



Vanguard®

Vanguard asset allocation ETFs: A simple yet sophisticated approach to portfolio construction

Vanguard Research

August 2018

Todd Schlanger, CFA, Scott J. Donaldson, CFA, and Maria Grant

- This paper explores the investment methodology of the Vanguard asset allocation ETFs that are designed specifically for Canadian investors.
- The asset allocation ETFs are simple to understand, yet provide investors with a sophisticated approach to portfolio construction built on our investment principles (goals, balance, costs, and discipline) and our core research on strategic asset allocation, global diversification, and passive implementation.
- These single-ticket portfolios provide embedded discipline and can help with the operational complexity of executing an asset allocation strategy, freeing up time that can be spent elsewhere.

This document is published by The Vanguard Group, Inc., the indirect parent company of Vanguard Investments Canada Inc. It is for educational purposes only and is not a recommendation or solicitation to buy or sell any security, including any security of any investment fund. The information is not investment advice, nor is it tailored to the needs or circumstances of any particular investor. Research published by The Vanguard Group, Inc., may not be specific to the context of the Canadian market and may contain data and analysis specific to non-Canadian markets and products.

Introduction

Canadian investors are increasingly choosing exchange-traded funds (ETFs) to implement their asset allocation strategies, favouring the lower cost, transparency and liquidity of the vehicle. According to Strategic Insight, Canadian assets under management in ETFs eclipsed \$147 billion as of December 31, 2017, and have grown at an annual rate of 22% relative to 10% for mutual funds since 2010.

Canadian investors have also been increasingly adopting embedded advice, solution-oriented products packaged in fund-of-funds structures. These 'wrap programs' have grown at an annual rate of 23% relative to stand-alone funds at 8% over the same period (from 2010 to 2017). Currently, it is estimated that there are 184 wrap programs with a total of 1,348 distinct balanced portfolios approaching \$600 billion of the \$1.4 trillion (42%) of the Canadian mutual fund industry's assets under management as of December 31, 2017. Yet, very few wrap programs are available in an ETF structure.

In the first quarter of 2018, Vanguard launched a suite of three asset allocation ETFs designed specifically for Canadian investors. These multi-asset portfolios are simple to understand, yet provide investors with a sophisticated approach to portfolio construction built on our investment principles (goals, balance, costs and

discipline) and our core research on strategic asset allocation, global diversification and passive implementation.

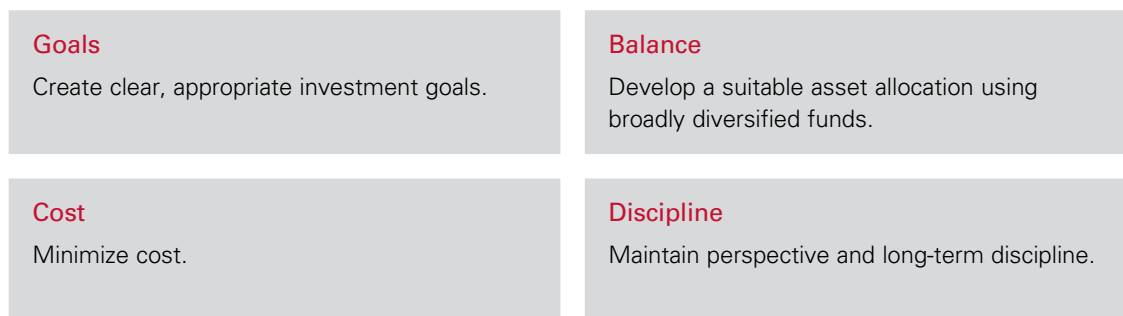
They also provide embedded discipline that can help with the operational complexity and administrative burden of executing an asset allocation strategy. This is relevant for advisors because, based on our research, the value proposition for advisors of the future will need to be more focused on the uniquely human aspects of the advisor-client relationship, such as relationship management and behavioural coaching (Bennyhoff, 2017).

In this paper, we will explore the investment methodology that underlines the Vanguard asset allocation ETFs and highlight how their construction relates to our investment principles and core research.

Vanguard's investment principles and experience with multi-asset solutions

Across the markets and geographies in which we operate, Vanguard has developed a set of investment principles over time that we think are important to long-term investment success. They include having clear and appropriate investment goals, developing a suitable asset allocation using broadly diversified funds, minimizing costs, and maintaining perspective and long-term discipline, as shown in **Figure 1**.

Figure 1: Vanguard asset allocation ETFs are built on Vanguard's investment principles



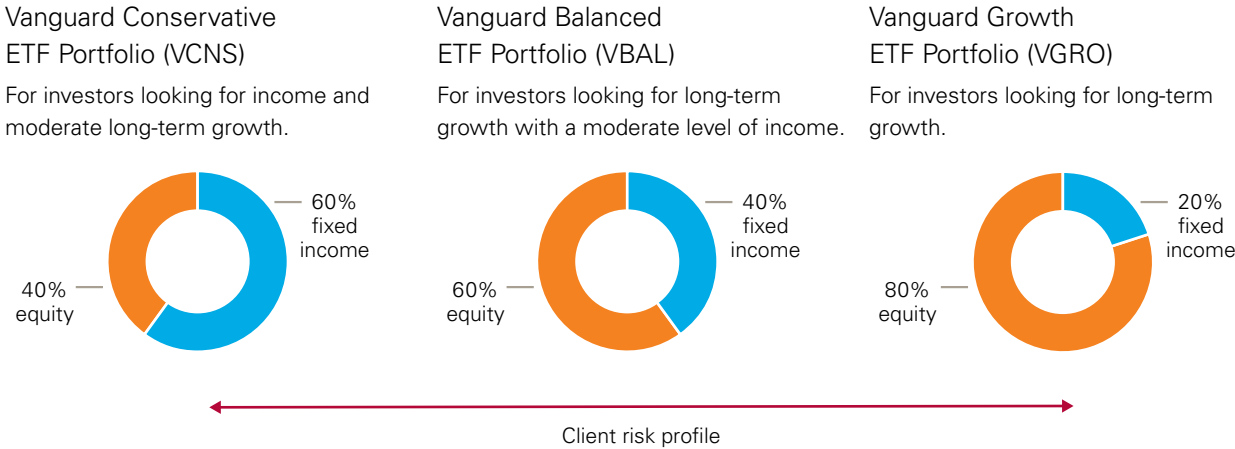
Source: Vanguard.

While these principles can be used by investors and advisors to construct portfolios on their own, Vanguard has been providing multi-asset portfolios that embed these principles in their construction through a single holding since our founding in 1975. Indeed, our oldest product in the United States, the Vanguard Wellington Fund, is a balanced portfolio (65% equity / 35% bond) that dates back to 1929. Vanguard’s suite of LifeStrategy Funds and Diversified Index ETFs in the U.S., U.K., and Australia employ similar investment methodologies to the asset allocation ETFs. In the following sections, we will explore the investment methodology and core research used in the construction of the asset allocation ETFs within the context of our investment principles.

Goals: Create clear, appropriate investment goals

A sound investment plan begins by outlining the investor’s goals as well as any relevant constraints, such as the investor’s time horizon and tolerance for risk. Ultimately, almost all investment goals can be translated into a required rate of return that the investor needs to meet their investment objective and a tolerance for risk they are willing to bear. As shown in **Figure 2**, the asset allocation ETFs take this into account by offering three asset allocations that allow investors to balance their preferences for long-term growth and risk in pursuit of their investment goals.

Figure 2: Three asset allocations to meet a range of investment goals



Source: Vanguard.

