



Tax-efficient equity investing: Solutions for maximizing after-tax returns

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- Effective tax-efficient investing involves not just identifying and selecting tax-efficient investments but applying a process to structure and maintain an investment portfolio. The tax consequences of investments and strategies should be considered when initially constructing a portfolio and whenever a portfolio change (such as rebalancing) is made.
- Because of the relative cost advantage of broad-market index funds/exchange-traded funds (ETFs) and tax-managed funds over their actively managed counterparts, the historical pre-tax performance of these index and tax-managed funds has been in the top half of their respective style categories; their historical after-tax performance has been, on average, in the top 25% of their respective style categories.
- Whether considering a multiple-share-class ETF, a stand-alone ETF, or a conventional index fund, the primary characteristics to evaluate are benchmark choice, tracking precision, costs, and tax-efficiency. The best way to compare these investments while taking into account all of these characteristics is to evaluate their longer-term after-tax returns.
- So long as cash flow remains positive, broad-market index and tax-managed mutual funds that remain open to cash flow from new investors are likely to be better options than the vast majority of separate-account mandates over long-term holding periods.

Over the long term, tax-wary investors have learned one sure thing: The tax code is never static. Nearly every year, new tax legislation is considered or enacted by the U.S. Congress. The wealth you realize today and tomorrow is dependent on both current and future income tax and capital gains tax rates. Yet, who can foresee what those rates will be 20 or even 10 years from now? The most recent tax-law change in 2013, along with the 2003 cut in the maximum tax rates on qualified dividends and long-term capital gains, has heightened interest in tax-efficient investing.

Manage your portfolio with taxes in mind

Managing the allocations in your portfolio over the long haul is much more important than managing exclusively for taxes. However, awareness of tax-efficiency is integral to managing a portfolio. Vanguard research has shown that, of all the expenses investors pay, taxes can take the biggest bite out of total returns. Most mutual fund managers are not concerned with the tax implications of their trading. One reason for this is that, as a commingled vehicle, a mutual fund most likely has a mix of both

taxable and tax-advantaged investors (i.e., 401(k) and IRA account holders). Therefore, trades focused on tax-efficiency may not benefit all the fund's investors. Domestic stock funds lost about 1 percentage point annually, on average, to taxes over the 15 years through September 30, 2014.¹ Thus, it pays for investors to be sensitive to taxes as they build and monitor their investment portfolios. Effective tax-efficient investing involves not only identifying and selecting tax-efficient investments but applying a process in structuring and maintaining an investment portfolio. The tax consequences of investments and strategies should be considered when initially constructing a portfolio and whenever a portfolio change (such as rebalancing or a cash inflow/outflow) occurs. For instance, an investor may choose highly tax-efficient investments, but if he or she trades those investments regularly, most of the tax benefit may end up being offset by trading costs. By taking advantage of tax-advantaged investment opportunities, organizing your investments within the right types of accounts, and other strategies, you can potentially keep more of your investment returns. The key is to manage a portfolio with taxes in mind.

Notes about risk and performance data. 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. Investments are subject to market risk, including the possible loss of the money you invest. Past performance is no guarantee of future returns. It is possible that tax-managed funds will not meet their objective of being tax-efficient. 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. Prices of mid- and small-cap stocks often fluctuate more than those of large-company stocks. Investments in stocks issued by non-U.S. companies are subject to risk 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.

Although the income from a municipal bond fund is exempt from federal tax, you may owe taxes on any capital gains realized through the fund's trading or through your own redemption of shares. For some investors, a portion of the fund's income may be subject to state and local taxes, as well as to the federal Alternative Minimum Tax.

¹ Sources: Morningstar, Inc., and Vanguard. Average tax cost is calculated based upon Morningstar data for all domestic equity stock funds with 15 years of performance history as of September 30, 2014. Calculations assume account is not liquidated at the end of the period. When after-tax returns are calculated, it is assumed that an investor was in the highest federal marginal income tax bracket at the time of each distribution of income or capital gains. State and local income taxes are not reflected in the calculations. After-tax distributions are reinvested, and all after-tax returns are also adjusted for loads and recurring fees using the maximum front-end load and the appropriate deferred loads or redemption fees for the time period measured. Tax cost = (Before-tax return) – (Preliquidation after-tax return).

Asset location, the allocation of assets between taxable and tax-advantaged accounts, is one tool an investor can use that can add value each year, with an expectation that the benefits will compound through time.² From a tax perspective, optimal portfolio construction minimizes the impact of taxes by holding tax-efficient investments such as broad-market equity index and municipal bond fund investments in taxable accounts and by holding tax-inefficient investments such as taxable bonds in tax-advantaged accounts. This arrangement takes maximum advantage of the yield spread between taxable and municipal bonds, which can generate a higher and more certain return premium.³ Those incremental differences can also have a powerful compounding effect over the long run. Our research has shown that constructing the portfolio in this manner can contribute up to 75 basis points (bps) of additional return in the first year, without increasing risk. For investors or advisors who want to include active strategies—such as actively managed equity funds (or ETFs), REITs, or commodities—these investments should be purchased within tax-advantaged accounts before taxable bonds because of their tax-inefficiency; however, this likely means giving up space within tax-advantaged accounts that would otherwise have been devoted to taxable bonds—thereby giving up the extra return generated by the more certain taxable–municipal spread.

The goal of tax-efficient investing is not necessarily to minimize taxes but to maximize the post-tax total return of a portfolio that meets your particular needs, risk tolerance, and time horizon. You could have an investment that produced a zero return and no tax bill—but it's doubtful you—or any investor—would be happy with that. Tax-efficient investing requires good tax-management practices both by investment managers and by investors themselves.

What determines a tax-efficient investment?

Tax-efficiency can vary greatly among mutual funds/ETFs and separately managed accounts (SMAs). Most mutual funds and separate accounts are managed without regard to taxes, but each vehicle offers specialized tax-management opportunities. Broad-market index funds (and their exchange-traded counterparts) and tax-managed mutual funds,⁴ for example, tend to be very tax-efficient. And SMAs that are established with a tax-management mandate can also be tax-efficient. What determines tax-efficiency? Some relevant factors include investor activity (as mentioned, this involves structuring and maintaining a portfolio with tax-efficiency in mind); a portfolio's management strategy (whether active, broad index, narrow index, growth, value, etc.); and the turnover or trading strategy and accounting methodology used.⁵ Just as some ways of managing investments are more tax-efficient than others, certain types of investments are, by their nature, more tax-efficient than others.

