



Vanguard[®]

ETFs: For the better or better?

Vanguard research

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Executive summary. Do exchange-traded funds (ETFs) encourage investors to trade more? As ETFs have increased in popularity, a debate has ensued questioning whether the ability to trade shares intraday is turning long-term investors into short-term traders. If ETFs cause investors to trade more, then ETF ownership could result in increased transaction costs and ill-advised market-timing behavior, both of which might reduce investor returns.

Using a unique dataset of transactions conducted by self-directed, individual investors, we examined more than 3.2 million transactions in more than 500,000 positions held in the mutual fund and ETF share classes of four different Vanguard funds from 2007 through 2011. In general, both ETF and traditional mutual fund shareholders proved to be long-term, buy-and-hold investors. Although behavior in ETFs was more active than behavior in traditional mutual funds in the Vanguard positions we studied, more than 40% of the variation can be explained simply by correcting for differences in personal and account characteristics between ETF and traditional fund shareholders. We conclude that it is not valid to

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assume that the so-called ETF temptation effect explains the higher-observed trading in ETFs relative to mutual funds, nor is it a reason for long-term individual investors to avoid using appropriate ETF investments as part of a diversified investment portfolio.

Exchange-traded funds are increasingly popular among investors.¹ One oft-cited reason for ETFs' popularity is the ability to trade shares throughout the day, a feature not available with traditional mutual funds. Some in the investment community have postulated that investors are hurting themselves by taking advantage of this flexibility and using ETFs for speculative purposes. For example, renowned investor Warren Buffet has cautioned that ETF investors may feel pressured to trade (in Spence, 2007). The CEO of IndexUniverse, Jim Wiandt, recently said, "I think you would be crazy to say that ETFs haven't made index investors more trader-oriented" (in SmartMoney, 2012). And Vanguard's founder and former CEO, John C. Bogle, has remarked both that ETFs are often "just great big gambling, speculative instruments that have definitely destabilized the market" (in Zweig, 2011) and that the trading flexibility aspect of ETFs is "tempting" (in Benz, 2011).

This paper investigates the claim that ETFs "tempt" people to trade.² This issue is of interest because if it is true that ETFs encourage individuals to trade, then these individuals may incur greater transaction costs (such as bid-ask spreads and commissions) than they would otherwise incur as long-term, buy-and-hold investors. Higher transaction costs could result, in aggregate, in lower investment returns. Moreover, prior research has shown that investors who trade frequently may be unsuccessful at correctly timing the market, thus leading to poor investment outcomes (Barber and Odean, 2000).

The presumption that ETFs encourage people to trade is typically based on macro-level trading data. Those who allege that investors are using ETFs to speculate frequently buttress their claims by citing the very large share volumes of a few large ETFs. For example, the share turnover of State Street's SPDR S&P 500 (which represents roughly 10% of ETF assets) exceeds 30% per day, suggesting an

Notes on risk: Past performance is not a guarantee of future results. All investments in mutual funds are subject to risk. Investments in bond funds are subject to interest rate, credit, and inflation risk. Prices of mid- and small-cap stocks often fluctuate more than those of large-company stocks. There are additional risks when investing outside the United States, including the possibility that returns will be hurt by a decline in the value of foreign currencies or by unfavorable developments in a particular country or region. Stocks of companies in emerging markets are generally more risky than stocks of companies in developed countries. Funds that concentrate on a relatively narrow market sector face the risk of higher share-price volatility. Diversification does not ensure a profit or protect against a loss in a declining market.

1 According to Morningstar, U.S.-listed ETF assets grew from \$59 billion as of December 31, 2000, to more than \$1.2 trillion as of March 31, 2012.

