



Vanguard®

Global equities: Balancing home bias and diversification – A Canadian investor's perspective

Vanguard research

July 2014

David C. Pakula, David J. Walker, CFA, David T. Kwon, CFA, Paul M. Bosse, CFA, Vytautas Maciulis, Christopher B. Philips, CFA

- Equities outside Canada, including those of developed and emerging markets, account for 96% of the global market capitalization, representing the majority of the world's equities.
- However, according to the most recent survey from the International Monetary Fund, Canadian investors only allocate about 40% of their total equity investments outside Canada.¹
- This paper evaluates the short- and long-term impacts of global diversification and finds that Canadian investors should consider increasing their allocation to international equities.

¹ See Philips et. al (2012) for a discussion of home bias. Home bias data has been updated since the paper's original publication using the most recent data from the IMF Coordinated Portfolio Investment Survey.

Characteristics of the Canadian equity market

For many investors, foreign securities play an important diversification role—reducing portfolio risk over time. A key question posed by many investors, however, is “how much should I allocate?” Financial theory suggests that investors should construct their asset class exposure in line with global-market capitalizations, meaning that a forward-looking efficient portfolio, which we will discuss later, would only have 3.6% of the equities allocated to Canadian stocks since Canadian equities accounted for 3.6% of the global equity market as of February 28, 2014 (see **Figure 1**). However, according to the most recent survey from the International Monetary Fund (IMF), Canadian investors allocated approximately 59% of their total equity allocation to Canadian equities—a 16.4x overweight. So despite economic theory and the recognized benefits of diversifying a portfolio globally, home bias has been exceptionally strong among Canadian nationals.

There are many theories as to what drives home bias. Indeed, home bias is a recognized global phenomenon, preventing domestic investors from being fully diversified across global markets. In addition, this bias is often conscious and intentional, with investors actively overweighting domestic holdings at the expense of foreign securities.

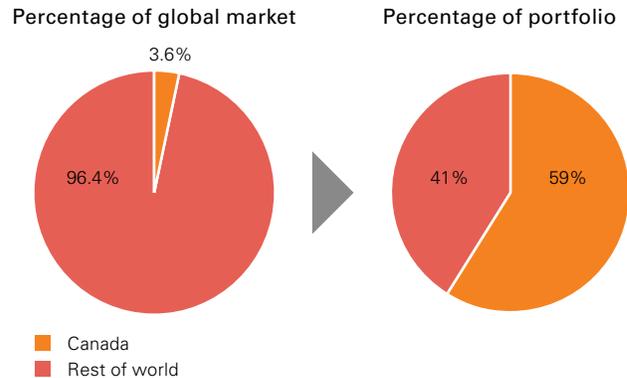
Prior Vanguard research (Philips, 2012) found that expectations regarding future return differentials, a preference for the familiar, corporate governance standards, the need to hedge domestic liabilities (if applicable), perceived global exposure through multinationals and currency risk can cause investors to overweight domestic securities. That said, maintaining a significant home bias gives rise to some clear implications.

Implications of home bias

Security concentration

Figure 2 displays the top 10 holdings in the Canadian and global equity markets. Canada is significantly more concentrated than the global equity market. The top 10

Figure 1: Canadian equity is a relatively small part of the global equity market



Sources: International Monetary Fund’s Coordinated Portfolio Investment Survey (2012) and FactSet. Market cap data as of February 28, 2014; holdings data as of December 31, 2012.

Notes: The IMF’s Coordinated Portfolio Investment Survey was used in conjunction with market-cap information to determine domestic and foreign investment. The investment holdings data for Canada can be categorized as either “foreign investment by domestic investors” or “domestic investment by domestic investors.” The sum of these equals “total investment by domestic investors.” The percentage allocated to domestic securities divides “domestic allocation by domestic investors” by the “total investment by domestic investors.”

holdings in Canada make up nearly 36% of the index. In contrast, the top 10 securities account for just 1.2% of the global market. This comparison can also be extended to individual organizations, such as Royal Bank of Canada, with an overweight of almost 31x (6.1%/0.20%) relative to its weight in the global market. These figures represent sector concentration now, but this has not always been the case. Interestingly, Nortel, at its peak, accounted for roughly 33% of Toronto Stock Exchange. Holding a sizable overweight to Canadian equities implies a significant bet on Canada to perform better than the global market. However, this also means that an investor solely invested in Canadian equities is considerably more exposed to the idiosyncratic risks of these organizations than a more globally diversified investor.

