific five-year period, 2008–2012. The results are dependent on the market conditions prevailing during that period, including a large U.S. stock market correction following the financial crisis of 2008–2009 and a negative equity premium relative to bonds for both U.S. and non-U.S. stocks.

Results for future periods can be expected to differ in both magnitude and direction; this time period’s underperformance relative to the benchmarks used could easily turn into another period’s outperformance.

All returns are not created equal

The most widely used metric for measuring investment performance is total return, also known as time-weighted return. Total returns—the returns commonly reported for mutual funds and their benchmarks—measure the percentage change in the value of a portfolio’s investment over a specific time period, including any dividends or capital gains. Total returns are net of all fees and expenses, including fund expense ratios, transaction costs at the account or fund level, and any other account fees. In other words, total return represents the result of investing \$1 over a given period of time, net of all fees.

Notes about risk and performance data: Investments in Target Retirement Funds are subject to the risks of their underlying funds. The year in the fund name refers to the approximate year (the target date) when an investor in the fund would retire and leave the workforce. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. An investment in a Target Retirement Fund is not guaranteed at any time, including on or after the target date. Investments are subject to market risk, including the possible loss of the money you invest. Past performance is no guarantee of future returns. Bond funds are subject to the risk that an issuer will fail to make payments on time, and that bond prices will decline because of rising interest rates or negative perceptions of an issuer’s ability to make payments. Investments in stocks issued by non-U.S. companies are subject to risks including country/regional risk, which is the chance that political upheaval, financial troubles, or natural disasters will adversely affect the value of securities issued by companies in foreign countries or regions; and currency risk, which is the chance that the value of a foreign investment, measured in U.S. dollars, will decrease because of unfavorable changes in currency exchange rates. These risks are especially high in emerging markets. Note that hypothetical illustrations are not exact representations of any particular investment, as you cannot invest directly in an index or fund-group average.

Few investors end up receiving their exact total return over the full investing period, however, because they move money in and out of the portfolios over time. As a result, much of the money in a portfolio does not actually receive the entire period's total return. This difference can be accounted for by using another measure: personal rate of return, also known as investor return, dollar-weighted return, or internal rate of return. The personal rate of return is the rate that, assuming it stayed the same for the entire period, would have produced the investor's final balance given the original balance and cash-flow patterns. The personal rate of return may be either higher or lower than the total return in any given period.

Although personal returns may be a better gauge of an investor's actual experience, they are extremely difficult for an investor to compare and evaluate, for lack of existing "personal-return benchmarks." Comparing personal returns to total returns is tempting, but ill-advised: They are different measures. Two time-weighted returns from two different portfolios can be accurately examined and compared over a specific time period. On the other hand, comparing those total returns with personal rates of return for the same two portfolios muddles the portfolios' various investment choices together with their cash-flow timing, the order of investment returns, and the volatility of those returns. It's akin to comparing height to weight. Keep in mind, too, that even comparing two personal rates of return to *each other* across portfolios is problematic, because each investment portfolio's cash flows are different.

Personal rate-of-return benchmarks

It's important for investors to know, however, how their investment decisions "stand up to those of the competition." Our current study thus analyzed a large sample of self-directed investors' personal returns for the five years ended 2012 versus hypothetical results using two Vanguard-created "personal rate-of-return benchmarks" based on single-fund alternatives. Usually the term *benchmark* refers to an index that investors can use as a basis for comparing a mutual fund's total return. In this case, however, the term *benchmark* is used in the more generic sense of "something to

measure against," which is needed if we are to make meaningful judgments about personal rates of return.

One of the two personal rate-of-return benchmarks was based on a hypothetical mix of three broad-based Vanguard stock and bond index funds, resulting in 11 different investment alternatives according to the size of the investor's initial equity investment, and the other was based on a Vanguard Target Retirement Fund appropriate to the investor's age. We determined what the ending balance *would have been* for each investor's portfolio had it been invested in either of these two Vanguard-recommended single-fund investment alternatives. This value was then used, along with the portfolio's beginning balance and intervening cash flow amounts, to calculate what the portfolio's personal rate of return would have been. *Instead of comparing personal rates of return, we were thus able to compare across investors the performance of each investor's personal rate of return relative to the result of the corresponding personal rate-of-return benchmark.* In other words, this analysis compares the degree to which each investor in our study sample fell short of or exceeded his or her personal rate-of-return benchmarks. For more specifics on our study approach, see the accompanying box, "Study characteristics," on page 5, and Appendix **Figure A-1**.