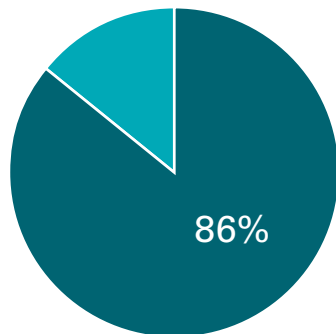
Asset allocation is a key driver of a portfolio’s risk and return

A portfolio’s asset allocation, defined as the mixture of broad equity and fixed income assets, tends to be a primary driver of its risk and return profile over time. For example, a seminal 1986 study by Brinson, Hood, and Beebower (henceforth, ‘BHB’), as well as Ibbotson and Kaplan (2000), found that a portfolio’s asset allocation is an important contributor to a portfolio’s return variability. These findings were confirmed by Vanguard’s own study of 303 Canadian balanced funds in 2016 that found 86% of a portfolio’s return variability can be explained by its policy portfolio, as shown in **Figure 3a**.

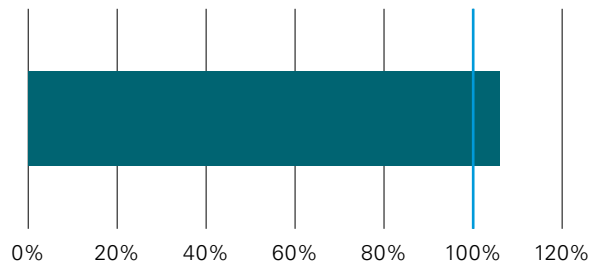
It is worth clarifying that this statistic is often misinterpreted. In some cases, it is suggested that the actual portfolio returns are explained (rather than their variability) or that asset allocation will only get you so far, and that stock selection and market timing are needed to add back the remainder. To clarify this misunderstanding, we can reframe the question in a way most investors interpret it: ‘What is the policy return as a percentage of the portfolio’s actual return?’ Using the same data (which assumes a modest implementation fee of 24bps), we could say that the policy return accounted for 106% of the actual portfolio’s total return on average, as shown in **Figure 3b**. In other words, the average Canadian balanced fund trailed its policy benchmark after their higher costs were taken into account, as we will discuss in more detail later.

Figure 3: Asset allocation tends to explain the risk and return profile of a portfolio

a. Median percentage of actual-return variation explained by policy return



b. Policy return as a percentage of the portfolio’s actual return



Notes: Data runs from January 1, 1990, through June 30, 2016. We calculated the adjusted R-squared represented by the percentage of actual-return variation explained by policy-return variation. Percentages shown represent the median observation from the distribution of percentage of return variation explained by asset allocation for balanced funds for 303 Canadian balanced funds. Calculations were based on monthly net returns, and policy allocations were derived from a fund’s actual performance compared with a benchmark using returns-based style analysis (as developed by William F. Sharpe) on a 36-month rolling basis. Funds were selected from Morningstar’s Multi-Sector Balanced category. Only funds with at least 48 months of return history were considered in the analysis. The policy portfolio was assumed to have an expense ratio of 2.0 bps per month (24 bps annually, or 0.24%). All returns are in Canadian dollars.

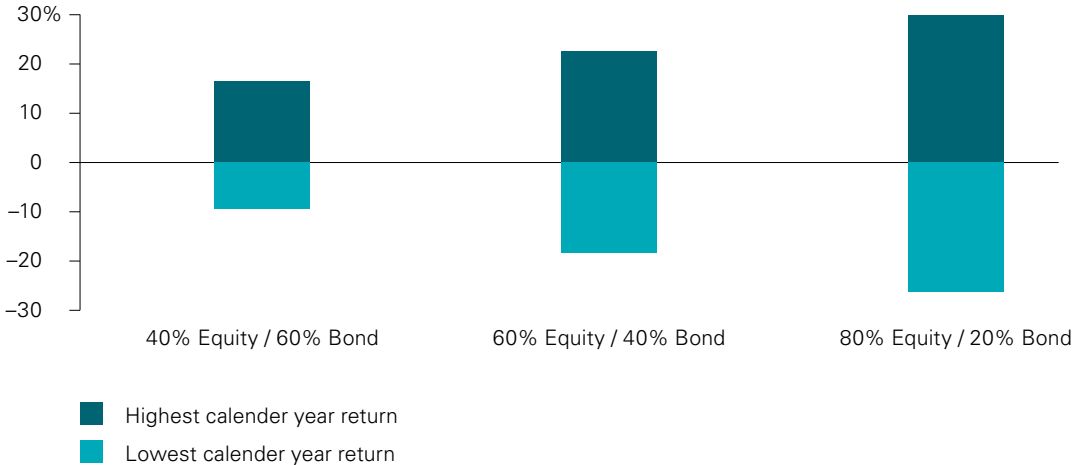
Sources: Vanguard calculations, using data from Morningstar, Inc.

Also relevant to this discussion is how a portfolio's return variability is only one measure of risk and there is a well-documented asymmetry in how investors experience gains relative to losses (Kahneman, 1979). In other words, how an investor would feel about losses incurred during a significant market event, such as the global financial crisis of 2008 – 2009, is often more important than how they view risk generally because it may evoke

a response that could alter their investment plan. In **Figure 4**, we examine the highest and lowest annual returns across the three asset allocations. It is clear that higher equity allocations have the potential for higher returns and also greater losses. Asset allocation is then a useful tool in helping control the range of returns (particularly negative returns) an investor could experience through time.

Figure 4: Asset allocations tend to define the spectrum of returns

Range of highest to lowest calendar year return for each asset allocation



Notes: Data cover the period August 1, 2000 to December 31, 2017. For each asset allocation, the target equity weights are 30% FTSE Canada All-Cap Index, 37.5% CRSP US Total Market, 25% FTSE Developed All-Cap ex NA Index, and 7.5% FTSE Emerging Markets All-Cap Index. The target bond weights are 58.7% Canadian Aggregate Bond Index, 18% US Aggregate Bond index (CAD-hedged), and 23.3% Global ex-US Aggregate Bond Index (CAD-hedged). All returns are in Canadian dollars.

Source: Vanguard, using data from Morningstar, Inc.

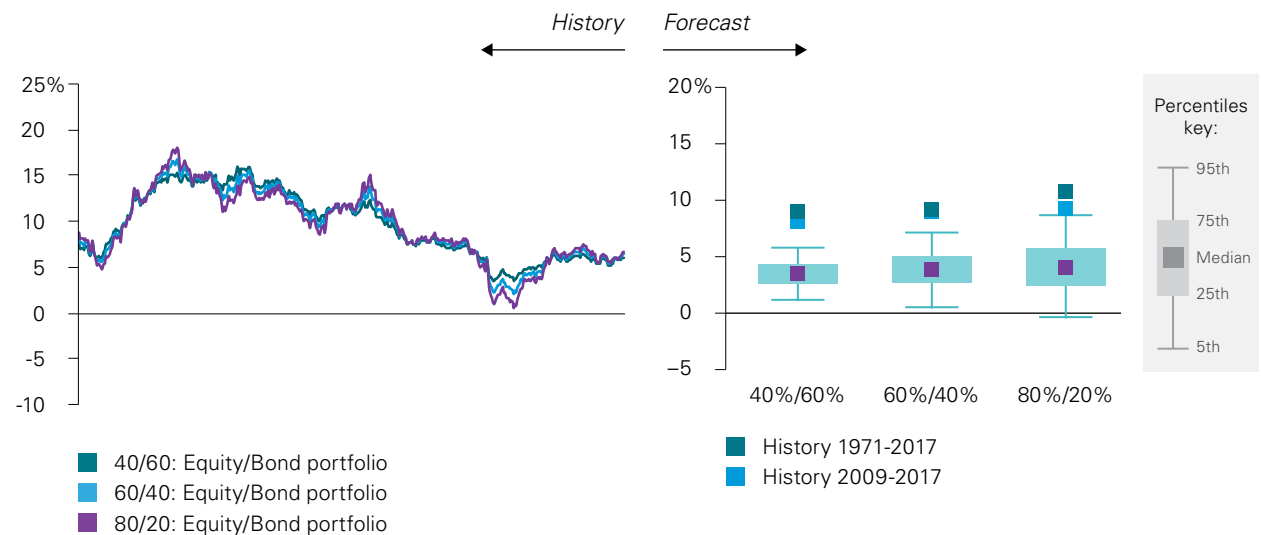
Asset allocation as a key driver of future return expectations