2 This paper looks at ETF and mutual fund trading behavior among a set of individual investors. While we believe that relative trading behavior of financial advisors whose end-clients are individual investors is likely to be consistent with these results, we look forward to gaining access to and analyzing other datasets in future research.

average holding period of only three days.³ However, such high-level data are often dominated by the trading and hedging activity of large institutional investors and consider transaction activity at the fund level as opposed to the investor level. Consequently, the data do not reveal much about the behavior of individual investors and their financial advisors.⁴

Thus, to evaluate the claim that ETFs encourage individuals to trade, we examined the trading behavior of a large group of individual, retail investors. At Vanguard, we have a unique opportunity to evaluate this claim because Vanguard ETFs® are a share class within the mutual fund structure, making the underlying investment portfolios of our mutual funds and ETFs identical. As a record-keeper, the company can obtain identifying information from the transaction and account records of actual Vanguard clients and compare the trading activity in its ETF and mutual fund share classes.

We can then infer that any difference in trading behavior found between our clients' ETF and mutual fund investments stems from some combination of self-selection effects and characteristics unique to the investment structures, rather than from differences in the underlying portfolios. Because the universe of mutual fund investors differs from that of ETF investors, we can adjust for some self-selection effects by identifying a variety of investor-specific and account-specific characteristics. The resulting difference in trading behavior provides us with an estimate of the ETF-specific "temptation effect."

Our research attempts to disentangle the trading-behavior differences among individual investors to determine whether ETF and traditional mutual fund

shares are traded differently by the same group of individuals. As such, we focus primarily on the *relative* trading activity between the two vehicles, as opposed to *absolute* trading activity. Absolute activity figures may vary depending on the firm at which investors are located as well as the specific investments themselves. For example, Vanguard clients may be more or less likely to display buy-and-hold behavior than investors at other firms. Similarly, investors might be more active in investments that focus on narrow market segments or alternative asset classes. However, because we are focusing on *relative* trading differences between share classes, we can interpret our findings more broadly and universally. In fact, Vanguard's measures to discourage frequent trading of its mutual funds⁵ may actually inspire more *relative* trading of ETFs than in the industry as a whole, because short-term investors looking to reduce transaction costs may prefer the ETF to avoid additional short-term trading fees and purchase restrictions.

Analyzing ETF versus fund trading behavior

We began with a dataset composed of every transaction (excluding dividend reinvestments) that added or removed shares from a Vanguard retail investment position over the five-year period from 2007 through 2011, in either the mutual fund or ETF share classes of four different Vanguard funds. The funds included Vanguard Total Stock Market Index Fund, Vanguard Total Bond Market Index Fund, Vanguard Emerging Markets Stock Index Fund, and Vanguard REIT Index Fund. The funds were selected because they are large, well-established funds and had a significant number of investors in each share class for the full period under examination.⁶

3 Source: Morningstar, Inc. In contrast, Vanguard S&P 500 ETF has share turnover of less than 2% per day.

4 Morningstar used surveys (IndexUniverse, 2012) to gauge individual investor behavior and found much less tendency to speculate than is suggested by these aggregate numbers.

5 Generally, mutual fund investors at Vanguard cannot purchase traditional mutual fund shares of the same fund within two months of a sale and may face purchase or redemption fees on some funds. None of these constraints applies for ETF share classes of Vanguard funds.

6 Ultimately, as we discussed earlier, the choice of funds is not very relevant, since we are interested in the differences due to share-class structure, not the differences between investment types. In this study, choice of investment did not have a large impact on additional relative trading of ETF shares.

Key terminology

Investment reversal. A change in investment direction (the first buy after selling or the first sell after buying).

Buy-and-hold investment. An investment that is owned over the course of more than one year and experiences no more than two investment reversals in any rolling one-year period.

Hands-on investment. An investment owned over the course of more than one year that experiences more than two investment reversals in any one-year period.

Short-term investment. An investment that is entirely sold within a year.

We subsequently applied a number of filters to this dataset. For example, we removed trusts, joint accounts, and other registration types that could be directly influenced by people other than the main owner of the investment account, leaving us with a sample that included traditional IRAs, Roth IRAs, and individually owned taxable investment positions. We also removed all accounts that were opened before 2007 (the start of our transaction dataset). After all adjustments were made, our final dataset included 36,146 ETF and 507,326 mutual fund positions, across 381,236 unique investors—a sample that includes over 3.2 million specific transactions.