How did investors do?

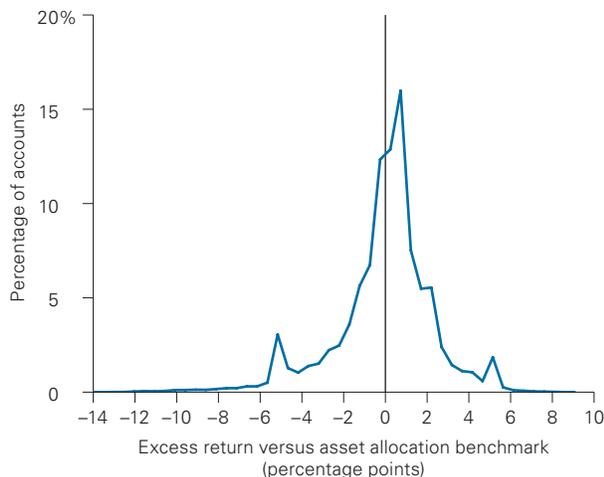
Figure 1, on page 4, plots the underperformance or outperformance of our observed Vanguard IRA accounts relative to the two personal rate-of-return benchmarks.

Against the Vanguard asset allocation benchmark (see **Figure 1a**), investors closely matched their benchmark returns, trailing by a slight margin, on average, and coming in slightly ahead at the median. The Target Retirement Fund benchmark (see **Figure 1b**) was harder to beat over this time period, but the average and median investor return still trailed by only a small margin.

When reviewing these results, it's important to evaluate how well the benchmarks actually applied to specific accounts. For example, the Vanguard asset allocation benchmark graph (Figure 1a) shows a spike between -5 and -5.5 percentage points, and

Figure 1. Personal rates of return versus personal rate-of-return benchmarks, 2008–2012

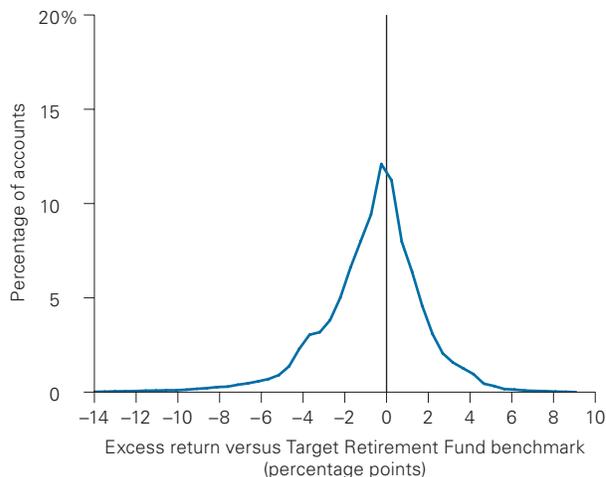
a. Vanguard asset allocation benchmark comparison



Notes: Average excess return, -0.04 percentage points; median excess return, 0.20 percentage points.

Source for Figure 1a and b: Vanguard.

b. Vanguard Target Retirement Fund benchmark comparison



Notes: Average excess return, -0.67 percentage points; median excess return, -0.38 percentage points.

another one between 5 and 5.5 percentage points. In the first case, the difference can be attributed to accounts that were allocated completely to money market funds. During 2008–2012, the return difference between an investment in Vanguard Prime Money Market Fund with no significant transaction activity compared to its corresponding Vanguard asset allocation benchmark (based on a 100% allocation to Vanguard Total Bond Market Index Fund) was -5.1 percentage points; 3.6% of our sample began the period with a portfolio allocated 100% to a money market fund.

The second spike in Figure 1a can be attributed to the popularity of Vanguard Health Care Fund. During 2008–2012, the return difference between an investment in Vanguard Health Care Fund with no significant transaction activity and the Vanguard asset allocation benchmark assigned to it (based on a 70% allocation to Vanguard Total Stock Market Index Fund and a 30% allocation to Vanguard Total International Stock Index Fund) was 5.4 percentage points; 1.3% of our sample maintained a portfolio of 100% Vanguard Health Care Fund for the entire period.