Asset allocation is also useful in gauging the range of returns portfolios are likely to experience going forward. As part of our annual Vanguard market and economic outlook (MEMO), we provide forward-looking nominal return distributions gross of fees for a range of asset allocations within the context of their historical experience, as shown in **Figure 5**. In today's

environment, with valuations elevated relative to history for both equities and fixed income, the distributions of forward-looking returns is shifted downward, indicating that returns are likely to be lower than their historical averages over the next decade. This can help investors by providing the probabilities of a specific asset allocation meeting their investment goals over their time horizon and highlights the need to keep implementation costs to a minimum to increase net returns.

Figure 5: A probabilistic return outlook can help investors assess the likelihood of meeting their goal

Ten year annualized nominal returns through time and probability distribution of future returns



Note: Data as of December 31, 2017. Forecast displays 5th/25th/75th/95th percentile ranges of 10,000 VCMM simulations for projected nominal returns for balanced portfolios. The equity portfolio is 30% Canadian equity and 70% global ex-Canada equity. The bond portfolio is 60% Canadian bonds and 40% global ex-Canada bonds (CAD-hedged). For details, see Vanguard economic and market outlook for 2018 (Davis, Aliaga-Diaz, Westaway, Wang, Patterson, and Ahluwalia 2017). All returns are in Canadian dollars.

Source: Vanguard.

Balance: Develop a suitable asset allocation using broadly diversified funds

Portfolio construction best practices dictate that investors diversify their portfolios among the global equity and fixed income markets. The asset allocation ETFs accomplish this through a limited number of market-cap weighted indexes, as shown in **Figure 6a**. This is a simple-to-understand, yet sophisticated approach to diversification because it provides a high level of exposure to around 94%¹ of public market securities (totalling more than 25,000 securities) that are re-valued every day based on current and expected events.

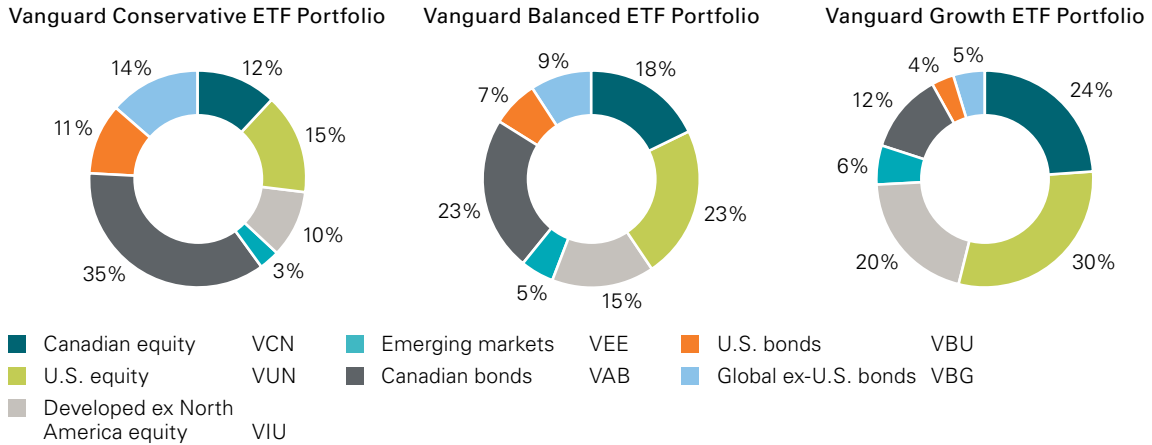
This means that the portfolio reflects the consensus estimate of each company's value at any given moment, and therefore the theoretically mean-variance-efficient portfolio of securities in each asset class. Canadian equities and fixed income are two exceptions to this methodology. For these securities, we apply a strategic overweight, commonly known as a home bias, which is discussed in more detail in **Text Box A**. The resulting equity portfolio is shown broken down by size, style, sector, country, and region in **Figure 6b** and fixed income portfolio by credit quality, sector and country, in **Figure 6c**.

¹ Global high yield bonds, local emerging market debt, convertible bonds, preferred shares and frontier markets represent around 6% of the global public markets and are not included.

Figure 6: A simple-to-understand, yet sophisticated approach to diversification

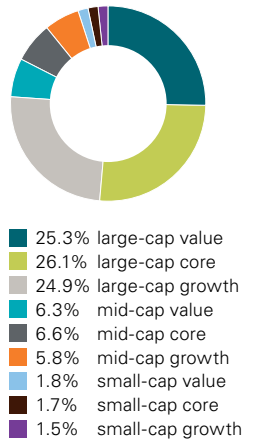
A limited number of indexes can provide broad diversification across and within asset classes

a. Target allocation to underlying ETFs

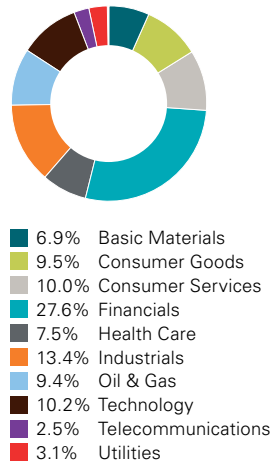


b. Equity exposure

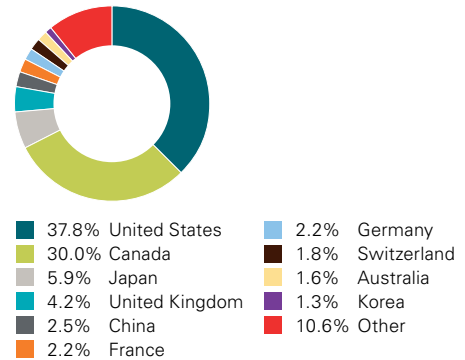
Size and style exposure



Sector exposure

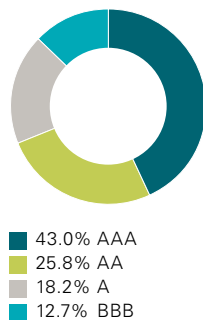


Country exposure

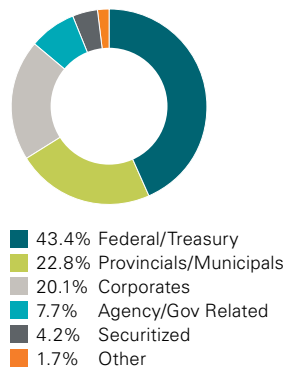


c. Fixed income exposure

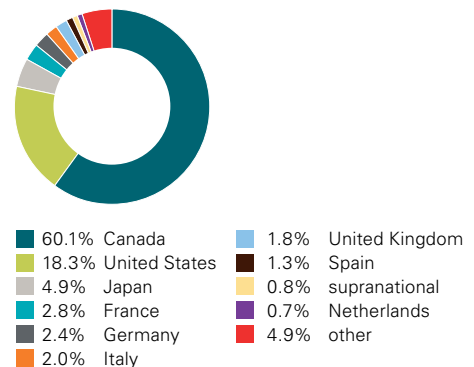
Credit quality



Sector exposure



Country exposure



Notes: Data as of January 31, 2018. Figures may not add up to 100% due to rounding.
Sources: Vanguard calculations, using data from FactSet, Barclays, and FTSE.