To facilitate analysis of the data, we assigned each investment position to one of three mutually exclusive categories: buy-and-hold investment,

hands-on investment, or short-term investment (see the accompanying box). These categories are based on a combination of an investment's holding period and a count of its "investment reversals," or changes in investment direction.

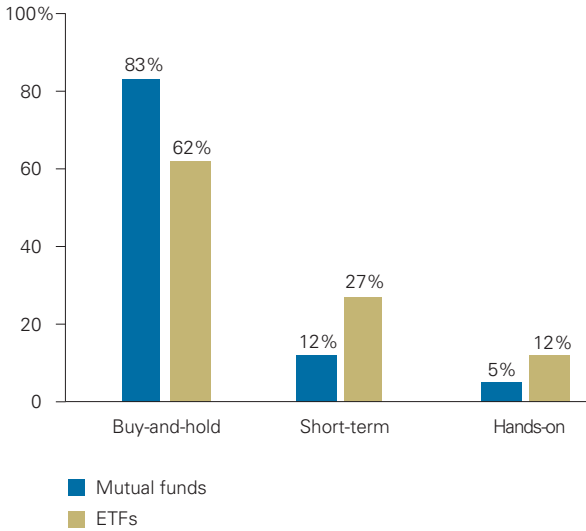
We defined an investment reversal as the first buy after a previous sell transaction or the first sell after a previous buy transaction.⁷ We considered this activity a measure of an investor's change in attitude toward an investment. It's important to note that an investment reversal is not necessarily synonymous with a complete liquidation of the position balance. Any change in direction, regardless of the amount, would indicate a reversal.

We defined a "buy-and-hold" investment as one that is owned over the course of more than one year and experiences *no more than two* investment reversals during any rolling one-year (252-business-day) period. We considered two reversals to be a reasonable threshold because an investor engaging in normal rebalancing behavior could easily experience two reversals in a year. Also, by specifying a maximum amount in a rolling one-year period rather than an average yearly rate, we made a conservative choice to ensure that a brief period of high activity would not be masked by longer periods of inactivity.

We defined a "hands-on" investment as one that is owned over the course of more than one year and experiences *more than two* reversals during at least one rolling 12-month period. We defined a "short-term" investment as any investment that is completely liquidated in one year (252 business days) or less.

⁷ Since automatic investment plans and automatic withdrawals do not represent conscious, active investor decisions, we did not consider them buys or sells for determining investment reversals. This decision proved to be inconsequential to our analysis, since including them had only a tiny impact on the mutual fund results and no impact on the ETF result (given that ETFs do not allow for automatic transactions).

Figure 1. The majority of our ETF and mutual fund investments exhibit buy-and-hold behavior