Portfolio strategy and tax-efficiency: The index versus active choice

An index is a group of securities designed to represent a broad market or a portion of the broad market. The index is intended to tell investors what has occurred in a particular market in order to provide a benchmark for performance.

An indexed investment strategy such as a conventional index mutual fund or an index-based ETF aims to track the performance of an index by assembling a portfolio that invests in the same group of securities, or a sampling of the securities, that compose the index. Indexing uses quantitative risk-control techniques to replicate the benchmark's return with minimal expected tracking error (and, by extension, with no expected alpha—or excess return—versus the benchmark). In fact, the best index isn't necessarily the one that provides the highest return, but the one that most accurately measures the performance of the style or market it is intended to track.⁶

² Absent liquidity constraints, wealth-management best practices would dictate maximizing tax-advantaged savings opportunities.

³ The taxable–municipal spread is the difference between the yields on taxable bonds and municipal bonds.

⁴ Tax-managed equity funds are designed to pursue high after-tax returns. Many advisors of such funds combine an index-oriented strategy with sophisticated computer-modeling techniques to help manage risks and portfolio composition. Advisors also implement active tax-loss-harvesting strategies to opportunistically realize losses that may be used to offset future gains. Tax-managed equity funds potentially add a tax-management advantage to a pure indexing strategy.

⁵ These three factors and their impact on tax-efficiency are discussed in Dickson (2003).

⁶ For additional discussion on the indexing investment strategy, see Philips et al. (2014).

Figure 1 shows that 75% of index funds had a lower annual tax cost for the 15 years ended September 30, 2014, than the median tax cost for actively managed funds for the same time period. The figure also shows a 30-basis-point differential in the median tax cost between domestic active and index funds, and a much narrower range in tax cost within the index category. Tax cost represents a very high hurdle for active managers to overcome in addition to management expenses. Some index funds can be tax-inefficient as well. Index funds that fall into the bottom quartile in tax cost track more narrowly focused indexes such as those in the mid- and small-cap markets. Much more broadly based index funds are typically more tax-efficient, because they change their holdings less often.

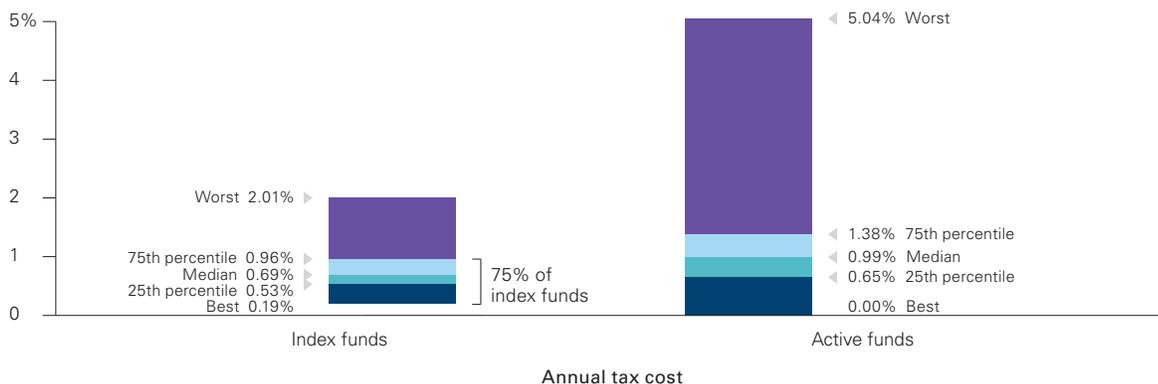
Not all exchange-traded vehicles or conventional index funds are the same. Even funds that track the same index have different performance. Whether considering a multiple-share-class ETF, a stand-alone ETF, or a conventional index fund, the primary characteristics that should be considered are benchmark choice, tracking precision, costs, and tax-efficiency. Although tax-efficiency

attracts major attention, it typically has the smallest impact of all these characteristics when it comes to differences in after-tax performance between these structures.⁷ The best way to compare these investments while taking into account all of these characteristics is to review their longer-term after-tax returns.

ETFs: Structure and tax implications

ETFs are generally index-based funds that trade similarly to stocks.⁸ There are two main differences between ETFs and conventional indexed mutual funds. First, investors buy and sell ETF shares on an exchange, but buy-and-sell transactions of mutual fund shares are done directly with the fund itself. Second, when transacting in ETF shares, investors receive an intraday market price and liquidity similar to individual stocks, whereas when transacting in mutual fund shares, investors receive a price based on the fund's net asset value (NAV). ETFs can also be sold short, bought on margin, or purchased with a limit order or stop order. ETFs furthermore carry very low operating costs that rival, and in some cases beat, the costs of conventional index funds. With these advantages, however,

Figure 1. U.S. stock mutual funds' tax cost: 15 years ended September 30, 2014



Notes: Tax cost = (Before-tax return) – (Preliquidation after-tax return). Number of active funds = 2,050; number of index funds = 130.

Sources: Vanguard calculations, using data from Morningstar, Inc.; calculations assume account is not liquidated at the end of the period. Analysis excludes balanced funds, bear-market funds, long-short funds, and specialty funds. Index funds include ETFs.

7 See Philips (2003) for further discussion of the impact on returns based upon the benchmark used. For a recent study of the range of tracking error experienced by ETFs over a short period of time, see Morgan Stanley (2007).

8 See Dickson and Rowley (2014). Some ETFs also exist based upon an actively managed investment strategy.

come two additional layers of potential costs. First, as with stocks, a purchaser or seller of ETFs must pay a bid-ask spread. Second, it is possible for investors to buy or sell an ETF at a market price above or below the value of the fund's underlying securities. Because ETFs can issue new shares and redeem existing shares, an ETF's market price stays fairly close to the value of the underlying securities.⁹ ETFs structured as stand-alone mutual funds are regulated by the Securities and Exchange Commission (SEC) under the Investment Company Act of 1940 as registered investment companies. They are therefore subject to the same tax laws as conventional indexed mutual funds and multiple-share-class ETFs.