Diversification smooths the investor experience

Significant allocations to the broad equity and bond markets, rather than more concentrated investments in their sub-components, help smooth the investor experience by making the portfolio less vulnerable to the impact of significant performance swings in any particular asset class. In **Figure 7**, we illustrate this concept by showing the lack of persistence and high level of

dispersion from year to year for a number of sub-asset classes dating back to 2007. For example, emerging market equities were the top-performing asset class in 2007, 2009, and 2017, and the worst in 2008 and 2011. Similarly, Canadian government bonds were the best performer in 2008 and the worst performer in 2009. For comparison, we also display the more consistent (smoothed) performance of a broad market 60% equity / 40% fixed income portfolio.

Figure 7: Diversification smooths the investor experience through time

Asset class performance rank by calendar year

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
20.1	12.1	57.2	17.4	10.0	27.0	41.3	25.1	21.6	21.6	22.4
10.2	7.1	37.6	13.8	9.6	16.7	29.6	23.9	21.5	10.8	18.2
4.9	6.6	36.7	13.6	9.5	15.5	15.2	14.2	19.4	8.1	13.8
4.5	5.7	20.0	10.7	6.3	15.4	15.1	11.9	19.4	7.9	9.4
4.0	-9.8	15.0	9.3	5.2	15.3	13.1	11.3	14.9	6.8	8.6
1.3	-16.3	14.0	9.1	4.6	13.4	9.1	9.9	7.2	6.5	7.5
-1.4	-19.5	13.3	7.9	-0.7	9.4	3.4	9.0	3.7	6.1	3.0
-4.6	-21.2	7.4	7.0	-5.9	7.0	2.3	8.9	3.7	3.7	2.6
-10.5	-29.3	5.0	6.9	-10.1	6.5	0.6	8.6	3.7	1.4	2.4
-10.8	-34.3	3.6	6.1	-10.3	3.3	-1.6	7.6	1.6	1.0	1.1
-12.6	-36.1	1.0	5.0	-11.2	2.3	-2.3	3.5	-8.7	-0.3	0.1
-19.1	-42.8	-1.6	3.0	-18.0	-3.2	-3.5	-9.5	-9.6	-2.1	-5.0

- Balanced portfolio 60% equity / 40% fixed income
- Canadian investment-grade fixed income
- Global high yield fixed income
- Emerging markets fixed income
- Global fixed income (CAD-hedged)
- Commodities
- Canadian government fixed income
- Global real estate equities
- Developed markets ex-North America equities
- Emerging markets equities
- Canadian equities
- U.S. equities

Notes: This performance is hypothetical in nature and may not be representative of the actual performance of any portfolios that use ETFs that track indexes with shorter performance histories. The 60/40 portfolio consists of the following: 60% equities—16.4% FTSE Canada All Cap Index and 43.6% FTSE Global All Cap Index; 40% fixed income—23.5% Bloomberg Barclays Canadian Issues 300MM Index and 16.5% Bloomberg Barclays Global Aggregate Ex CAD Index (CAD-Hedged). Sub-asset-class returns are based on the following indexes: Canadian equities—FTSE Canada All Cap Index; U.S. equities—S&P 500 Index; developed markets ex-North America equities—FTSE Developed All Cap ex North America Index; emerging markets equities—FTSE Emerging Markets All Cap China A Inclusion Index; global real estate equities—FTSE EPRA NAREIT Global Index; commodities—Bloomberg Commodity Index; Canadian investment-grade fixed income—Bloomberg Barclays Canadian Issues 300MM Index; Canadian government fixed income—Bloomberg Barclays Global Canada Index; global fixed income—Bloomberg Barclays Global Aggregate Bond Index (CAD-Hedged); emerging markets fixed income—Bloomberg Barclays Emerging Markets Aggregate Bond Index; and global high-yield fixed income—ICE BofAML Global High Yield Index. All returns are in Canadian dollars.

Sources: Vanguard calculations using data from Bloomberg, Bloomberg Barclays, FTSE and ICE BofAML.

Additional advantages of using broad market index funds

Implementing an asset allocation through a limited number of broad-market index funds can also provide consistent asset class exposure through time. In other words, although asset values will be re-weighted by market participants in real time, those changes tend to be relatively small from one period to the next, making

the aggregate exposures to securities, styles, sectors, credit qualities, counties and regions relatively stable. Low portfolio turnover, as a proxy for trading costs, also helps result in low portfolio implementation costs that are associated with higher net returns (Rowley, 2017). Lower turnover can also help reduce the tax drag from realized capital gains (Rich et al, 2015).

Text Box A: Home bias – Balancing theory and implementation

Financial theory suggests that investors construct their asset class exposure in line with market capitalization weights. After all, market capitalizations reflect the consensus estimate of each company's value at any given moment. Therefore, the methodology for the asset allocation ETFs is to weight assets according to their asset weights within all asset classes with the exception of Canadian equities and bonds. Indeed, you may have noticed from **Figure 6** that we designed the asset allocation ETFs with overweights to Canadian securities. These overweights, known as a home bias, are a common practice in portfolio construction among individuals, institutions, and asset managers. While there are many theories as to what drives home bias, most relevant is that these decisions are often conscious and intentional choices made on the part of investors.

When it comes to sizing an appropriate home bias, we take into consideration factors such as investors' home-country preferences, the potential for return variation and volatility reduction from adding more global securities, the degree of market concentration, relative implementation costs (including taxes and liquidity), the impact of currency (to be covered later) and regulatory constraints (Scott, 2017). When weighing these factors collectively, we believe a home bias of 30% for equities and 60% for fixed income represents a reasonable trade-off between the benefits of adding more global equities while still maintaining a meaningful allocation to Canadian securities. As time goes on, the evolution of investor preferences for global diversification and a trend of declining implementation costs may warrant a lower home bias.

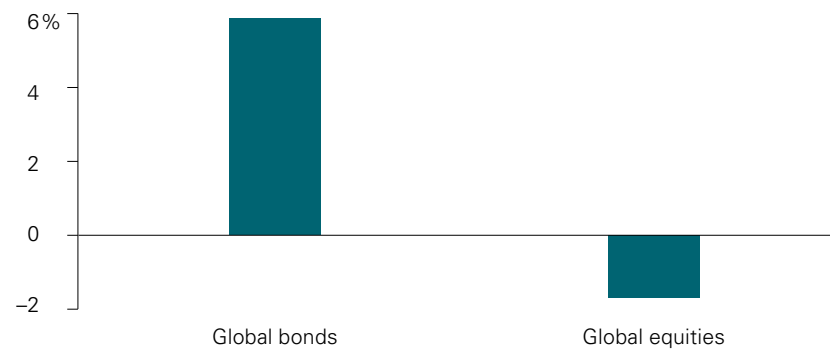
Methodology around currency exposure

Our methodology for managing currency exposure is to use hedged global fixed income and leave the currency of global equities unhedged. This decision is based on the fact that currency has a long-run expected return of approximately zero, and because it impacts the volatility of the two asset classes in different ways (as shown in **Figure 8**). Because currency is much more volatile than fixed income, it tends to significantly increase the volatility of a global bond portfolio. On the other hand,

the volatilities of currency and global equities are more comparable. As a result, the impact to volatility becomes a function of the correlation between the two asset classes. For Canadian investors, exposure to a basket of global currencies can help diversify and lower the volatility of global equities due to its typically negative correlation. Interestingly, relative to other developed markets, Canada has realized the most consistent volatility reduction when leaving global equities unhedged (Labarge et al, 2014).