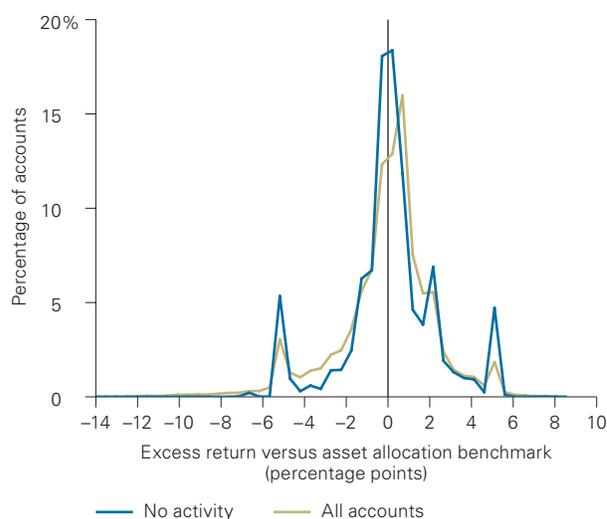
Other differences came into play as well. For example, the benchmark assignment of 30% of the equity allocation to international stocks did not match the allocation of most of the actual investors. The average investor with a stock allocation only allocated about 13% of his or her stock portfolio to international stocks, and 64% of investors with a stock allocation had no international holdings at all. Given that during this period Vanguard Total Stock Market Index Fund outperformed Vanguard Total International Stock Index Fund by 3.7 percentage points annually, this difference clearly gave many investors a substantial head start on their Vanguard asset allocation benchmark. Also, some population of investors always has no interest in keeping a consistent asset allocation, either because of a specific trading strategy or because of the account's role in the context of a larger portfolio. For such investors, a mapping to any static benchmark would probably show performance differences versus the index.

One way to visualize how well the Vanguard benchmarks mapped to the actual investor accounts is to focus the comparison on those Vanguard IRA investors who made no significant transactions

Study characteristics

This analysis calculated the five-year personal average rate of return for a sample of 58,168 Vanguard individual retirement accounts for the period ended December 31, 2012.¹ For each account, we compared the personal rate of return to two different personal rate-of-return benchmarks based on Vanguard “best-practice” investing policy, incorporating the balances and cash flows of each individual account. First, we calculated a personal rate of return for a “Vanguard asset allocation benchmark” based on an investment in one of 11 hypothetical funds potentially combining Investor Shares of Vanguard Total Stock Market Index Fund, Vanguard Total Bond Market Index Fund, and Vanguard Total International Stock Index Fund. These benchmark funds were assumed to have an equity allocation ranging from 0% to 100%, in 10% increments, with 30% of the benchmark’s equity portion allocated to the international stock index fund; depending on the amount of the equity allocation, the remaining balance was invested in the bond index fund. Each IRA was assigned a benchmark based on the equity allocation closest to that account’s equity allocation at the beginning of the period. Next we calculated a personal rate of return based on a hypothetical investment in one of the Vanguard Target Retirement Funds, mapped to each account based on the owner’s age at the beginning of the period.²

Figure 2. Outcomes for accounts with no activity versus Vanguard asset allocation benchmark, 2008–2012