Just as there are structural differences between conventional indexed mutual funds and ETFs, there are structural differences between ETFs. For instance, Vanguard ETFs[®] are organized as separate share classes of Vanguard mutual funds that also offer conventional share classes. This ETF structure, like that of conventional shares, represents part-ownership in the net assets of the underlying index fund. Other ETFs are standalone unit investment trusts (UITs) or open-end management companies.¹⁰ Tax-efficiency is another touted benefit of ETFs, owing to the ability of all ETFs to manage capital gains through in-kind redemptions. Unlike some cash redemptions, in-kind redemptions do not generate capital gains for tax purposes. Moreover, in-kind redemptions can actually reduce embedded capital gains because they allow a fund manager to "push out" the fund's lowest-cost share lots. As this process continues, more of the fund's portfolio is composed of higher-cost shares. This tax-sensitive accounting technique is also available to conventional index funds (Sauter, 2003). Since comparable tax-management strategies are available to conventional index funds and ETFs (regardless of structure), the tax-efficiency of like products may be similar.

Figure 2. Tax-efficiency of selected U.S. broad-market index funds and ETFs

As of September 30, 2014	Five-year tax cost	Ten-year tax cost
Standard & Poor's 500 Index		
Vanguard 500 Index Fund Admiral [™] Shares	0.54%	0.44%
SPDR S&P 500 ETF	0.77	0.54
iShares Core S&P 500 ETF	0.43	0.46
Broad market		
Vanguard Total Stock Market Index Fund Admiral Shares	0.52	0.41
Vanguard Total Stock Market ETF	0.52	0.42
SPDR Russell 3000 ETF	0.69	0.49
iShares Dow Jones U.S. Index	0.39	0.41
iShares Russell 3000 Index	0.41	0.42

Notes: Investors should obtain a prospectus or product description to understand any material differences (if applicable) that may exist between products before they invest. Such things as an investment's objectives, costs and expenses, liquidity, safety, guarantees or insurance, fluctuation of principal or return, and tax features should be carefully considered.

Tax cost = (Before-tax return) – (Preliquidation after-tax return).

Sources: Vanguard calculations, using data from Morningstar, Inc.

Figure 2 shows this similarity in tax-efficiency across a sample of broad-market index and tax-managed funds. The remainder of this paper focuses on conventional index funds and multiple-share-class ETFs, demonstrating their effectiveness as a tax-efficient strategy in addition to the stand-alone ETF structure. We also show how typical broad-market index funds/ETFs or tax-managed funds are likely to be superior to typical actively managed mutual funds or separately managed accounts from an after-tax-return standpoint.

⁹ See Rowley (2013).

¹⁰ Some ETFs are organized as grantor trusts and partnerships. In addition, exchange-traded notes (ETNs), which are not funds but unsecured debt instruments, are sometimes characterized as "ETFs."

Trading strategies: Broad-market index funds versus actively managed funds

Broad-market index funds continually buy and sell securities based on changes in their market indexes or in response to investor cash flows. Since purchases and sales of stock positions within an index fund occur only to adjust for the relative size of the positions within the index, large concentrated purchases and complete liquidations of entire positions are less frequent. Therefore:

- Each day when there is positive net cash flow into a broad-market index fund, the manager may make fractional purchases of many securities within the index. On the other hand, when there is negative net cash flow out of the fund, the manager may make small fractional sales of securities.
- An index mutual fund’s transaction pattern generally means that, over time, the fund accumulates a large number of share lots, with wide dispersion between the low- and high-cost lots.
- Use of tax-sensitive accounting techniques (highest-in, first-out [HIFO] or specific identification accounting of share lots), in combination with this wide dispersion of share lots, can be effective in limiting capital gains distributions resulting from fund redemptions.

This type of transaction pattern differs from the approach of a typical active-fund manager. Based on a belief in a security’s potential to outperform, an active manager is more inclined to make specific concentrated purchases in fewer equities and to liquidate entire holdings more often than would a manager of a broad-market index fund. Therefore:

- Actively managed funds tend to have share lots that are much more concentrated in individual portfolio names and less dispersed in purchase prices when the sale of individual portfolio positions is needed.
- Active managers typically do not make small marginal sales of many individual positions, but will tend to completely eliminate certain holdings that may have lower return expectations relative to the rest of the portfolio.
- In making wholesale liquidations, active managers are much more likely to realize capital gains, since the entire position’s gain would be realized; thus, FIFO accounting techniques play a minimal role in reducing capital gains distributions as a result of fund redemptions (Dickson, 2003).¹¹

Figure 3 summarizes the transaction-pattern differences between index and active strategies.

Figure 3. Transaction-pattern differences between index and active strategies

Index strategy	Active strategy
Buy/sell decision based upon addition/deletion to the index and cash flows.	Buy/sell decision based upon active manager’s investment selection process and cash flows.
Buy/sell small positions over longer time horizon, creating high number of share lots with large price dispersion.	More likely to buy/sell a position over shorter time horizon, resulting in lower number of share lots with a narrow price dispersion.
Accounting techniques are an effective tool in limiting capital gain distributions as a result of fund transactions.	Accounting techniques play minimal role in limiting capital gain distributions as a result of fund transactions.

Source: Vanguard.

¹¹ HIFO (highest in, first out) refers to a tax-sensitive accounting method in which tax lots with the highest cost bases are sold first, thus potentially realizing losses and limiting capital gains.

Figure 4 provides a hypothetical example of how FIFO accounting, combined with the availability of many different share lots, can be an effective tax-management tool. As the figure shows, the creation of new share lots on a more regular basis due to cash inflows allows a passive fund manager to more readily liquidate specific shares when a sale is needed and to generate a capital loss even though the overall stock position maintains an unrealized capital gain.

As noted earlier, however, the choice of share lots is much more limited for an active manager, should he or she choose to make a small fractional sale. This example also highlights that should the entire position be sold—a more common occurrence in actively managed portfolios—FIFO accounting techniques would not be effective, owing to the overall gain in the position that would be realized (\$400, as shown in Figure 4).