Figure 8: Currency tends to impact volatility in different ways by asset class

Volatility impact from currency exposure translated into Canadian dollars



Notes: Data are from February 1, 1999, to December 31, 2017. Global equities are represented by the MSCI ACWI Index and global bonds are represented by the Bloomberg Barclays Global Aggregate Index. Volatility percentages reflect Canadian currency.

Source: Vanguard calculations, using data from Macrobond.

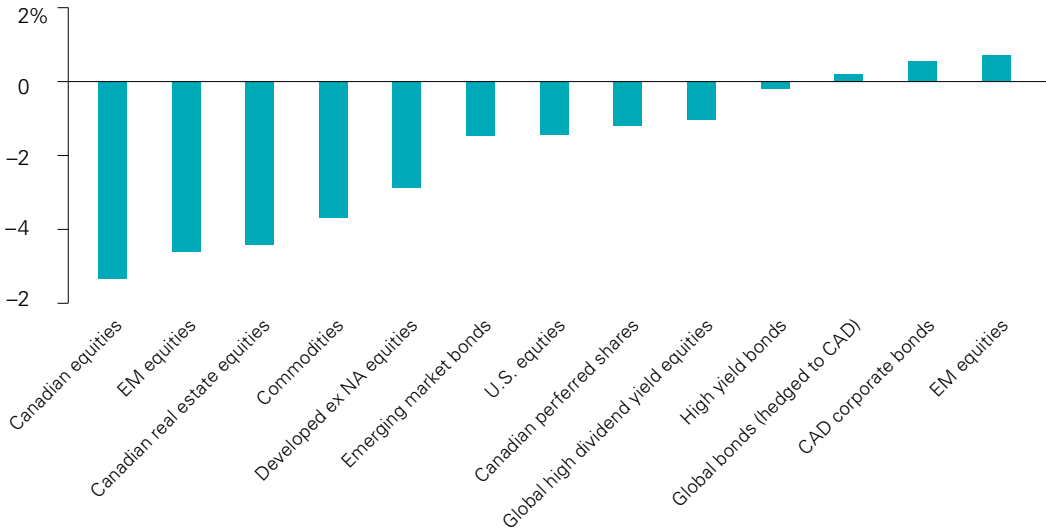
We also apply a portfolio context to the currency-hedging decision considering that we maintain a Canadian equity home bias and that the portfolios are multi-asset and encompass significant allocations to Canadian dollar and hedged global fixed income (Roberts, 2018). For example, the total amount of foreign currency exposure for the growth, balanced and conservative portfolios would be around 56%, 42% and 28%, respectively. Considering that the more equity-heavy portfolios with greater currency exposure should be used by higher-risk-tolerant investors with longer time horizons, the amount of currency exposure in each portfolio also aligns well with investors who can tolerate its shorter-term volatility.

The role of fixed income. If not high-quality bonds, then what?

The secular decline in bond yields we have experienced has resulted in returns from the global bond markets that rival those of the global equity markets. For example, over the past 30 years, Canadian equities and bonds delivered total returns of 8.7% and 7.2%, respectively.² In today’s environment, low bond yields and the potential for rising interest rates indicate that fixed income returns are likely to be muted over the next decade, with risks elevated relative to history.

Figure 9: The role of fixed income. If not high-quality bonds, then what?

Performance of various asset classes during the worst decile periods for Canadian equities



Notes: Data runs from January 1, 2003, to December 31, 2017. Canadian equities are represented by the TSX Composite Index; emerging market equities are represented by the MSCI Emerging Market Index; Canadian real estate are represented by the TSX Real Estate Index; commodities are represented by the Goldman Sachs Commodities Index; Developed ex-North America equities are represented by the MSCI EAFE Index; U.S. equities are represented by the S&P 500 Index; Canadian preferred shares are represented by the TSX Preferred Index; global high-dividend yield equities are represented by the MSCI World High Dividend Yield Index; high-yield bonds are represented by the BOAML Canadian Issuers High Yield Index; global bonds are represented by the Bloomberg Barclays Global Aggregate Index (CAD-hedged); Canadian corporate bonds are represented by the Bloomberg Barclays Canadian Corporate Index; CAD treasury bonds are represented by the Bloomberg Barclays Canadian Treasury Index. All returns are in Canadian dollars.

Source: Vanguard calculations based on data from Macrobond and Morningstar, Inc.

² Canadian equities are represented by the MSCI Canada Index. Canadian bonds are represented by the Canadian component of the Citigroup World Government Bond Index from 1985 through 2001 and the Bloomberg Barclays Canadian Issues 300MM Index thereafter. Data runs from January 1, 1988, to December 31, 2017. Returns are in Canadian dollars.

Even in their worst periods, however, bonds remain a more defensive investment than equities. While a bear market will rarely cause a decline of 10% in bonds, equity markets can decline by 50% or more. And those latter periods are when the portfolio ballast provided by bonds is needed most. We illustrate this in **Figure 9** by examining periods of market stress defined as the worst decile of monthly Canadian equity market returns. All other asset categories commonly cited as ‘bond substitutes,’ (such as real estate and dividend paying equities, commodities, preferred shares, and high yield and emerging market bonds) suffered losses. On the other hand, high-quality investment grade fixed income, including hedged global, corporate and government bonds, provided positive counter balancing and the greatest diversification.

Traditional diversification has been very competitive

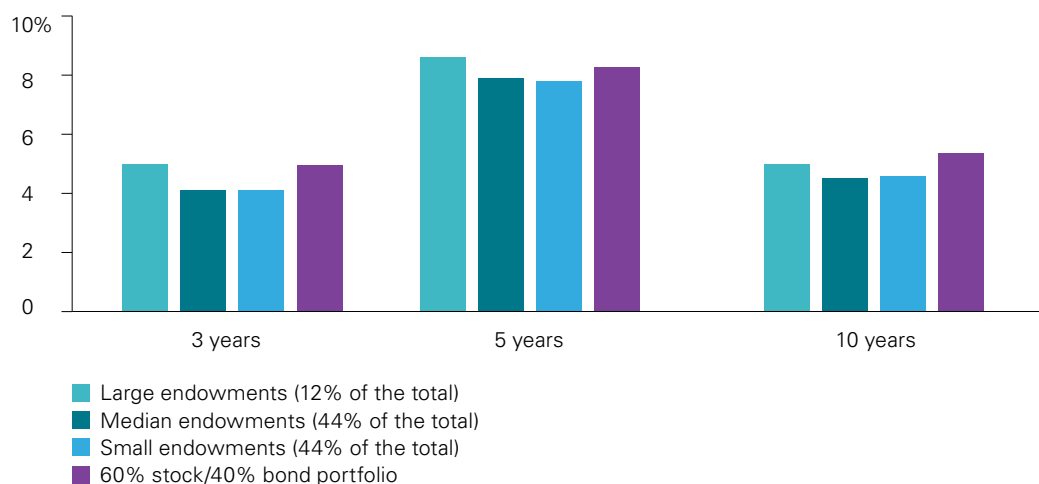
The final point on balance worth discussing is just how competitive traditional diversification has been relative to more ‘sophisticated’ approaches. Indeed, the ‘endowment model,’ as implemented by large organizations such as Harvard and Yale University, has

demonstrated notable long-term returns using alternative investments, leaving many investors eager to achieve similar success. However, the large-endowment category represents only a small portion of all endowments and even they have struggled in recent periods. The remaining 88% of endowments, with average assets of less than \$1 billion (USD), have performed more modestly relative to traditionally diversified portfolios.