Figure 2: The Canadian equity market is concentrated relative to the global equity market

A: Top 10 holdings in Canadian equity market

Holdings	Market value (CAD bn)	Market weight	Global weight
Royal Bank of Canada	104	6.1%	0.20%
Toronto-Dominion Bank	92	5.4%	0.18%
Bank of Nova Scotia	77	4.5%	0.15%
Suncor Energy Inc.	54	3.2%	0.10%
Valeant Pharmaceuticals International, Inc.	53	3.1%	0.10%
Canadian National Railway Company	52	3.1%	0.10%
Bank of Montreal	47	2.8%	0.09%
Canadian Natural Resources Limited	44	2.6%	0.08%
Imperial Oil Limited	42	2.5%	0.08%
Enbridge Inc.	39	2.3%	0.07%

B: Top 10 holdings in global equity market

Holdings	Market value (CAD bn)	Market weight
Apple Inc.	520	0.99%
Exxon Mobil Corporation	462	0.88%
Google Inc. Class A	452	0.86%
Microsoft Corporation	352	0.67%
Berkshire Hathaway Inc. Class B	316	0.60%
Roche Holding Ltd Genusssch.	290	0.55%
Johnson & Johnson	288	0.55%
General Electric Company	284	0.54%
Royal Dutch Shell Plc Class B	275	0.52%
Wells Fargo & Company	270	0.52%

Notes: Market values translated to the Canadian dollar. Canadian equities represented by MSCI Canada Index; Global equities represented by MSCI All Country World Index. Data through February 28, 2014.

Sources: Vanguard calculations, using data from FactSet.

Sector concentration

When we examine security concentrations, portfolios focused on Canadian equities are likely to be concentrated in a few sectors or industries. **Figure 3** displays the weight of 10 equity sectors relative to their weight in the global market. The Canadian equity market is notably overweight in the energy and financials sectors with a more modest overweight in materials. As a by-product, information technology, health care, consumer discretionary and consumer staples are all underweight relative to the global market.

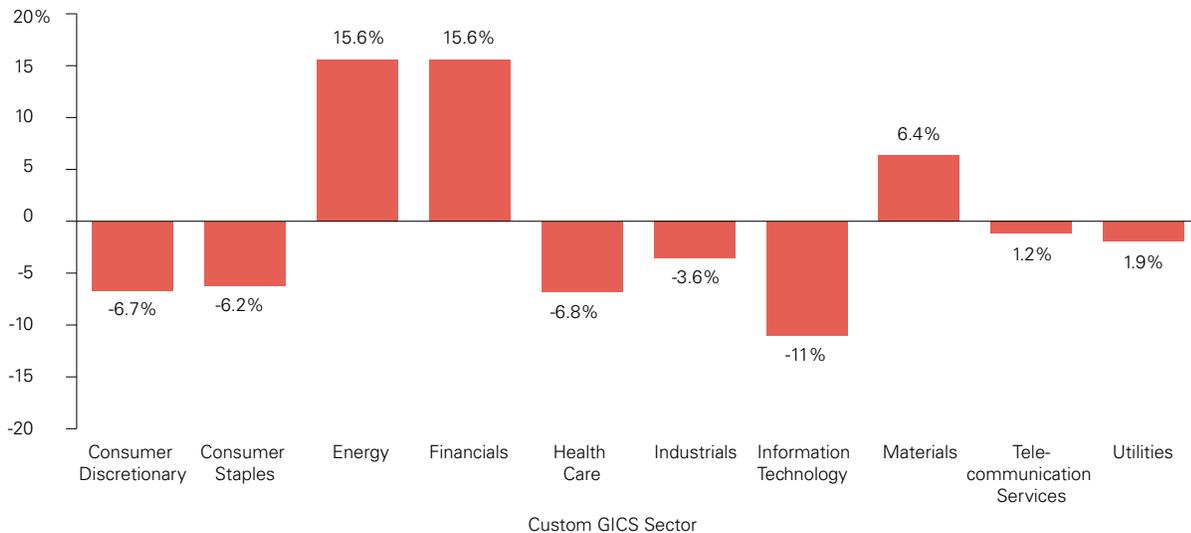
Implications of idiosyncratic concentrations