Figure 4. FIFO accounting (with widely dispersed tax lots) as effective tax-management tool: Hypothetical example

Date	Number of shares purchased of stock "X"	Stock "X" price	Cost basis	Total basis	Total shares	Portfolio value	Portfolio unrealized gain/loss
January 3	100	\$10	\$1,000	\$1,000	100	\$1,000	\$0
January 4	100	12	1,200	2,200	200	2,400	200
January 5	100	14	1,400	3,600	300	4,200	600
January 6	100	15	1,500	5,100	400	6,000	900
January 7	100	16	1,600	6,700	500	8,000	1,300
January 10	100	14	1,400	8,100	600	8,400	300
January 11	100	13	1,300	9,400	700	9,100	-300
January 12	100	14	1,400	10,800	800	11,200	400

Date	Number of shares sold of stock "X"	Stock "X" price	Total market value of sale
January 21	200	\$14	\$2,800
	Sell 100 shares at cost basis of \$16 per share		1,600
	Sell 100 shares at cost basis of \$15 per share		1,500
	Realized capital loss using FIFO		(\$300)

Notes: This hypothetical illustration does not represent any particular investment. FIFO = highest in, first-out accounting method (see footnote 11).

Source: Vanguard.

Tax-efficiency and competitive pre-tax returns can go together

With stock funds, the size of a fund’s distributions affects its tax-efficiency, of course, but the type of distributions also plays a big role. With the tax-law changes in 2003 and more recent ones in 2013, the difference between the tax rates levied on long- and short-term capital gains grew wider than it had been in years. (*Capital gains* refers both to the gains mutual funds distribute to investors when they earn a profit on the sale of a security and to the gains investors realize when they sell a stock or a bond for more than they paid for it.) Most investors now pay 15% on qualified stock dividends and long-term (longer than one year) capital gains, with the exception being those investors in the 39.6% tax bracket, who pay 20%. However, the tax rate on short-term capital gains can be much higher—up to 39.6%.

As we have shown, broad-market index/ETFs and tax-managed funds are generally tax-efficient because they don’t typically generate a high level of capital gains, short- or long-term. Actively managed stock funds, however, have historically generated a much larger amount of capital gains distributions.

Figure 5 indicates that over the ten years ended December 31, 2014, the five Vanguard broad-market index and tax-managed funds highlighted gave up only a small percentage of their pre-tax returns to taxes.¹²

Figure 5. Tax-cost comparison of selected Vanguard funds

As of December 31, 2014	One-year returns (%)			Five-year returns (%)			Ten-year returns (%)			Expense ratio (%)
	Pre-tax	After-tax	Tax-cost	Pre-tax	After-tax	Tax-cost	Pre-tax	After-tax	Tax-cost	
Vanguard Total Stock Market Index Fund	12.43	11.97	0.46	15.56	15.16	0.40	7.99	7.65	0.34	0.17
Vanguard 500 Index Fund	13.51	13.02	0.49	15.28	14.88	0.40	7.55	7.20	0.35	0.17
Vanguard Total International Stock Index Fund	-4.24	-5.01	0.77	4.32	3.73	0.59	4.79	4.25	0.54	0.22
Vanguard Tax-Managed Capital Appreciation Fund	12.52	12.11	0.41	15.53	15.19	0.34	8.04	7.75	0.29	0.12
Vanguard Tax-Managed Small-Cap Fund	6.23	5.96	0.27	17.25	17.03	0.22	9.06	8.87	0.19	0.12

Notes: Funds highlighted represent Vanguard broad-market equity index and equity tax-managed funds. All fund returns are for Investor Shares, with the exception of the two tax-managed funds, which are Admiral Shares; five- and ten-year returns are annualized.

Tax-cost = (Pre-tax return) – (Preliquidation after-tax return).

Performance data shown represent past performance, which is not a guarantee of future results. Investment returns and principal value will fluctuate, so investors’ shares, when sold, may be worth more or less than their original cost. Current performance may be lower or higher than the performance data cited. For performance data current to the most recent month-end, visit our website at www.vanguard.com/performance.

Source: Vanguard.

12 Standardized reporting of after-tax returns for Vanguard funds in Figure 5 is shown in the Appendix.

Figure 6 further shows that these same funds performed, on average, in or near the top 30% of their category on a pre-tax basis over ten years. Then, when measured on an after-tax basis, these funds outperformed an even greater percentage of their peers. The odds of finding a fund that outperformed these funds were about one in four. Taxes are a high additional cost hurdle for active managers to overcome.¹³

How would one go about determining whether any fund would end up in the top quartile on an after-tax basis? A good place to begin the search would be with funds that minimize cost.

Figure 6. Pre-tax and after-tax percentile ranking of selected Vanguard funds within Morningstar category

		Morningstar category percentile ranking by total returns					
		One-year		Five-year		Ten-year	
Vanguard fund name	Category	Pre-tax	After-tax	Pre-tax	After-tax	Pre-tax	After-tax
Vanguard Total Stock Market Index Fund	Large blend	47 (735/1,572)	31 (488/1,572)	16 (193/1,211)	11 (126/1,211)	17 (138/815)	10 (79/815)
Vanguard 500 Index Fund	Large blend	20 (311/1,572)	13 (207/1,572)	21 (247/1,211)	14 (168/1,211)	29 (235/815)	19 (153/815)
Vanguard Total International Stock Index Fund	Foreign large blend	35 (272/776)	32 (245/776)	62 (382/615)	63 (389/615)	34 (115/337)	28 (93/337)
Vanguard Tax-Managed Capital Appreciation Fund	Large blend	31 (483/1,572)	19 (287/1,572)	13 (154/1,211)	7 (85/1,211)	15 (119/815)	8 (59/815)
Vanguard Tax-Managed Small Cap Fund	Small blend	48 (336/702)	26 (183/702)	16 (90/564)	9 (49/564)	18 (63/353)	9 (31/353)

Notes: Funds highlighted represent Vanguard board-market equity index and equity tax-managed funds. All fund returns in this figure are for Investor Shares, except for the two tax-managed funds, which are Admiral Shares. Numbers in parentheses refer to: fund ranking/total number of funds in Morningstar category.

Performance data shown represent past performance, which is not a guarantee of future results. Investment returns and principal value will fluctuate, so investors' shares, when sold, may be worth more or less than their original cost. Current performance may be lower or higher than the performance data cited. For performance data current to the most recent month-end, visit our website at www.vanguard.com/performance.

Source: Morningstar, Inc. Data as of September 30, 2014.

¹³ The impact of taxes on investment returns is also noted in several studies, including Roseen (2006) and Jeffrey and Arnott (1993).