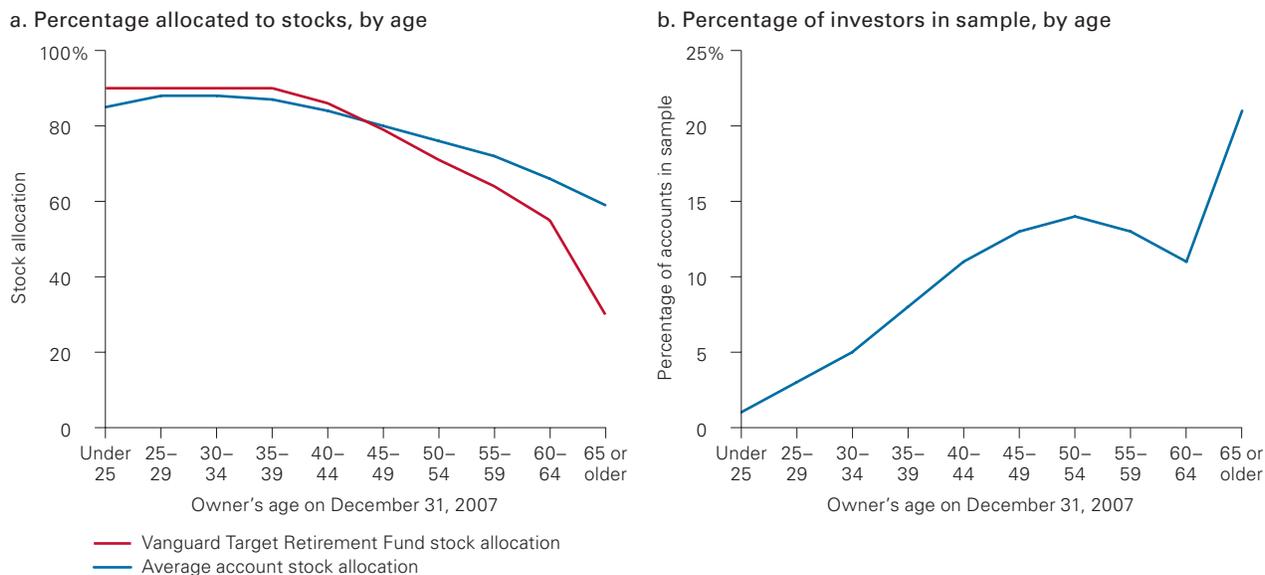
Source: Vanguard.

(contributions, distributions, exchanges, or other transactions) that would influence performance (see **Figure 2**). Ideally, if the self-directed versus “policy allocation” fit were a good one, among this group of investors (about 18% of our overall sample) the values would cluster close to zero. Figure 2 shows the actual differences for this “no activity” group, versus the entire population. The excess returns of the “no activity” group are similar to those of the overall sample. However, a slightly larger group is centered on zero, the spikes discussed earlier are more pronounced, and there is a third spike at about 2% that corresponds to the difference one would expect when comparing the 100% Vanguard stock

1 We started with a random sample of 100,000 traditional, Roth, and rollover IRAs with balances in existence on both December 31, 2007, and December 31, 2012. Accounts of clients using Vanguard Asset Management Services were not included in the sample. This sample was narrowed to 58,380 accounts by removing accounts with fees and those with balances of less than \$10,000 at both the beginning and end of the period. The \$10,000 threshold insulated the study against extreme cases caused by large cash flows relative to the balance—for instance, in the case of investors who redeemed virtually their entire balance except for a token remaining balance. In rare cases, even with these limitations, cash flows would still have caused the hypothetical (\$10,000) balance in the benchmark investment to become negative or to have an extreme value. To avoid these outliers, the accounts with the highest and lowest 0.1% of benchmark differentials for either benchmark were also removed from the sample. This left a remaining sample of 58,168 accounts. As a robustness check, we reran the analysis including accounts under \$10,000. Although extreme values increased as expected, the aggregate distributions remained unchanged. See Appendix Figure A-1 for a breakdown of attributes for the accounts in the sample.

2 Target Retirement Fund benchmarks were assigned based on the account owner’s age as of December 31, 2007. Investors aged 65 or over were assigned Vanguard Target Retirement Income Fund. Otherwise, investors were assigned a Vanguard Target Retirement Fund as follows: the 2010 Fund for ages 60–64; the 2015 Fund for ages 55–59; the 2020 Fund for ages 50–54; the 2025 Fund for ages 45–49; the 2030 Fund for ages 40–44; the 2035 Fund for ages 35–39; the 2040 Fund for ages 30–34; the 2045 Fund for ages 25–29; and the 2050 Fund for ages 24 and under.

Figure 3. Vanguard IRA accounts owned by older investors had a higher equity allocation relative to their mapped Vanguard Target Retirement Funds, and also represented a much larger portion of the sample, 2008–2012



Source: Vanguard.

asset allocation benchmark (containing 30% international stocks) to a 100% domestic equity portfolio. Thus, although the Vanguard asset allocation benchmark measure was clearly not a perfect fit, it appears to have been a good measure.