While there may be rational reasons for a home bias, the direct implication of the security and sector concentrations that can be drawn from home bias is that Canadian investors have added risk that they could have diversified away. **Figure 4** illustrates the historical risk and return of the global equity market (yellow point) along with the global index's constituent countries' returns and

volatilities (red points). Also shown is a theoretical forward-looking efficient frontier—the orange line. There are two notable takeaways: First, the Canadian stock market had higher volatility than the world market historically, but without commensurately higher return (indeed, all individual countries had greater risk than the global index). Second, in a forward-looking framework, any portfolio that diverges from the global market is, by definition, inefficient.

According to modern portfolio theory, individual securities, sectors and countries can be combined into portfolios that can have a lower level of risk per level of return than the individual assets held in isolation. This phenomenon is called the diversification benefit and occurs because the correlations among the assets in the portfolio are less than perfect and the universe of securities has expanded. For each level of risk, we can create an efficient portfolio out of the global set of securities that maximizes expected return for each level of expected risk. These portfolios are plotted as the

Figure 3: Canadian equity market has sector biases



Notes: Canada equities represented by MSCI Canada Index; global equities represented by MSCI All Country World Index. Data as of February 28, 2014. Sources: Vanguard calculations, using data from FactSet.

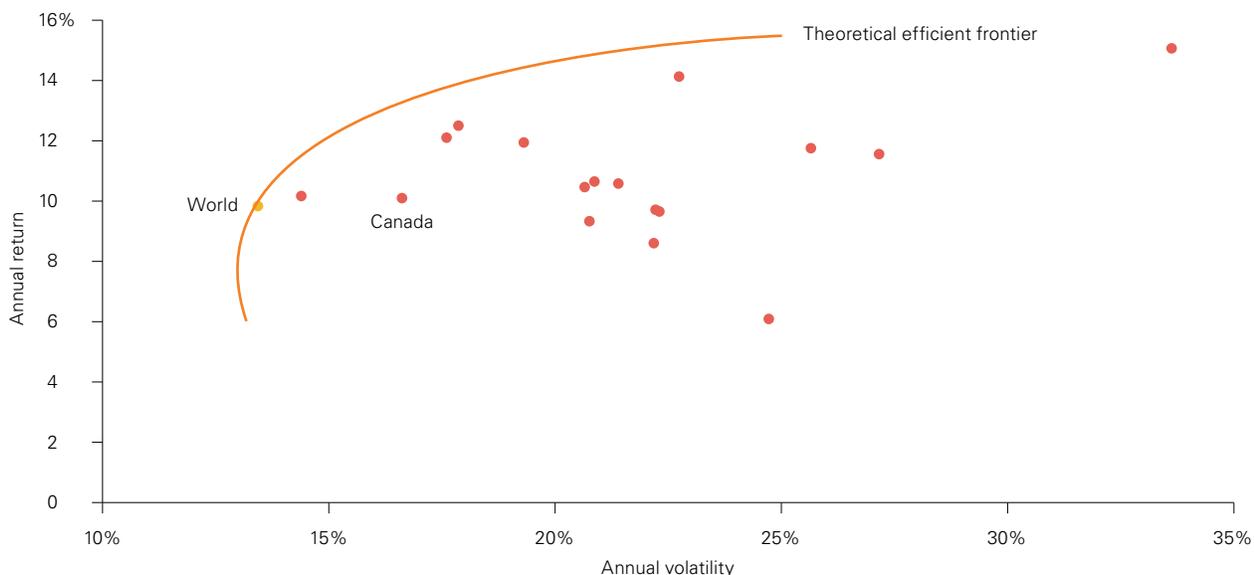
efficient frontier, the orange line. The “World” portfolio therefore represents the most efficient portfolio that investors can invest in on a forward looking basis (whether or not it actually was the most efficient is highly dependent on the time period evaluated). As a result an investor should have a strong and substantiated rationale to justify a significant amount of home bias and therefore an inefficient portfolio.