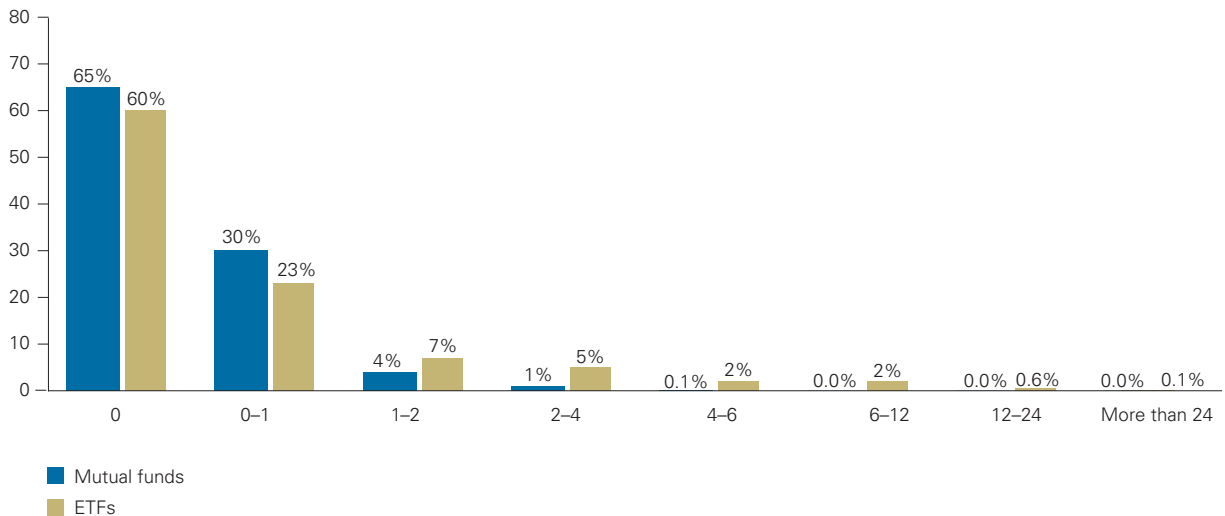


Source: Vanguard.

**ETF and fund trading:
Not as different as they might appear**

As shown in **Figure 1**, the majority of both traditional mutual fund and ETF investments in our dataset are categorized as buy-and-hold investments (83% and 62%, respectively). This result appears contrary to conjectures in the media that most ETF investors are trading ETFs for speculative purposes. In fact, we found little evidence of speculative behavior in either share structure. **Figure 2** shows a distribution of investments held for longer than one year sorted by the average annual rate of investment reversals. As shown, 99% of traditional mutual fund investments and 95% of ETF investments do not exceed a rate of four reversals per year—which hardly paints an image of a day-trading ETF investor. Moreover, less than 1% of our ETF positions averaged more than one investment reversal per month.⁸

Figure 2. Rate of investment reversals per year for investments held longer than one year



Source: Vanguard.

⁸ Admittedly, we might see much more of this activity if we examined the transaction records of an investment company that attracts more active investors or if we analyzed the transaction records of a niche ETF product. However, we would also expect to see a similar increase in activity in a mutual fund with the same investment or firm characteristics.

Figure 3. Key differences between Vanguard ETF® and mutual fund account characteristics

	Mutual fund	ETF
Owner is over age 60.	30%	36%
Owner is female.	39	28
Owner is enrolled in Vanguard Flagship Services® (\$1M+).	14	27
Owner logs on to vanguard.com every day.	16	36
Initial purchase is in 2010.	26	52
Investment is in Vanguard Emerging Markets Stock Index Fund.	23	43
Investment is in Vanguard Total Bond Market Index Fund.	29	10

Source: Vanguard.

An analysis of holding periods tells a similar story. For accounts opened in 2007, we calculated an average holding period of 42 months for mutual fund investments, compared to 34 months for ETFs.⁹ Although the average holding period for ETFs was shorter than for mutual funds, it was still nearly three years.

Nonetheless, a substantial difference in trading activity between our mutual fund investments and ETF investments does exist. As Figure 1 showed, although the majority of investments in both share classes exhibit buy-and-hold behavior, a smaller proportion of our ETF investments (relative to mutual funds) lie in the buy-and-hold category and a greater proportion are classified as short-term or hands-on. What explains this difference? Some of the difference can be attributed to self-selection effects. Self-selection may occur because individuals themselves choose the ETF or the traditional mutual fund; they are not randomly assigned into a share

class. Because investors choose to be in a particular share class, a simple comparison across share classes may not be apples-to-apples.

One might expect that investors who are inclined to trade would be more likely to choose one structure over another. For example, cost-sensitive active traders might prefer traditional mutual funds, owing to the lack of commissions or bid-ask spreads on traditional fund trades. On the other hand, price-conscious active traders might prefer the ETF share class, because of the trading flexibility and intraday pricing that are unavailable with traditional mutual funds. The difference in trading behavior between the two vehicles, then, would not necessarily indicate that the ETF or mutual fund share class is encouraging investors to trade; rather, the share class could simply be serving as a vehicle through which active investors choose to conduct their trades.

The extent to which self-selection may be affecting our dataset can be seen by examining the breakdown of personal and account characteristics between the two vehicles. **Figure 3** highlights some of the most significant differences in the characteristics of the two populations (see Appendix A-1 for a more complete rundown). For example, relative to the mutual fund population, the ETF population has a higher proportion of older, male investors who frequently log onto Vanguard's website to check their balances. Our results clearly indicate that these investors trade more often regardless of whether they invest in the traditional mutual fund or ETF share class. Thus, the ETF in many instances is not causing investors to trade; instead, more active investors are seeking out the ETF as their preferred vehicle.