In contrast to the asset allocation benchmark graph, comparison of Vanguard IRA investors with their Target Retirement Fund benchmarks resulted in a much more regular “bell shape” (as shown in Figure 1b). This was largely because the age of the account owner, not the account’s holdings, dictated the assignment of a benchmark. In this case, return differences due to asset allocation discrepancies dominated differences due to specific investment choices within an asset class, and these differences were more evenly distributed. As a group, investors in this period slightly underperformed their Vanguard Target Retirement Fund benchmarks. Much of that underperformance was probably due to investors’ relative underweighting of bonds versus the Target Retirement Funds, given the negative equity

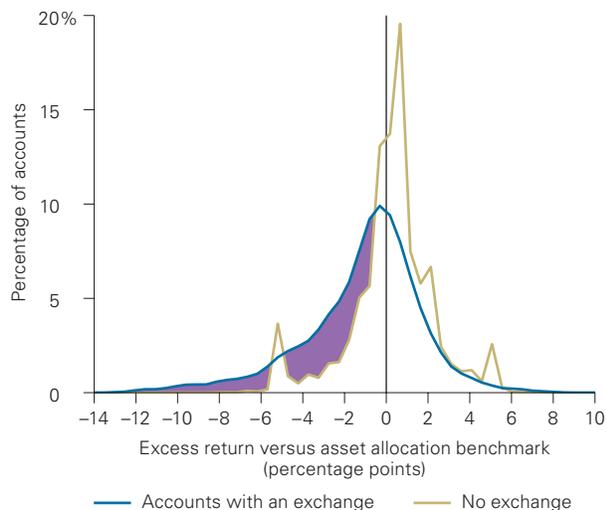
premium of stocks relative to bonds during the time period we studied. **Figure 3** shows the average weighting to stocks (and therefore, by omission, to bonds) for IRA personal return accounts mapped to each Vanguard Target Retirement Fund at the beginning of the period, compared with the fund’s actual stock weighting. Especially among older investors, who were more heavily represented in our sample, bonds were underrepresented relative to the Target Retirement Funds.

Evidence of the ‘loser’s game’

Some of the difference in return between each investor and his or her benchmarks can be attributed to the skill/luck premium embodied in each investor’s choices at the beginning of the period. This is one important component of personal performance. However, another component is perhaps more revealing—the specific decisions made by each investor over the course of the period. Did investors’ actions during this time improve their performance relative to personal benchmarks?

Figure 4. Investors who made investment changes did not perform as well as those that did not, versus the personal rate-of-return benchmarks

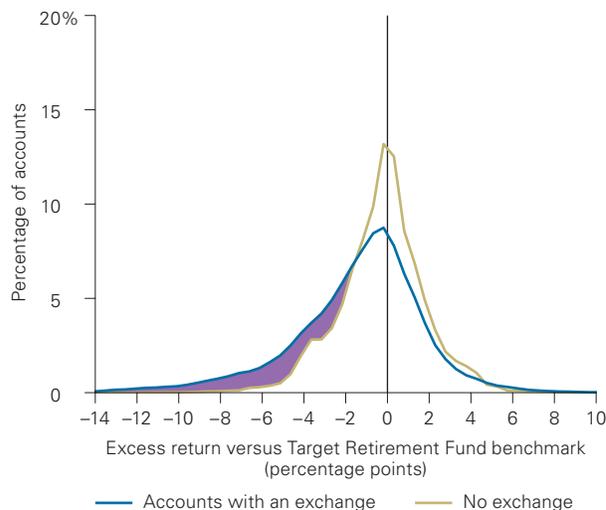
a. Vanguard asset allocation benchmark comparison



Notes: Average value with exchange, -1.04; average value without exchange, 0.33.

Source for Figure 4a and b: Vanguard.

b. Vanguard Target Retirement Fund benchmark comparison



Notes: Average value with exchange, -1.50; average value without exchange, -0.19.

Figure 4 shows that, in the market environment of 2008–2012, a decision to exchange between funds often resulted in reduced returns. The purple area on each graph illustrates the degree of underperformance for accounts with exchanges relative to those that did not make an exchange. Virtually all of the most negative outcomes in our sample corresponded to accounts of investors who were “hands on” with their portfolios. The average investor who made even one exchange over the entire five-year period trailed the Vanguard asset allocation benchmark by 104 basis points annually (100 basis points equal 1%), and trailed the Vanguard Target Retirement Fund benchmark by 150 basis points. On the other hand, investors who refrained from such activity beat the Vanguard asset allocation benchmark by 33 basis points annually and only lagged the Target Retirement benchmark by 19 basis points.