That said, a fully market proportional equity portfolio is likely beyond the scope of most Canadian investors’ comfort. Instead, most investors choose a set allocation to securities outside their domicile and maintain it through time. For many investors, such an approach represents a reasonable trade-off between the opportunity for diversification and the realities of investor preferences. The primary challenge with this approach is determining how much of an equity allocation should be focused on Canadian versus non-Canadian stocks.

The benefits of minimum-variance analysis

One methodology for identifying a reasonable allocation to global equities is to conduct an analysis evaluating the diversification impact of various combinations of Canadian and global equities over time. **Figure 5** shows the results of a minimum-variance analysis since 1985. We focused on volatility under the assumption that over the long term, returns across developed countries should be more similar than different.² In this framework, we examine the volatility impact to a 100% equity portfolio and three balanced portfolios of stocks and bonds. In each case, we begin with a portfolio 100% allocated to Canadian equities and then incrementally add exposure to global equities.³ The points to the far left correspond to the Canada point in Figure 4, a more volatile portfolio than the world in aggregate.

Figure 4: Portfolios concentrated in Canadian stocks (or any single country) are inefficient



Notes: Index returns reflect the MSCI World Index and the respective MSCI indexes for each country in the World index. The efficient frontier does not reflect actual data or returns, and is theoretical in nature. Return data covers the period December 31, 1969 through March 31, 2014. All returns in Canadian dollars. The return points are historical, while the curve is purely theoretical and forward looking.
Source: Thomson Reuters Datastream

2 Prior Vanguard research (Davis, 2012) has shown that valuation metrics such as the P/E ratio have been the most useful gauge of long-term equity returns. Therefore, given that valuations across developed markets are currently similar, we would expect future returns to be similar.

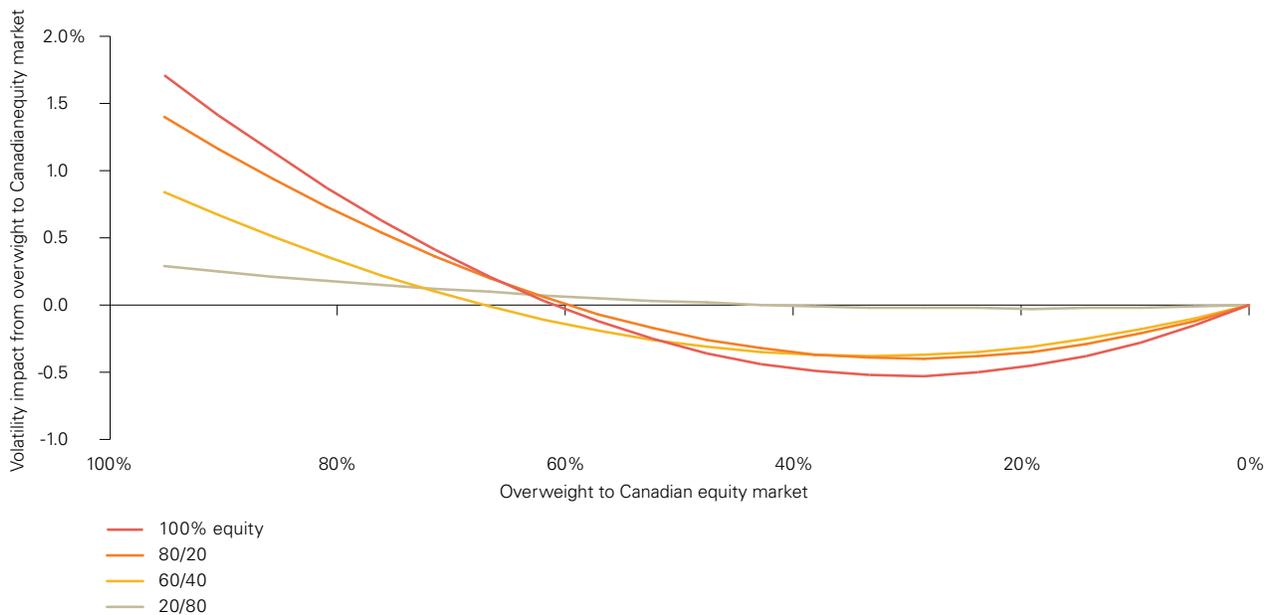
3 We define the overweight in additive terms and not multiplicative.