Controlling cost *does* make a difference

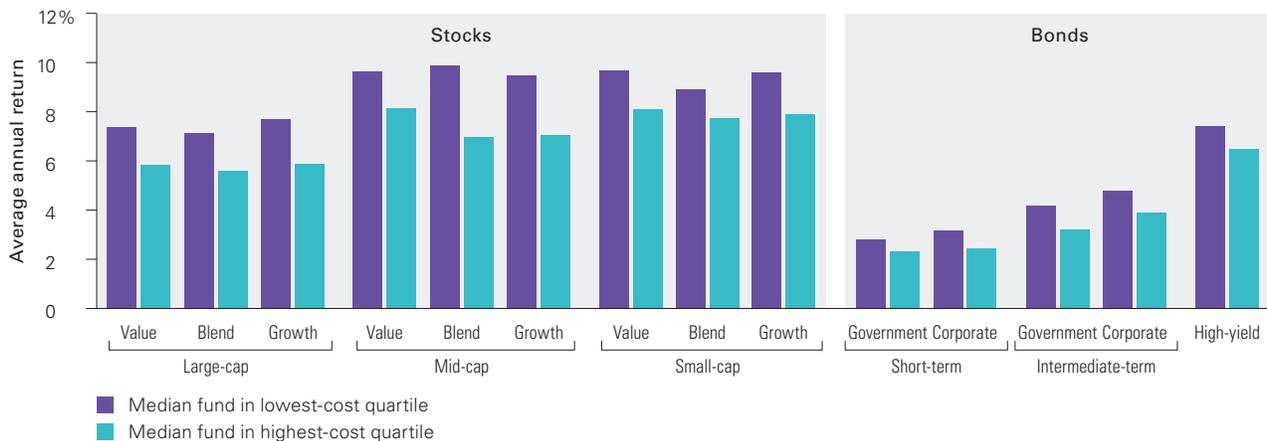
Contrary to the typical economic relationship between price and value, higher costs do not lead to higher returns. Every dollar paid for management fees, trading costs, and taxes is a dollar less of potential return. Unlike market performance and the other elements that determine an investor’s return, however, costs are more predictable and more controllable. Research has repeatedly shown a powerful relationship between low costs and relatively higher returns.¹⁴ **Figure 7** compares the ten-year records of the median fund in two groups: the 25% of funds that had the lowest expense ratios as of year-end 2013 and the 25% that had the highest expense ratios, based on Morningstar data. In every category we evaluated,

the low-cost fund outperformed the high-cost fund. Therefore, for taxable investors, minimizing both investment management costs and taxes is vital to maximizing portfolio returns.

Broad-market index funds/ETFs achieve a performance advantage by employing a low-cost structure. This structure derives from their low management fees and lower turnover relative to their actively managed counterparts. Higher turnover results in greater transaction costs such as commissions, bid–ask spreads, market impact, and opportunity cost.

Figure 7. Comparing performance of low-cost and high-cost funds: Lower costs can support higher returns

Average annual returns over ten years through December 31, 2013



Notes: All mutual funds in each Morningstar category were ranked by their expense ratios as of December 31, 2013. They were then divided into four equal groups, from the lowest-cost to the highest-cost funds. The chart shows the ten-year annualized returns for the median funds in the lowest-cost and highest-cost quartiles. Returns are net of expenses, excluding loads and taxes. Both actively managed and indexed funds are included, as are all share classes with at least ten years of returns.

Sources: Vanguard calculations, using data from Morningstar, Inc.

¹⁴ A number of studies, such as Carhart (1997) and Gruber (1996), have shown that lower-cost investments, on average, have historically outperformed higher-cost investments.

Numerous studies have indicated that indexing has provided performance superior to that of the average actively managed fund on a pre-tax basis over longer periods of time.¹⁵ Figure 8 shows the relative performance of actively managed U.S. equity mutual funds when evaluated against the funds' representative style benchmark over the 15 years through December 31, 2013. The figure highlights results in three areas:

1. The percentage of funds in each category that survived the time period but underperformed their benchmarks and were unadjusted for so-called survivorship bias (that is, the results do not reflect those funds that dropped out over time).

2. The percentage of funds in each category that started the 15-year period but then either underperformed or dropped out of the sample because they were liquidated or merged (thereby accounting for survivorship bias—that is, the practice of removing “dead” funds from a performance database). A total of 2,186 funds did not survive the full 15-year period.
3. The median annualized excess return for funds that survived the 15-year period.

The results show that active fund managers as a group have underperformed their style benchmarks across most of the fund categories considered. It is interesting that one popular criticism of indexing is that it only succeeds in the most “efficient” markets, such as large-capitalization equities. Indexing’s cost advantage, however, enables it to work across all asset classes, despite varying degrees of market efficiency.

Figure 8. Performance of actively managed U.S. equity mutual funds versus a representative ‘style benchmark’

		15 years through December 31, 2013		
		Percentage underperforming		Median surviving fund excess return
Morningstar category		Unadjusted for “survivorship bias”	Adjusted for “survivorship bias”	
U.S. equity	Large blend	56%	81%	-0.26%
	Large growth	39	70	0.48
	Large value	45	76	0.24
	Mid blend	83	92	-1.06
	Mid growth	62	82	-0.66
	Mid value	86	93	-1.52
	Small blend	35	64	0.75
	Small growth	66	83	-0.83
	Small value	36	69	0.72

Notes: A total of 2,186 funds did not survive the full 15-year period. Equity benchmarks are represented by the following indexes—Large blend: MSCI US Prime Market 750 Index through January 30, 2013, CRSP US Large Cap Index thereafter; Large growth: S&P 500/Barra Growth Index through May 16, 2003, MSCI US Prime Market Growth Index through April 16, 2013, CRSP US Large Cap Growth Index thereafter; Large value: S&P 500/Barra Value Index through May 16, 2003, MSCI US Prime Market Value Index through April 16, 2013, CRSP US Large Cap Value Index thereafter; Mid blend: S&P MidCap 400 Index through May 16, 2003, MSCI US Mid Cap 450 Index through January 30, 2013, CRSP US Mid Cap Index thereafter; Mid growth: MSCI US Mid Cap Growth Index through April 16, 2013, CRSP US Mid Cap Growth Index thereafter; Mid value: MSCI US Mid Cap Value Index through April 16, 2013, CRSP US Mid Cap Value Index thereafter; Small blend: Russell 2000 Index through May 16, 2003, MSCI US Small Cap 1750 Index through January 30, 2013, CRSP US Small Cap Index thereafter; Small growth: S&P SmallCap 600/Barra Growth Index through May 16, 2003, MSCI US Small Cap Growth Index through April 16, 2013, CRSP US Small Cap Growth Index thereafter; Small value: S&P SmallCap 600/Barra Value Index through May 16, 2003, MSCI US Small Cap Value Index through April 16, 2013, CRSP US Small Cap Value Index thereafter.