To illustrate this point, in **Figure 10**, we compare the results from the NACUBO-Commonfund Study of Endowments over the past three, five and ten years to a 60% equity / 40% fixed income model portfolio (implemented at a modest 24 bps fee).³ It is noteworthy that the traditionally diversified portfolio outperformed all endowment categories over most of these periods, only trailing the largest endowments over the past three-year and five-year periods by a small amount. While it is still true that these large endowments have outperformed a traditionally diversified portfolio over the past 20 and 30 years given their distinct advantages, the majority of investors would have been better off had they simply invested in transparent, diversified, public market investments.

Figure 10: Traditional diversification has been very competitive relative to the ‘endowment model’

Annualized nominal returns from the NACUBO-Commonfund study on the performance of endowment portfolios



Notes: Data as of June 30 for each year through 2017. 60% equity / 40% bond portfolio: Domestic equity (42%) is Dow Jones Wilshire 5000 Index through April 22, 2005, and MSCI US Broad Market Index thereafter. Non-U.S. equity (18%) is MSCI All Country World Index ex US. Bonds (40%) are Barclays U.S. Aggregate Bond Index. The traditional 60/40 portfolio assumes a 24bps implementation fee. All returns are in US dollars.

Sources: Vanguard calculations, using data from NACUBO-Commonfund Study of Endowments.

Cost: Minimize cost

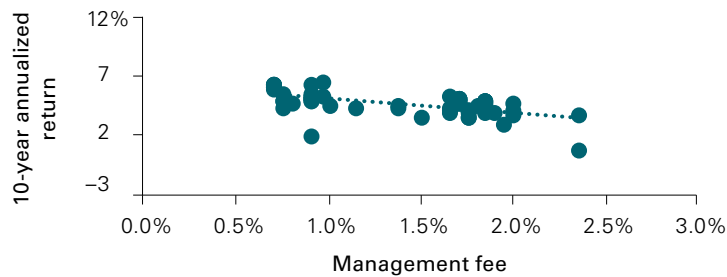
When it comes to investing, there is no reason to assume that you get more if you pay more. Instead, every dollar paid is simply a dollar that comes out of the net return. In **Figure 11**, we test this assertion and display the net returns for all of the global balanced funds with ten years of return data available for sale in Canada.

The net returns, once costs are taken into account, are markedly lower across the board. And, there is a strong relationship between the management fee of each portfolio and its corresponding net return. The implications are clear: By investing in portfolios with low management fees, investors increase their likelihood of earning higher net returns.

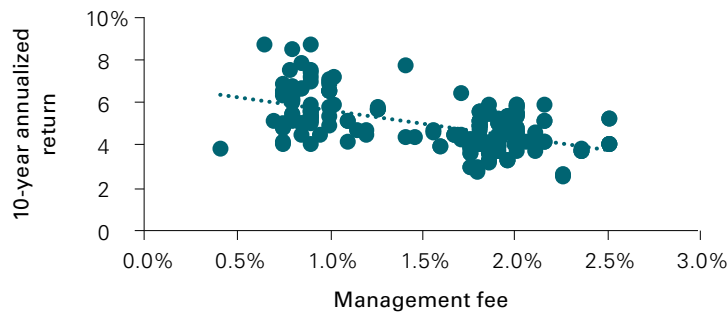
Figure 11: Costs detract from returns dollar-for-dollar, making them a key performance driver

Annualized 10-year net returns for global balanced funds relative to their management fee

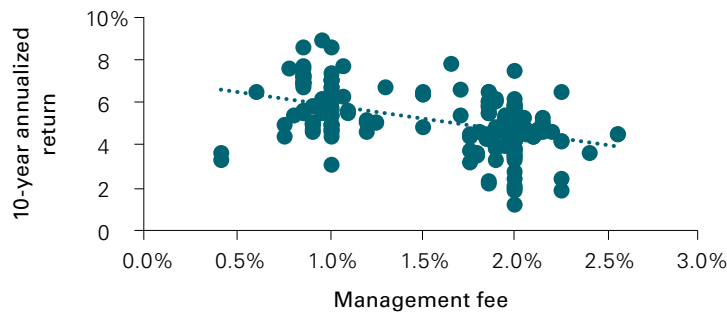
Global Fixed Income Balanced



Global Neutral Balanced



Global Equity Balanced



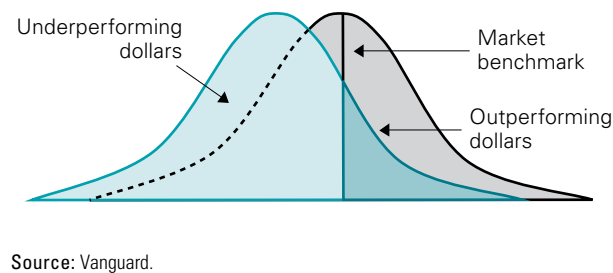
● Net return

Notes: Data cover the period January 1, 2008, to December 31, 2017. All returns are in Canadian dollars.
Sources: Vanguard calculations, using data from Morningstar, Inc.

The zero-sum game of investing, illustrated in **Figure 12**, is another reason costs are so important. In any market, the average return for all investors before costs is, by definition, equal to the market return. Once various costs are accounted for, however, the distribution of returns realized by investors moves to the left, because their aggregate return is now less than the market's. The actual return for all investors combined is thus the market return reduced by all costs incurred. The implication of this is that, after costs, only a minority of investors are able to outperform the markets (occupying the darker blue area).

To examine the empirical truth, we analyzed the percentage of active global balanced funds available for sale in Canada that would have underperformed the back-tested results for the asset allocation ETFs in their respective Morningstar categories over the past ten years. Since each of the seven building block indexes used employs a market-cap-weighted methodology, they will earn the target market's rate of return before costs.

Figure 12: The zero-sum game: Distribution of investors's returns before and after cost

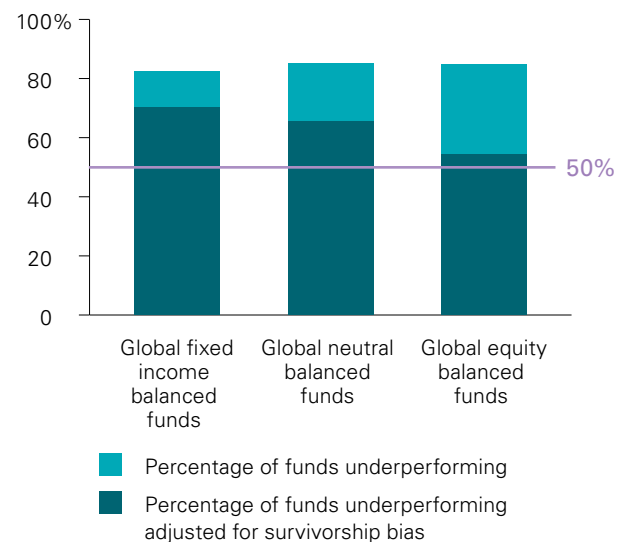


To create a fair comparison, we then deducted 24 basis points (the 22 basis-point management fee plus an additional 2 basis points to account for other operational or implementation costs) from the gross index returns to create a hypothetical back-tested return stream.