⁹ Ivcović, Poterba, and Weisbenner (2004) used "holding period to the first sale" for their analysis of tax-motivated trading in individual securities. Our holding period calculation was to the last sale, or December 31, 2011, whichever was earlier.

The difference in trading behavior that we find between our ETF and mutual fund investments is not too surprising because, as Figure 3 shows, we are comparing different types of people in the two vehicles. Another significant indicator of trading proclivity that we discovered is whether or not the investor has a brokerage account. Although all of Vanguard ETF investments are held in a brokerage account (because the ETF share class is a brokerage investment), only about one-third of Vanguard mutual fund investments are owned by investors who also have a brokerage account, and we find that those mutual fund investors with a brokerage account trade their mutual fund shares more often than those without a brokerage relationship. Overall, how much of the observed difference in trading behavior between ETFs and mutual funds can be explained by the differences in population characteristics? To answer this question, we ran a probit regression, which adjusts for the known specific characteristics of each investor and investment.¹⁰

Figure 4 shows the probabilities predicted by our regression model that the average mutual fund investment and the average ETF investment would be buy-and-hold (84% and 62%, respectively), without any adjustment for differences in personal and account characteristics. In other words, without adjusting for population characteristics, our model predicted an ETF investment to be 22 percentage points less likely to be buy-and-hold than a traditional mutual fund. This 22-percentage-point difference closely matches our actual findings from Figure 1.

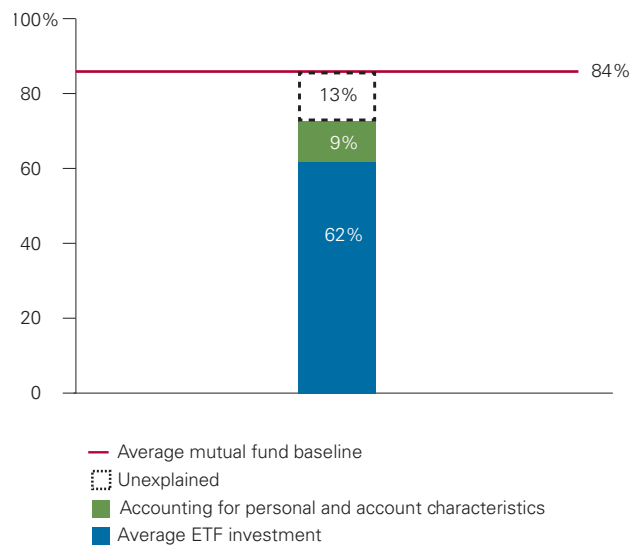
However, when we corrected for differences in personal and account characteristics across the two vehicles (such as age, gender, initial balance, and margin eligibility), the predicted probability that the average ETF investment would exhibit buy-and-hold behavior increased 9 percentage points to 71%. Put

another way, when we assumed that our ETF sample had the same personal and account characteristics as our mutual fund sample, this explained more than 40%¹¹ of the observed trading difference between ETFs and mutual funds.

As shown in Figure 4, accounting for the differences in investment populations explained more than 40% of the observed trading difference between ETFs and mutual funds. We were then left with the remaining 60% of the trading difference, which consisted of three effects:

1. **ETF “temptation effect.”** After the ETF investment has been chosen, investors may increase their tendency to trade in the vehicle because of the availability of intraday pricing and sophisticated trading options.

Figure 4. Impact of differences in a population’s personal characteristics on buy-and-hold probability



Source: Vanguard.

¹⁰ We started with a baseline mutual fund investment with each variable set to the average value of the mutual fund population. For example, instead of defining the baseline user as male or female, we set the gender value to 38.7% female, since 38.7% of mutual fund investments are female. Then we compared the probability of being buy-and-hold for this investment relative to a mutual fund investment whose personal attributes are set to the average value for ETF investments (28.3% of ETF investments are female). This difference in probability reflects the degree to which variations in trading behavior can be explained by differences in personal and account characteristics. We then compared the result for this mutual fund investment (with attributes set to the average value for ETF investors) with results for an ETF investment with the same attributes. This left an amount that cannot be explained by differences in personal and account characteristics.