Sources: Vanguard calculations, using data from Morningstar, Inc., MSCI, Standard & Poor’s, and CRSP.

15 See Sharpe (1991), Waring and Siegel (2005), Malkiel (1995), and Ennis and Sebastian (2002).

Broad index funds/multiple-share-class ETFs and tax-managed mutual funds can be highly tax-efficient

To summarize, our research supports the following assertions:

- Because of its cost advantage, indexing can be successful across all asset classes, despite varying degrees of market efficiency.
- A broad-market index mutual fund’s transaction pattern allows the fund, over time, to accumulate a large number of share lots, with wide dispersion between the low- and high-cost share lots.
- The use of tax-sensitive accounting techniques, combined with a wide dispersion of share lots, is an effective tool in limiting capital gains distributions resulting from fund redemptions.
- The tax-efficiency of broad-market index and tax managed funds, relative to that of actively managed mutual funds, further strengthens the benefits of indexing for taxable investors.

Misconceptions about tax-efficiency and conventional indexed mutual funds

Misconception #1. Large capital gains will be realized during a market sell-off

A growing index mutual fund’s tendency to create a wide dispersion of share lots in each security is a powerful defense against the risk that such portfolios will become the tax traps their critics claim them to be. A common misconception is that fund managers will be forced to sell fund holdings, and thus realize substantial capital gains, because investors will tend to redeem their shares during bear markets.

At the height of the late-1990s bull market in equities, Vanguard’s broad-market index funds maintained large unrealized capital gains as a percentage of NAV similar to, if not even higher than, those shown in **Figure 9**. The funds shown in the figure performed very well on an after-tax basis, distributing very low to no capital gains through September 2014.

Figure 9. Examples of cash redemptions under FIFO accounting: As of September 30, 2014

	Break-even redemption* (percentage of fund)			
	Flat market	20% decline	30% decline	Unrealized gains**
Vanguard 500 Index Fund	20%	38%	56%	43%
Vanguard Total Stock Market Index Fund	24	60	89	31
Vanguard Total International Stock Index Fund	100	100	100	8

*Percentage of portfolio that could be redeemed before realization of capital gains.

**Includes accumulated realized losses.

Notes: This hypothetical analysis shows the percentage of a portfolio that could be redeemed in cash before the realization of net capital gains. (Other forms of redemption, such as “in-kind” of securities, do not trigger distributable capital gains to shareholders of the fund). Each scenario assumes the portfolio starts with a net realized capital gain position equal to the previous month’s net accumulated capital gain/loss, which is not necessarily indicative of the portfolio’s actual tax status. Capital gains and losses realized by selling proportional slices of each stock held in the portfolio are then factored into the analysis. Because the analysis assumes highest-cost lots are sold first (consistent with the manner in which Vanguard administers each portfolio’s tax-lot structure), net losses are typically realized from initial sales. Loss realization from successive sales accumulates until subsequent sales realize net capital gains. The analysis continues as the sales registering a gain reduce the accumulated losses until the net position enters gain territory. The table shows the percentage of each fund that can be sold in this fashion before realized net capital gains return to 0%. This analysis is based on each fund’s then-current holdings and tax-lot structure as of September 30, 2014. Actual realization of net capital gains and losses for each fund can be found in the funds’ respective annual reports. The analysis also assumes security prices as of September 30, 2014. Because substantial shareholder redemption activity is normally associated with poor recent performance, results from sensitivity analyses that assume security price declines of 10%, 20%, and 30% are also provided.

Source: Vanguard.

Figure 9 also shows that in the event of a market decline, the funds were in a position to redeem substantial portions of fund assets before realizing any net capital gains. Even in a flat equity market, many of the funds could liquidate a sizable percentage of fund assets before realizing any net capital gains. Should a hypothetical analysis reveal the potential for a broad-market index fund to realize a capital gain due to net cash outflows in a flat or rising equity market, it would be expected that the distribution would still be marginal, relative to the other aspects of longer-term after-tax returns.

When shareholder redemptions result in net cash outflows, the managers can sell share lots that they purchased at high prices and realize losses that can then be used to offset gains elsewhere in the portfolio. A well-managed index fund uses its high-cost share lots to accommodate redemption requests. In reality, redemptions in a bear market can help a broad-market index or tax-managed fund remain tax-efficient.

In fact, capital gains distributions for equity index mutual funds (expressed as a percentage of their average net asset values) decreased during the 2000–2002 and 2008–2009 bear markets, as illustrated in Figure 10.

Figure 10. Average annual capital gain distributions for U.S. equity index funds as percentages of their net asset values, 1993–2013



Notes: Averages calculated using capital gain distributions and NAVs as of year-ends. Data for index funds include ETFs.

Sources: Vanguard calculations, using data from Morningstar, Inc.

As highlighted earlier with respect to Figure 5 (on page 8), a number of Vanguard broad-market index and tax-managed funds remained extremely tax-efficient over the ten-years ended September 30, 2014. This period included both an extraordinary bull market for equities, during which embedded capital gains increased significantly, and an extreme bear market. For the ten years, each of the funds cited in Figure 5 gave up a minimal amount of return annually to taxes (that is, return before taxes minus return after taxes on distributions). In fact, this annual tax cost can be primarily attributed to the taxes that were owed on dividends received from the underlying securities and then distributed to investors.

An index fund’s return is due primarily to its beta exposure; therefore, its absolute return is very close to its relative benchmark return.¹⁶ Considering that many studies have shown that investor cash flows tend to follow past performance, it is less likely that an index fund will experience negative cash flows in a rising or flat equity market.¹⁷

An active manager’s fund return comprises the beta exposure from the market in which the fund participates plus any additional active-management efforts. The effect of active management can be highly additive or dilutive to the beta, or market return. Therefore, an actively managed fund’s absolute return can deviate significantly from its relative benchmark return.