The downward-curving lines for the three equity-centric portfolios indicate that adding any amount of global equity exposure to a portfolio focused on Canadian equities would have lowered average volatility over the time period studied. In addition, the average home bias of Canadian investors (59% allocation to Canadian stocks) has not been the least volatile mixture over time. That point is represented by the bottom of each curve, meaning many, if not most, Canadian investors have an opportunity to further diversify their equity portfolios. That said, Canadian investors have in fact collectively maintained exposures that are less risky than the Canadian market in isolation. However, history shows that due to correlation differences between Canadian stocks and global stocks, Canadian investors would have experienced a portfolio with less volatility than the world index if they had incorporated less home bias historically. And as illustrated in Figure 4, on a forward looking basis, incorporating a significant degree of home bias means that an investor is explicitly placing a bet on the idiosyncratic risk of Canada by being off the efficient frontier.

Time varying nature of volatility and correlation

Although optimization can serve as a reference point, we recognize that this analysis is backward-looking and particularly dependent on the time period examined. For example, if we were to start the analysis of the 100% equity investor represented by the red line in Figure 5 analysis in 2000 instead of 1985, the optimal overweight to Canadian equity would have been close to 19%. If we were to start this analysis in 1985 and end it in 2000, the optimal overweight historically would be closer to 38%. Furthermore, when portfolios diversified across multiple asset classes are evaluated, the results may also change. For example, the historical minimum-volatility portfolio in Figure 5, given a 40% allocation to bonds, is different from an equity-only allocation and a portfolio more heavily invested in bonds, such as the 20% equity and 80% fixed income allocation shown. Investors should be aware of the sensitive nature of these time-varying inputs to the standard portfolio optimization.

Figure 5: An overweight to Canadian equities can increase risk



Notes: Canadian equities are represented by the MSCI Canada Index; global equities are represented by MSCI World Index through 1987 and MSCI All Country World Index thereafter. Canadian bonds are represented by the Citigroup WGBI Canada All Maturities Index through September, 2002 and Barclays Canadian Issues300MM Index thereafter. All data are through February 28, 2014. Sources: Vanguard calculations, using data from Thomson Reuters Datastream and Barclays Live.

Figure 6a displays the relationship between the trailing 12-month standard deviation of returns in Canadian and global equities. The significant spikes in relative Canadian equity volatility that occurred in the mid-1980s would have made global equities seem more attractive from a volatility reduction standpoint over that period. However, since then, Canadian equity volatility has been more in line with and sometimes below the global market.

Similar to volatility, correlations can also be time-varying. **Figure 6b** shows the rolling 36-month correlation coefficient between Canadian and global equities over time. The correlation has varied between 0.37 and 0.87 with no real trend upwards or downwards. Correlations often spike during global financial crises, as seen in 1987

and 2008 into 2009. The time-varying nature of volatilities and correlations are just some of the reasons we do not focus solely on optimization techniques to form portfolios.

Determining appropriate regional and country exposures

The analysis until this point has focused on the allocation decision between Canadian and global equities. However, some investors may consider overweighting their allocations to specific countries or regions depending on expected growth rates, returns or correlations. A notable example would be emerging markets and in particular the BRICs (Brazil, Russia, India and China). These countries have received attention in the past due to their high

Figure 6A. Volatility of Canadian equity market relative to global market has been time-varying