The performance results, which are displayed in **Figure 13**, are striking. In each category, the majority of active global balanced funds trailed the respective Vanguard portfolio, and that number was even higher when accounting for funds that were either closed or liquidated over the period. Although skilled managers exist and can provide the opportunity for outperformance, the track record of active management relative to low cost and diversified indexes has been underwhelming, primarily due to the higher costs that come along with the research and implementation while trying to outperform the market (including commissions, management fees, bid-ask spreads, administrative costs and market impact).

Figure 13: Costs create a significant headwind to outperformance

Percentage of global balanced funds outperformed by the Vanguard asset allocation ETFs' backtest



Notes: Data cover the period January 1, 2008, to December 31, 2017. The Vanguard portfolios assume a 24bps implementation fee. All returns are in Canadian dollars.

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

Discipline: Maintain perspective and long-term discipline

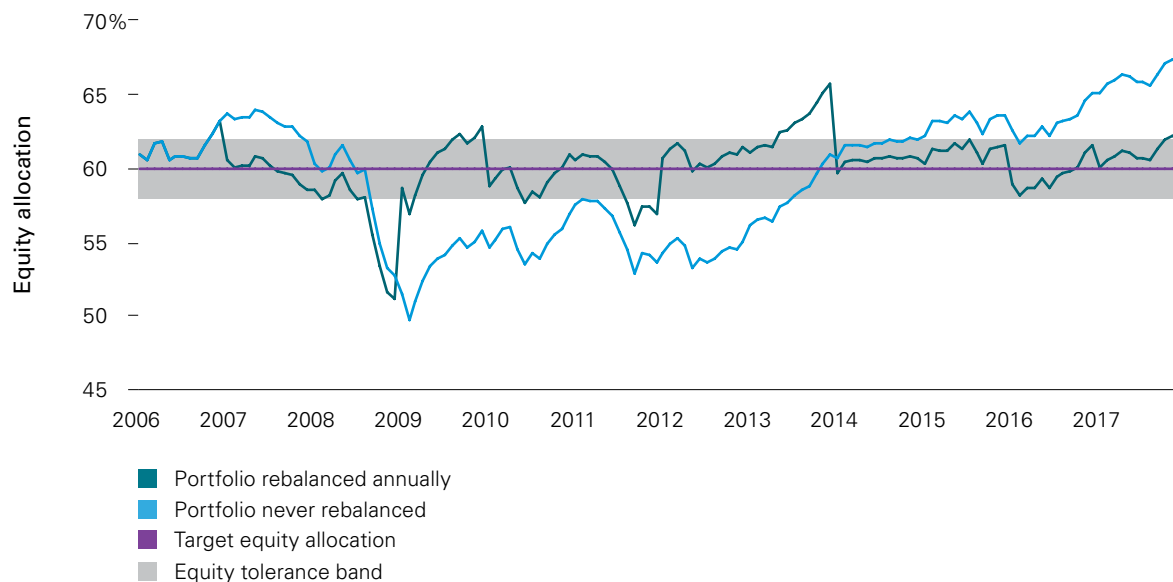
Investing can provoke strong emotions. In the face of market turmoil, some investors may find themselves making impulsive decisions or, conversely, becoming paralyzed, unable to rebalance their portfolios. The asset allocation ETFs can help investors and advisors by providing embedded discipline through their automatic rebalancing, thus alleviating many of the operational complexities and administrative burdens that come along with executing an asset allocation program. Single-ticket portfolios can also help remove the 'temptation to tinker' with the underlying investments over time and make ill-timed changes to the asset allocation.

The importance of rebalancing

We have previously discussed that the asset allocation decision is a powerful tool in explaining both the risk and return profile of a portfolio. However, that power is eroded over time, as the portfolio drifts from its target asset mix in different market environments. Therefore, rebalancing is necessary to bring portfolios back into line with the allocation designed for the investor's specific goal. **Figure 14** shows how an investor's equity allocation can grow or shrink unintentionally when a portfolio is left to drift. For example, during the global financial crisis of 2008-2009, a portfolio that began with a target equity allocation of 60% fell to only 50% and remained underweight until 2014. Similarly, the portfolio had well over 65% invested in equities by the end of 2017 following the subsequent bull market.

Figure 14: Consistent rebalancing maintains a portfolio's risk profile and eliminates drift

Changes in equity exposure relative to target for a rebalanced and 'drifting portfolio'



Notes: Data cover the period January 1, 2006, to December 31, 2017. The initial equity allocations for both portfolios were 30% FTSE Canada All-Cap Index, 37.5% CRSP US Total Market, 25% FTSE Developed All-Cap ex NA Index and 7.5% FTSE Emerging Markets All-Cap Index. The initial bond allocations for both portfolios were 58.7% Canadian Aggregate Bond Index, 18% US Aggregate Bond Index (CAD-hedged) and 23.3% Global ex-US Aggregate Bond Index (CAD-hedged). The rebalanced portfolio is returned to the initial allocations at the end of each June and December of each year. All returns are in Canadian dollars.

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

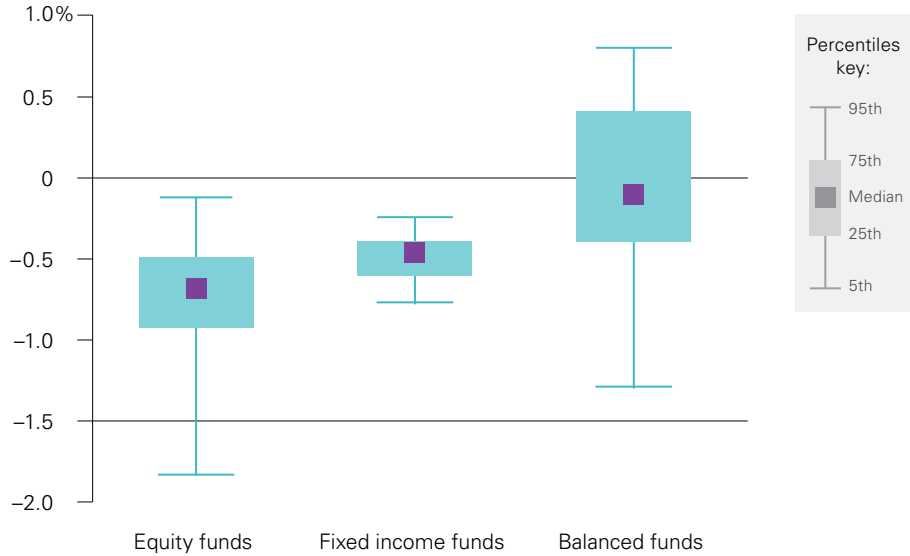
For investors managing their own portfolios, semi-annual or annual rebalancing if the equity allocation has deviated more than 5% from its target is often enough to strike a balance between the benefits of keeping a portfolio in line with its policy allocation and the transaction and monitoring costs of more frequent rebalancing (Jaconetti et al, 2010). However, the asset allocation ETFs can use daily cash flows to keep their holdings close to target. In the case of a big market movement that can cause the portfolios to deviate from their stated targets, we apply a 2% tolerance band. The result is an asset allocation that closely tracks the policy portfolio while keeping transaction costs low and also alleviating many of the operational complexities and administrative burdens of executing an asset allocation program, freeing up valuable time that can be spent elsewhere.

Managing the ‘behavioural gap’

Another critical factor related to discipline is minimizing the behavioural gap that can arise between the performance of an investment and the assets invested in the same strategy. **Figure 15** displays the distribution of ten-year investor returns versus fund returns and shows how investors generally trail the portfolios they are invested in as a result of the timing of their cash flows (Schlanger et al, 2018). There is also typically a relationship between how volatile an investment category is and how much investors tend to trail the portfolio returns. On the other hand, balanced investments that diversify across asset classes have realized less return drag. The implication is that multi-asset portfolios can help minimize the behavioural gap by removing the ‘temptation to tinker’ with the underlying investments, which can ultimately lead to higher net returns for investors.