Again, since investors have tended to follow performance, and research has also shown that it is difficult to preselect managers who will consistently be among the top performers,¹⁸ an actively managed fund is much more likely to experience (and some funds *have* experienced) significant negative cash flow, even though the fund’s absolute performance may still be positive. In such an environment, a fund’s historically high tax-efficiency can quickly break down, producing significant capital gains distributions. As a result, although broad index funds’ tax-efficiency has been an enduring characteristic and is expected to continue to be so, little value can be placed on an actively managed fund’s historical tax-efficiency as an indicator of forward-looking tax-efficiency.

¹⁶ *Beta* is a measure of the magnitude of a portfolio’s past share-price fluctuations in relation to the ups and downs of the overall market (or appropriate market index). For further discussion of beta, see Ambrosio (2007) and Phillips et al. (2014).

¹⁷ See Sirri and Tufano (1998) and Gruber (1996).

¹⁸ See Carhart (1997) and Malkiel (1995).

A further risk associated with active management for taxable investors is the potential for a change in manager (Bergstresser and Poterba, 2002). This added risk is important, since a new manager might completely restructure the portfolio, causing realization of capital gains generated from past investment success and tax-efficiency.

If investment performance has been good, equity mutual funds, whether index or active, must have either deferred capital gains distributions, resulting in large embedded capital gains subject to future payout, or they have already distributed the capital gains. Therefore, we can assume that:

- Active funds that historically have displayed tax-efficiency will continue to lose the ability to create losses while at the same time becoming much more concentrated.
- Actively managed funds' tax-efficiency is much less stable. The lack of depth and breadth of share lots provides a scenario for tax-inefficiency in the future.
- If active funds with large embedded capital gains experience a period of positive absolute performance but trail the market or their peers, negative net cash flow could lead (and has led) to capital gains distributions. Therefore, expectations of enduring tax-efficiency for actively managed funds should be viewed with caution.

Misconception #2. Separately managed accounts are more tax-efficient

Tax-efficiency is commonly cited as a benefit of a separately managed account (SMA). Since SMAs provide direct ownership of securities in a portfolio that can produce tax-management benefits, account owners are not subject to taxes generated by the transactions of other investors. Within an SMA, it's possible to distribute net losses, which can result in tax benefits beyond the portfolio.

However, this benefit may have a long-term disadvantage. The realization of capital losses in the present is likely to diminish both tax-efficiency and portfolio diversification in the future because of the "lockup" effect.¹⁹ As markets generally rise over time, the unrealized gain in a portfolio's securities increases; as a result, the SMA manager has fewer opportunities to sell securities without imposing a tax liability on the account owner. This lockup effect thus prevents a manager from making portfolio changes tax-efficiently, while possibly increasing the concentration in the portfolio's securities. Increased capital gains and lowered diversification can result (Donaldson, 2005). The trade-off between the ability to realize losses early on and the potentially higher capital gains realizations and reduced diversification later is a decision that investors must evaluate. The greater the short-term losses being realized within the portfolio, the greater the portfolio tracking error becomes versus the underlying portfolio benchmark.²⁰ It is also important to point out that loss harvesting is primarily a "tax deferral" strategy. As current losses are realized, with positions then reestablished 31 days later to abide by the "wash-sale" rule, a lower cost basis is established in the security. Therefore, a higher tax obligation may be realized in the future on the sale of the security. The current loss-harvesting strategy may then be undermined if capital gains taxes are higher in the future relative to when the loss was realized.

¹⁹ Diminished loss-harvesting opportunities over time, potentially causing portfolio "lockup" and therefore lower tax-efficiency in the future, have also been discussed in various earlier studies (see, for example, Berkin and Ye [2003], Stein and Narasimhan [1999], and Stein and Garland [1998]).

²⁰ See Bouchev (2010).

An SMA represents the assets and cash flows of only one investor. As a consequence, SMAs tend to have fewer share lots for use in a tax-loss-harvesting strategy. Share lots are created by new investment flows into the SMA, by the reinvestment of dividends paid by the underlying holdings, or by trades initiated by the SMA manager. Usually, an SMA's investment cash flows are more concentrated at the inception of the SMA relationship.

Typically, an SMA manager is reluctant to hold cash for any great length of time, and thus is likely to invest it as soon as possible. As a result, the initial allocation of cash creates share lots centered in a very narrow price range. Additional share lots could be created by further cash flows into the SMA from the investor, but the share lots are more apt to result from trades made by the SMA manager. In a tax-sensitive SMA, cash flows can lack depth or breadth when a security is either added for outperformance potential or deleted for loss-harvesting opportunities. This is in contrast to either broad-market index funds or tax-managed funds that are open to new cash flow from other investors whose positive cash flows provide a wide dispersion of share lots in many securities. To maintain diversification, the SMA manager would need to sell highly appreciated securities, thus realizing taxable capital gains.

Thus, ultimately, so long as cash flow remains positive, broad-market index and tax-managed mutual funds open to new cash flow from other investors provide a number of benefits that are absent from a separate account established at a single point in time. These benefits are:

- Dilution of capital gains for fund shareholders.
- An increase in the cost basis of a portfolio's securities over time.
- The opportunity to rebalance the portfolio or invest in new industries with new cash flows.²¹

Basic differences between mutual funds and SMAs

Both equity mutual funds/ETFs and separately managed equity accounts can provide exposure either to the broad stock market or to discrete market segments, but important technical and practical differences exist between the two vehicles. Most of these differences relate to the ownership of the portfolio's underlying securities. **Figure 11** provides a broad comparison of mutual funds versus SMAs.

Figure 11. Mutual funds versus SMAs: Differences in the details

Factor	Mutual funds	Separately managed accounts
Ownership structure	Registered investment company: Ownership share in underlying securities.	Direct ownership of underlying securities.
Portfolio management oversight	Ongoing.	Ongoing.
Adequate diversification at the security level?	Yes, unless fund discloses otherwise.	Only for very large account sizes.
Tax-efficient?	Yes for broad-market index/ETF and tax-managed funds.	Determined by investor.
Investor control over management?	No.	Yes.
Investor control over proxy voting?	No.	Yes.
Investor control over gains and losses?	No on distributions; yes on purchase and sale of fund shares.	Yes.
Portability of underlying securities?	Not usually.	Yes.