Rolling 12-month standard deviation of returns

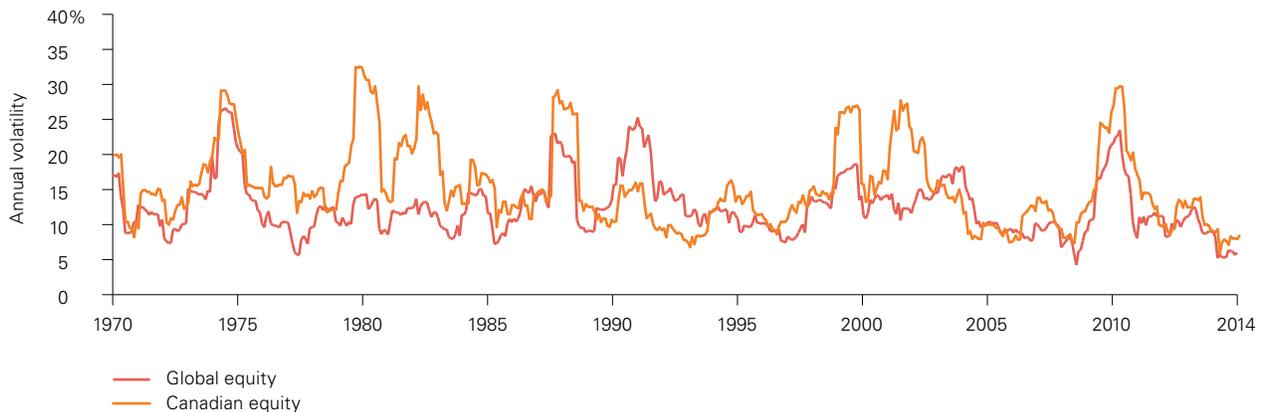


Figure 6B. Correlations can also be time-varying



Notes: Canadian equities represented by MSCI Canada Index; Global equities represented by MSCI World Index from 1970 through 1987 and MSCI All Country World Index thereafter. Data to February 28, 2014.

Sources: Vanguard calculations, using data from Thomson Reuters Datastream

historical growth rates and more recently as their growth rates have begun to slow. Prior Vanguard research (Davis, 2013) found that contrary to conventional wisdom, average cross-country correlations between long-term GDP growth and long-term stock returns have been effectively zero largely because consensus growth expectations are already priced into equity valuations. Therefore, we would caution investors from basing their allocation decisions on expectations of economic growth.

Just as broad emerging markets and the BRICs have attracted attention, so have single-country mutual funds and exchange-traded funds (ETFs). These products allow investors to make long-term strategic or tactical investments in individual countries as part of their allocation to global equities. When considering these vehicles, investors should fully appreciate that the market capitalization of individual countries, especially those characterized by relatively small markets, can be concentrated in a few sectors or even just a few companies (Zilbering, 2012). Therefore, when evaluating the merits of these dedicated allocations to markets with higher concentration and other idiosyncratic risks, investors should carefully weigh these risks against their convictions that those markets will provide superior performance.

Absent any home bias considerations, we do not believe that the higher idiosyncratic risks represented by specific countries or regions outside Canada offer adequate compensation to warrant an overweight. This is especially true considering the relationship between economic growth and market performance and the higher degree of concentration risk typically found in individual country or regional funds that can translate into heightened return volatility and increased potential for loss. At a minimum, these more concentrated positions do not offer the same level of diversification offered by a more globally diversified portfolio.

Real-world considerations

Real-world considerations may further support a lower allocation to global equities than that recommended by market proportions. Broadly, these considerations involve barriers to investment, such as limitations on the repatriation of investment income and potentially higher transaction and friction costs (for instance, commissions, opportunity costs and market-impact costs). Although barriers to cross-border investment have been falling over time, transaction and investment costs generally remain proportionally higher in many markets. This is primarily a result of liquidity differences and relatively lower market participation. Another reason for local preference is that dividends from Canadian corporations receive more favourable tax treatment than do dividends from non-domestic companies. Finally, our empirical analysis shows that significant diversification benefits have been achieved at less than fully market proportional allocations.

When combined with the behavioural considerations of home bias, these real-world factors may further support a different allocation to Canadian equities than that recommended by market proportions. Simply put, investor specific allocations may increase the likelihood that an allocation would be maintained over time even when foreign equities underperform.