Figure 15: Single ticket portfolios can help minimize the behavioural gap through time

Distribution of 10-year U.S. investors’ returns relative to their funds’ returns



Notes: We use U.S. data for this figure because of a more robust data sample to perform the analysis. For more information on Canadian investor vs. fund returns, please see (Schlanger et al, 2018). All returns are in U.S. dollars.

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

Conclusion

Vanguard asset allocation ETFs can be used by investors saving for a broad range of goals or for the drawdown phase of retirement when combined with a systematic withdrawal and spending strategy.

They are simple to understand, yet provide investors with a sophisticated approach to portfolio construction built on our investment principles (goals, balance, costs and discipline) and our core research on strategic asset allocation, global diversification and passive implementation.

These single-ticket ETFs also provide embedded discipline and can help with the operational complexity of executing an asset allocation strategy, freeing up time that can be allocated elsewhere.

Combining quantitative data and our practical experience working with investors around the globe, the asset allocation ETFs are designed to offer a broadly diversified, professionally managed portfolio within a low-cost ETF structure.

References

- Donaldson, Scott J., Maria Bruno, David J. Walker, Todd Schlanger, Francis M. Kinniry Jr., 2013. *Vanguard's framework for constructing diversified portfolios*. Valley Forge, Pa: The Vanguard Group.
- Donaldson, Scott J., David J. Walker, Kimberly Stockton; James Balsamo; and Yan Zilbering, 2017. *Vanguard's framework for constructing globally diversified portfolios*. Valley Forge, Pa: The Vanguard Group.
- Kahneman, Daniel, and Amos Tversky. *Prospect Theory: An analysis of decision under risk*. *Econometrica*, 47(2), pp. 263-291, March 1979.
- Jaconetti, Colleen M., Francis M. Kinniry, and Yan Zilbering, 2010. *Best practices for portfolio rebalancing*. Valley Forge, Pa: The Vanguard Group.
- Jaconetti, Colleen M., Michael A. DiJoseph, Zoe B. Odenwalder; and Francis M. Kinniry Jr, 2016. *From assets to income: A goals-based approach to retirement spending*. Valley Forge, Pa: The Vanguard Group
- Labarge, Karin P, Charles Thomas, Frank Polanco, and Todd Schlanger, 2014. *To hedge or not to hedge? Evaluating currency exposure in global equity portfolios*. Valley Forge, Pa: The Vanguard Group.
- Rich, Ryan, Colleen M. Jaconetti, Francis M. Kinniry, Donald G. Bennyhoff, and Yan Zilbering, 2015. *Putting a value on your value: Quantifying Vanguard Advisor's Alpha in Canada*. Valley Forge, Pa: The Vanguard Group.
- Roberts, Daren R., Paul m. Bosse, Scott J. Donaldson, and Mathew Tufano, 2018. *The portfolio currency-hedging decision, by objective and block by block*. Valley Forge, Pa: The Vanguard Group.
- Rowley, James J., Garrett L. Harbron, Matthew C. Tufano, 2017. *In pursuit of alpha: Evaluating active and passive strategies*. Valley Forge, Pa: The Vanguard Group.
- Scott, Brian J., James Balsamo, Kelly N. Mcshane, and Christos Tasopoulos, 2017. *The global case for strategic asset allocation and an examination of home bias*. Valley Forge, Pa: The Vanguard Group.
- Schlanger, Todd, Colleen M. Jaconetti, Francis M. Kinniry, Donald Bennyhoff, and Yan Zilbering, 2018. *Putting a value on your value: Quantifying Vanguard Advisor's Alpha in Canada*. Valley Forge, Pa: The Vanguard Group.
- Vanguard's Principles for Investing Success, 2014*. Valley Forge, Pa: The Vanguard Group.
- Wallick, Daniel W., Brian Wimmer, and Todd Schlanger, 2012. *Assessing endowment performance: The enduring role of low-cost investing*. Valley Forge, Pa: The Vanguard Group.
- Wallick, Daniel W., Brian Wimmer, James J. Balsamo, 2014. *Assessing endowment performance: The enduring role of low-cost investing*. Valley Forge, Pa: The Vanguard Group
- Westaway, Peter, and John Velis, 2014. *Vanguard's approach to target-allocation funds in the UK*. Vanguard Asset Management.

THIS PAGE INTENTIONALLY LEFT BLANK

Connect with Vanguard® > vanguardcanada.ca

WE'RE IN IT TOGETHER

Investment objectives, risks, charges, expenses and other important information about a fund are in the prospectus; read and consider it carefully before investing.

BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. BARCLAYS® is a trademark and service mark of Barclays Bank Plc, used under license. Bloomberg Finance L.P. and its affiliates, including Bloomberg Index Services Limited ("BISL") (collectively, "Bloomberg"), or Bloomberg's licensors own all proprietary rights in the Bloomberg Barclays Indices. The products are not sponsored, endorsed, issued, sold or promoted by "Bloomberg or Barclays". Bloomberg and Barclays make no representation or warranty, express or implied, to the owners or purchasers of the products or any member of the public regarding the advisability of investing in securities generally or in the products particularly or the ability of the Bloomberg Barclays Indices to track general bond market performance. Neither Bloomberg nor Barclays has passed on the legality or suitability of the products with respect to any person or entity. Bloomberg's only relationship to Vanguard and the products are the licensing of the Bloomberg Barclays Indices which are determined, composed and calculated by BISL without regard to Vanguard or the Vanguard Funds and ETFs or any owners or purchasers of the products. Bloomberg has no obligation to take the needs of the products or the owners of the products into consideration in determining, composing or calculating the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays is responsible for and has not participated in the determination of the timing of, prices at, or quantities of the products to be issued. Neither Bloomberg nor Barclays has any obligation or liability in connection with the administration, marketing or trading of the products.

The S&P 500 Index is a product of S&P Dow Jones Indices LLC ("SPDJ"), and has been licensed for use by The Vanguard Group, Inc. (Vanguard). Standard & Poor's®, S&P® and S&P 500® are registered trademarks of Standard & Poor's Financial Services LLC ("S&P"); Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC ("Dow Jones"); and these trademarks have been licensed for use by SPDJ and sublicensed for certain purposes by Vanguard. Vanguard ETFs are not sponsored, endorsed, sold or promoted by SPDJ, Dow Jones, S&P, their respective affiliates, and none of such parties make any representation regarding the advisability of investing in such product(s) nor do they have any liability for any errors, omissions, or interruptions of the S&P 500 Index.

London Stock Exchange Group companies include FTSE International Limited ("FTSE"), Frank Russell Company ("Russell"), MTS Next Limited ("MTS"), and FTSE TMX Global Debt Capital Markets Inc. ("FTSE TMX"). All rights reserved. "FTSE®", "Russell®", "MTS®", "FTSE TMX®" and "FTSE Russell" and other service marks and trademarks related to the FTSE or Russell indexes are trademarks of the London Stock Exchange Group companies and are used by FTSE, MTS, FTSE TMX and Russell under licence. All information is provided for information purposes only. No responsibility or liability can be accepted by the London Stock Exchange Group companies nor its licensors for any errors or for any loss from use of this publication. Neither the London Stock Exchange Group companies nor any of its licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the results to be obtained from the use of the FTSE Indexes or the fitness or suitability of the Indexes for any particular purpose to which they might be put.

CFA® is a registered trademark owned by CFA Institute.



© 2018 Vanguard Investments Canada Inc.
All rights reserved.

INAFQ_CA 082018