¹¹ Calculated as: $9 \div 22$.

2. Traditional mutual-fund trading restrictions.

Vanguard has in place frequent-trading policy restrictions on its mutual funds, which generally prevent an investor from buying back into a fund for 60 days after making a sale. Some of the funds also have purchase and/or redemption fees.¹² There are no such limitations on the ETF shares. Some investors who choose the mutual fund share class for one reason or another may have an inclination to trade, but would likely be discouraged from doing so by fees or the frequent-trading policy.

3. Additional and unobserved self-selection effects.

Our regression model cannot completely account for all the relevant investor characteristics that may explain trading behavior. Ultimately, we are most interested in a single self-selection characteristic—the intent to trade. All of the elements examined in our regression model are imperfect predictors of this characteristic.¹³ Additional self-selection variables could either increase or decrease the estimated “temptation effect.” Our research estimated the magnitude of the ETF “temptation effect” among individual investors at Vanguard to be 13 percentage points. Additional data on investor characteristics, if available, would allow us to estimate this effect with even greater precision. The difference of 13 percentage points indicated that a typical ETF investment would be about 15%¹⁴ less likely to be buy-and-hold than a typical mutual fund investment with the same investor characteristics as the ETF.

It’s also worth noting that any difference in trading behavior arising from self-selection and mutual-fund trading policies may, in fact, be good news for investors. Whenever an investor transacts in a traditional mutual fund, the fund manager may need to make corresponding transactions in the underlying portfolio, and the related transaction costs are borne by all shareholders of the fund. Most of the trading done by ETF investors, on the other hand, takes place in the secondary market and therefore does not require transactions at the portfolio level. As a result, a shift in active trading out of traditional mutual funds into ETFs is arguably a benefit for all investors.

Conclusion

Some in the investment community have suggested that ETFs tempt investors to increase their trading activity. Given the lack of investor-level analysis supporting or refuting this presumption, we examined the trading behavior of Vanguard investors. We found that, contrary to speculations in the popular media, most investments are held in a prudent, buy-and-hold manner, regardless of share class. Although behavior in ETFs is more active than behavior in traditional mutual funds, some of that difference is simply due to the fact that investors who are inclined to trade choose ETFs, not that investors who choose ETFs are induced to trade. We conclude that the ETF “temptation effect” is not a significant reason for long-term individual investors to avoid using appropriate ETF investments as part of a diversified investment portfolio.

12 During the period analyzed, the traditional share classes of Vanguard Emerging Markets Stock Index Fund had a purchase fee of 0.5% (0.25% after May 4, 2010) and a redemption fee of 0.25%. The traditional share classes of Vanguard REIT Index Fund had a 1% redemption fee on shares held less than one year.

13 There are modeling techniques that could potentially be employed to correct for sample selection on the basis of unobserved characteristics or to separately model the ETF or mutual fund choice from investor decisions about trading activity. In future research, we plan to further develop our dataset and use such techniques to refine our estimates of the factors that may influence ETF and mutual fund trading.

14 Calculated as $13 \div 84$.

References

Ameriks, John, Karin Peterson LaBarge, and Liqian Ren, 2010. *The Trading Behavior of Vanguard Retail Mutual Fund Investors*. Valley Forge, Pa.: The Vanguard Group.

Barber, Brad M., and Terrance Odean, 2000. Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors. *Journal of Finance* 55(2): 773–806.

Barber, Brad M., and Terrance Odean, 2001. Boys Will Be Boys: Gender, Overconfidence, and Common Stock. *Quarterly Journal of Economics* 116(1): 261–92.

Benz, Christine, 2011. Bogle: Investors Have Tough Time with ETFs. Morningstar, October 11; available at www.morningstar.com.

IndexUniverse.eu Staff, 2012. Cost Is What Matters, Morningstar Survey Shows. IndexUniverse, May 9; available at www.indexuniverse.com.