Impact of currency exposure

Investments in foreign markets are exposed to fluctuations in foreign exchange rates. As a result, currency fluctuations have periodically added to or subtracted from the return in international investments for Canadian investors. For example, currency movements added 14% to the annual return of ex-Canadian equities in 2008, only to then subtract 19% in 2009.⁴

In the long term, currencies tend to reflect macroeconomic factors such as inflation and trade flows, factors that should be reflected in securities prices. However, short-term currency return is very difficult to forecast accurately, with many researchers treating it as random, uncompensated risk.⁵ Since forward-looking markets should account for any currency return that is predictable in the long-term, currency exposure is best evaluated from the perspective of risk minimization. Some investors may approach global equity exposure with a view that currency risk should be removed through a hedging program that uses derivative contracts to mitigate the effects of currency return on the portfolio.

Both equities and currency are fairly risky asset classes, meaning that the amount of currency exposure that will minimize risk will depend heavily on the correlation of foreign currency to the underlying equity portfolio. The theoretical hedging “prescription” is to keep exposure to negatively correlated currencies. However, for Canadian investors, this relationship has been quite volatile over time, as demonstrated in **Figure A**. This makes the hedging decision difficult to ascertain over time. Even with an explicit goal of minimizing portfolio risk, the ideal currency exposure is difficult to determine: sometimes it has moved against the equity market, providing diversification benefits, but other times it has not.

Figure B, contrasts the volatility impact from hedging a global equity portfolio with hedging a global fixed income portfolio. Notably, the historical volatility contribution from currency was markedly greater for global fixed income than global equity (where on average currency exposure reduced the volatility of international equities), and the benefits associated with hedging would then have been relatively modest, especially when compared to the risk reduction achieved from hedging global bonds.

The key point for investors is that, while hedging a global bond investment clearly reduces risk, the same is not true for global equities: the average result has been

opposite, but this is very uncertain and expected to be highly variable over time. Some investors may choose to approach global equity exposure on a hedged basis, while others may prefer to leave currency intact. Given the relatively modest expected reduction in risk that might be achieved from hedging, we encourage investors considering a hedging program in their global equity portfolio to be particularly mindful of the costs and operational hurdles in the implementation.

Figure A. Correlation of foreign currency to the global ex-Canadian equity market over rolling 60-month periods, 1970 to 2013

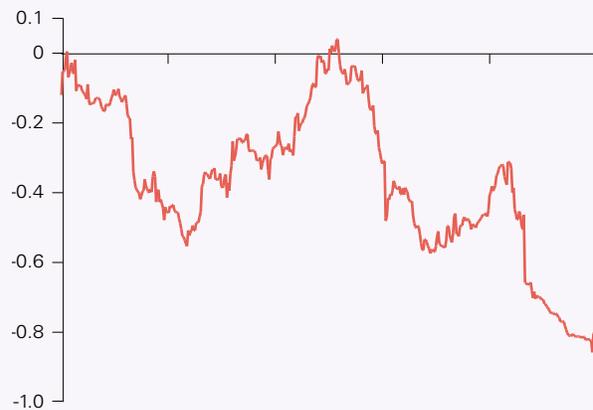


Figure B. Currency’s impact on a global equity and global bond investment, 1985 to 2013



Source: Vanguard calculations, using data from Thomson Reuters Datastream and Barclays Live. Data through February 28, 2014.

⁴ The theory of purchasing-power parity states that real returns will be the same across countries, as exchange-rate movements and inflation differentials should be identical. Interest rate parity is based on the notion that the interest rate differential between the home and foreign markets will determine the change in the exchange rate. There is considerable empirical support for these theories in the long run, but substantial research documents significant departures from a currency’s “fair value” in the short run.

⁵ Meese and Rogoff (1985) and Perold and Schulman (1988).

Conclusion

In light of empirical analysis and qualitative considerations, we have demonstrated that Canadian investors should consider increasing their exposure to global equities. Strict adherence to this principle would indicate an allocation to Canadian equities close to 4%; however, we have also demonstrated that diversification benefits can be achieved through less than fully market-proportional allocations. These higher allocations to Canadian equities may also be considered reasonable because they would allow Canadian investors to benefit from exposure to both global and Canadian equities while remaining sensitive to investor preferences. However, over time and as the global markets become more integrated and home bias less relevant, this decision may warrant revisiting. While a specific recommendation is highly client specific, we feel confident in recommending that most Canadian investors consider increasing their allocation to global stocks, thus reducing the embedded home bias in their equity portfolio.