Investment strategist Charles D. Ellis has famously described investing as a “loser’s game.” Drawing analogies to tennis, warfare, gambling, and political campaigning, he demonstrated that the best way to succeed at investing is to avoid errors: “by losing less become the victor” (Ellis, 1975: 22). During the period of our study sample, 2008–2012, it appears that a decision to make an exchange represented more often than not the type of move that Ellis warned against. On the other hand, the absence or presence of contributions and withdrawals did not have a measurable impact on returns relative to the benchmarks.

Conclusion

This analysis compared investor performance in more than 58,000 Vanguard IRAs to two personal rate-of-return benchmarks. For the most part, investors fared reasonably well by choosing low-cost investments and staying the course, even in the midst of a turbulent investment period. However, a subset of accounts did not fare as well: those who “changed course” and exchanged money between funds. Certainly investors who were simply engaging in rebalancing activities between the same existing funds were not making changes that were detrimental relative to the (automatically rebalanced) benchmarks. However, some of the exchanges were surely reactions to market events, and these investors paid a price for failing to maintain portfolio discipline.

Enabling investors to avoid these errors is a key advantage of all-in-one fund portfolios such as broad-based balanced funds and target-date funds. Although popular financial media analysts sometimes deride these investments as being too simple or generic (e.g., Schmansky, 2012), such strategies may actually help to insulate investors from one of the most insidious risks their investment portfolios face: their own behavior. As demonstrated by Vanguard’s hypothetical benchmark options in this analysis, lack of ability by an investor to fine-tune his or her portfolio and respond to market events—especially in times of market turmoil—clearly was not a detriment in the period studied; instead, it was a key positive feature. The majority of investors in our sample who chose to make such adjustments would most likely have been better off in the Vanguard Target Retirement Fund hypothetical alternative during this period. Indeed, even disciplined investors who wisely engage in periodic rebalancing can find their resolve tested by extreme market conditions: How many investors who strayed far from their equity allocation truly had the willpower to rebalance back into stocks at the bottom of the market in early 2009?

Given the growing importance of IRAs in investors’ retirement portfolios, many investors could be well-served to take a good look at what they are trying to achieve in their IRAs and whether their current strategies offer the most promise of meeting their goals. Investors should ask themselves: Is there a good reason not to use a sophisticated single-fund alternative? If the answer is no, perhaps it is time to give up the illusion of “control” in favor of an investment that doesn’t veer from an appropriate path, regardless of market conditions. Alternatively, self-directed IRA investors not invested in all-in-one portfolios who are convinced that their asset allocation is appropriate for their investing goals and time horizon might seek the services of an investment advisor. Such advisors “can act as emotional circuit breakers in bull or bear markets by circumventing their clients’ tendencies to chase returns or run for cover in emotionally charged markets” (Bennyhoff and Kinniry, 2013).

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Figure A-1. Characteristics of Vanguard IRA account sample, 2008–2012

	Percentage of accounts in sample		Percentage of accounts in sample
Number of funds		Percentage of stocks allocated to international as of December 31, 2007	
1	26%	0%	64%
2	29	1%–20%	8
3–5	28	21%–40%	21
6–10	13	41%–60%	3
11 or more	4	61%–80%	1
Number of exchanges		81%–99%	0
0	73	100%	3
1	8	Percentage allocated to money markets as of December 31, 2007	
2	5	0%	67
3–5	6	1%–20%	7
6–10	4	21%–40%	19
11 or more	4	41%–60%	3
Number of contributions and distributions		61%–80%	1
0	42	81%–99%	0
1–2	16	100%	3
3–5	17	Account value as of December 31, 2007	
6 or more	25	\$10,000–\$19,999	25
Type of IRA		\$20,000–\$49,999	37
Traditional	40	\$50,000–\$99,999	18
Roth	32	\$100,000–\$499,999	18
Rollover	28	\$500,000	2
Percentage allocated to stocks as of December 31, 2007		Account owner's age as of December 31, 2007	
0%	8	Under 30	4
1%–20%	2	30–39	13
21%–40%	9	40–49	24
41%–60%	12	50–59	27
61%–80%	13	60–69	20
81%–99%	11	70 or older	12
100%	45	Account owner's gender	
		Male	47
		Female	48
		Not disclosed	5

Notes: "Number of funds" refers to total count of funds owned over the entire five-year period; "Percentage of stocks allocated to international" includes only those accounts with a stock allocation greater than zero.

Source: Vanguard.



P.O. Box 2600
Valley Forge, PA 19482-2600

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