Notes: Investors should obtain a prospectus or product description to understand any material differences (if applicable) that may exist between products before they invest. Aspects such as an investment's objectives, costs and expenses, liquidity, safety, guarantees or insurance, fluctuation of principal or return, and tax features should be carefully considered.

Source: Vanguard.

²¹ The benefits of positive cash flow are discussed in detail in Dickson, Shoven, and Sialm (2000) and Dickson (2000).

Conclusion

Over the long term, it is much more important to manage the allocations in your portfolio than to manage exclusively for taxes; nevertheless, your portfolio's tax-efficiency is an integral component to take into account. An investor should seek to build his or her portfolio around the more controllable aspects of investing—asset allocation, costs, and tax-efficiency—and not the ones over which he or she has less control, such as which investments will likely outperform in the future.

For investors looking to maximize after-tax returns, low-cost broad-market index funds/ETFs and tax-managed funds are available and designed specifically to meet this need. Indexing has historically provided higher after-tax returns than have actively managed mutual funds. This is a result of indexing's cost advantages and, for a broad-market index mutual fund, a transaction pattern that allows for accumulation of a large number of tax lots with wide dispersion. In addition, so long as cash flow remains positive, broad-market index and tax-managed mutual funds open to cash flow from other investors are most likely better options for attaining tax-efficient returns close to those of the broad market versus the vast majority of SMAs over longer periods. The potential tax lockups and inefficient tax management that an SMA portfolio can experience over time can be avoided.

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Appendix Figure A-1. After-tax returns and expenses for selected Vanguard funds: As of December 31, 2014

Fund (inception date)	One-year	Five-year	Ten-year	Since inception	Expense ratio
Vanguard 500 Index Fund Investor Shares (8/31/1976)					0.17%
Returns before taxes	13.51%	15.28%	7.55%	11.10%	
Returns after taxes on distributions	13.02	14.88	7.20	—	
Returns after taxes on distributions and sale of fund shares	8.01	12.32	6.12	—	
Vanguard 500 Index Fund Admiral Shares (11/13/2000)					0.05%
Returns before taxes	13.64%	15.42%	7.66%	5.04%	
Returns after taxes on distributions	13.12	14.99	7.29	4.65	
Returns after taxes on distributions and sale of fund shares	8.11	12.44	6.22	4.00	
Vanguard Total Stock Market Index Fund Investor Shares (4/27/1992)					0.17%
Returns before taxes	12.43%	15.56%	7.99%	9.62%	
Returns after taxes on distributions	11.97	15.16	7.65	9.05	
Returns after taxes on distributions and sale of fund shares	7.38	12.55	6.49	8.15	
Vanguard Total Stock Market Index Fund Admiral Shares (11/13/2000)					0.05%
Returns before taxes	12.56%	15.70%	8.10%	5.78%	
Returns after taxes on distributions	12.07	15.28	7.75	5.41	
Returns after taxes on distributions and sale of fund shares	7.48	12.67	6.59	4.65	
Vanguard Total Stock Market ETF* (5/24/2001)					0.05%
Returns before taxes	12.56%	15.70%	8.11%	6.31%	
Returns after taxes on distributions	12.07	15.28	7.75	5.95	
Returns after taxes on distributions and sale of fund shares	7.48	12.67	6.59	5.11	
Vanguard Total International Stock Index Fund Investor Shares(4/29/1996)					0.22%
Returns before taxes	-4.24%	4.32%	4.79%	4.61%	
Returns after taxes on distributions	-5.01	3.73	4.25	4.00	
Returns after taxes on distributions and sale of fund shares	-1.84	3.38	3.85	3.62	
Vanguard Total International Stock Index Fund Admiral Shares (11/29/2010)					0.14%
Returns before taxes	-4.17%	—	—	4.43%	
Returns after taxes on distributions	-4.97	—	—	3.69	
Returns after taxes on distributions and sale of fund shares	-1.79	—	—	3.46	

(Continued on page 19)

Figure A-1. After-tax returns and expenses for selected Vanguard funds: As of December 31, 2014 (continued)

Fund (inception date)	One-year	Five-year	Ten-year	Since inception	Expense ratio
Vanguard Tax-Managed Capital Appreciation Fund Admiral Shares (9/06/1994)					0.12%
Returns before taxes	12.52%	15.53%	8.04%	9.68%	
Returns after taxes on distributions	12.11	15.19	7.75	9.41	
Returns after taxes on distributions and sale of fund shares	7.42	12.56	6.55	8.37	
Vanguard Tax-Managed Small Cap Fund Admiral Shares (3/25/1999)					0.12%
Returns before taxes	6.23%	17.25%	9.06%	11.07%	
Returns after taxes on distributions	5.96	17.03	8.87	10.87	
Returns after taxes on distributions and sale of fund shares	3.71	14.01	7.43	9.50	

Notes:

a. Five- and ten-year returns are annualized.

b. After-tax returns are calculated using the highest individual federal income tax rates in effect at the time of each distribution. They do not reflect the impact of state and local taxes. Your after-tax return depends on your individual tax situation and may differ from the return presented here. If you own fund shares in a tax-deferred account such as an individual retirement account or 401(k) plan, this information does not apply to your investment, because these accounts are not subject to current taxes. After-tax returns for Vanguard funds reflect the reduced tax rates on ordinary income, qualified dividend income, and short-term and long-term capital gains that went into effect in 2003. After-tax returns for most funds are calculated using the tax liability implied by each fund's declared distributions. However, the exact tax characteristics of many distributions are not known until after the close of the calendar year. If a fund incurs a loss, which generates a tax benefit, the postliquidation after-tax return may exceed the fund's other return figures.

Performance data shown represent past performance, which is not a guarantee of future results. Investment returns and principal value will fluctuate, so investors' shares, when sold, may be worth more or less than their original cost. Current performance may be lower or higher than the performance data cited. For performance data current to the most recent month-end, visit our website at www.vanguard.com/performance.

* U.S. Patent Nos. 6,879,964; 7,337,138; 7,720,749; 7,925,573; 8,090,646; and 8,417,623.

Source: Vanguard.

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