References

- Davis, Joseph H., and Roger Aliaga-Díaz, and Charles J. Thomas, 2012. *Forecasting stock returns: What signals matter, and what do they say now?* Valley Forge, Pa.: The Vanguard Group.
- Davis, Joseph H., and Roger Aliaga-Díaz, Julieann Shanahan, Charles J. Thomas, Joanne Yoon, Ravi Tolani, 2013. *The outlook for emerging market stocks in a lower-growth world.* Valley Forge, Pa.: The Vanguard Group.
- LaBarge, Karin Peterson, 2010. *Currency Management: Considerations for the Equity Hedging Decision.* Valley Forge, Pa.: The Vanguard Group.
- Philips, Christopher B., 2012. *The role of home bias in global asset allocation decisions.* Valley Forge, Pa.: The Vanguard Group.
- Stock, James H., and Mark W. Watson, 2003. *Understanding Changes in International Business Cycle Dynamics.* NBER Working Paper No. 9859 Cambridge, Mass.: National Bureau of Economic Research.
- Zilbering, Yan and David T. Kwon, 2012. *Assessing concentration risk in individual countries.* Valley Forge, Pa.: The Vanguard Group.



Connect with Vanguard™ > vanguardcanada.ca

Investors will usually pay brokerage fees to their dealer if they purchase or sell units of ETFs on Toronto Stock Exchange (TSX). If the units are purchased or sold on TSX, investors may pay more than the current net asset value when buying units of the ETF and may receive less than the current NAV when selling them. ETFs are priced continuously and bought and sold throughout the day in the secondary market, which entails paying additional costs such as bid/ask spreads. There are ongoing fees and expenses associated with owning units of an ETF. An ETF must prepare disclosure documents that contain key information about the fund. You can find more detailed information about the Vanguard ETFs™ in these documents at www.vanguardcanada.ca. ETFs are not guaranteed, their values change frequently and past performance may not be repeated. Vanguard ETFs are managed by Vanguard Investments Canada Inc. a wholly-owned indirect subsidiary of The Vanguard Group, Inc.

The views and opinions of the individual strategists are as of the original publication date, are subject to change and may not necessarily represent the views of The Vanguard Group Inc.'s portfolio management teams and/or Vanguard Investments Canada Inc. The individual strategists may not necessarily update or supplement their views and opinions whether as a result of new information, changing circumstances, future events or otherwise. No implied or express recommendation, offer, or solicitation to buy or sell any ETFs or to adopt any particular investment or portfolio strategy is made in this material. This report is not investment and/or tax advice and it is not tailored to the needs or circumstances of individual investors.

Any security, fund, index, portfolio or market sector mentioned in this report was done so for illustrative purposes only. No representation is made regarding the advisability of investing in third-party products that utilize the indices mentioned herein. The case studies and examples in this report are designed for illustrative purposes only and do not depict actual performance. The performance of an index or fund group average is not an exact representation of any particular investment, as you cannot invest directly in an index or fund group average. The index returns do not reflect the deduction of any fund expenses, brokerage fees or bid/ask spreads which would have reduced returns.

This information has been compiled from proprietary and nonproprietary sources believed to be reliable, but no representation or warranty, express or implied, is made by The Vanguard Group, Inc., its subsidiaries or affiliates, or any other person (collectively the "Vanguard organization") as to its accuracy, completeness, timeliness or reliability. The Vanguard organization takes no responsibility for any errors and omissions contained herein and accepts no liability whatsoever for any loss arising from any use of, or reliance on, this report.

The information contained in this publication does not constitute an offer or solicitation and may not be treated as an offer or solicitation in any jurisdiction where such an offer or solicitation is against the law, or to anyone to whom it is unlawful to make such an offer or solicitation, or if the person making the offer or solicitation is not qualified to do so.

CFA® is a trademark owned by CFA Institute.

© 2014 Vanguard Investments Canada Inc.
All rights reserved.

ISSGLBEC 072014