Ivovic, Zoran, James Poterba, and Scott Weisbenner, 2004. Tax-Motivated Trading by Individual Investors. NBER Working Paper Series No. 10275. Cambridge, Mass.: National Bureau of Economic Research.

Kinnel, Russel, 2010. Bad Timing Eats Away at Investor Returns. Morningstar, February 15; available at www.morningstar.com.

Ludwig, Oliver, 2011. Bogle: ETF Trading Has No Social Value. IndexUniverse, September 29; available at www.indexuniverse.com.

SmartMoney, 2012. Are ETFs Too Dangerous for Most Investors? *Wall Street Journal*, May 14; available at www.smartmoney.com.

Spence, John, 2007. Buffett Gives Nod to Index Funds Over ETFs. *MarketWatch*, May 7; available at www.marketwatch.com.

Zweig, Jason, 2011. Why a Legendary Market Skeptic is Upbeat About Stocks. *Wall Street Journal*, September 10.

Appendix A-I. Differences in study's personal and account characteristics

	Percentage of mutual fund accounts	Percentage of ETF accounts	Difference	Impact on being a buy-and- hold investment
Gender				
Women	38.7%	28.3%	↓10.4	↑1.4
Men	61.3	71.7	↑10.4	—
Age				
Under 50	43.6	38.8	↓4.8	—
50–59	26.4	25.5	↓0.9	↓3.3
60–69	30.0	35.7	↑5.7	↓6.0
Brokerage				
Client has brokerage investments	32.7	100.0	↑67.3	—
Client has Vanguard mutual funds only	67.3	0.0	↓67.3	↑4.9
Client has margin permission	0.5	3.0	↑2.5	↓3.6
Premium service level				
None (< \$100,000 in Vanguard mutual funds and ETFs)	20.3	16.1	↓4.2	↓4.6
Voyager Services® (\$100,000–\$500,000)	50.5	41.0	↓9.5	—
Voyager Select Services® (\$500,000–\$1M)	15.3	16.1	↑0.8	↑2.3
Flagship Services® (\$1M+)	13.9	26.8	↑12.9	↑4.6
Tenure at Vanguard				
Less than 5 years	24.6	22.1	↓2.5	↑2.1
5–10 years	27.2	22.2	↓5.0	↓1.2
10 years or more	48.2	55.7	↑7.5	—
Account type				
Taxable	22.3	34.8	↑12.5	↓0.6
Traditional IRA	51.9	45.1	↓6.8	↓0.1
Roth IRA	25.8	20.1	↓5.7	—
Initial purchase amount				
Less than \$10K	61.4	55.0	↓6.4	—
\$10K–\$50K	26.4	32.9	↑6.5	↓1.2
\$50K–\$100K	5.5	6.9	↑1.4	↓0.7
\$100K or more	6.7	5.2	↓1.5	↓0.2
Log-on frequency				
Never	5.5	1.6	↓3.9	↑5.7
Less than once a month	15.7	4.6	↓11.1	↑8.6
More than once a month, less than daily	62.7	57.8	↓4.9	—
Daily (more than 252 log-ons in the most active calendar year)	16.1	36.0	↑19.9	↓11.5

Notes: In the far-right column, "Impact" is in percentage points, based on a baseline prediction for a specific investor in the 50th percentile of probability to be buy-and-hold (an 83.7% probability). Items with dashes indicate they are part of the baseline profile. Model compensates for each combination of investment and date-of-quarter of initial purchase. All coefficient estimates presented are significantly different from zero at the 99% level, except for the traditional IRA and \$100,000 initial-purchase coefficients, both of which are not significant at the 90% level. An up (down) arrow for "Difference" means that the specified attribute is more (less) prevalent among ETF investments. An up (down) arrow for "Impact" (in far-right column) means that the specified attribute increases (decreases) the likelihood of an investment being classified as buy-and-hold.

Source: Vanguard.



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Vanguard ETF Shares are not redeemable with the issuing fund other than in Creation Unit aggregations. Instead, investors must buy or sell Vanguard ETF Shares in the secondary market with the assistance of a stockbroker. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

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