

**FTSE**

FTSE PAPER

# International Equity Investment and the U.S. Dollar



Executive Summary:

- Many U.S. based investors seek diversification benefits by investing in international equities. Unhedged international investing however, adds foreign exchange (FX) risk in the form of an embedded currency basket, which contains long positions in foreign currencies coupled with a 100% short position in the U.S. dollar (USD).
- While financial theory argues the long-term payoff to currency exposure should be zero, currency fluctuations can have a significant effect on investment returns and volatility over short and even medium-term investment time horizons.
- Unhedged foreign investment embodies an expectation that the value of the USD will fall; a 100% hedged approach implicitly assumes the dollar will strengthen. A 50% hedged approach in contrast, represents a neutral view on the future direction of the USD; a neutral position is 50% long and 50% short.
- FTSE Russell has developed a series of international equity indexes for the USD-based investor that are 50% USD hedged to help investors evaluate their currency exposures and their hedging strategies when investing in foreign equities.

Since June 2014, the US dollar (USD) has risen significantly relative to other currencies. Improving indicators about the state of the U.S. economy, actions by the European Central Bank to stimulate the Eurozone, as well as investor expectations that the U.S. Federal Reserve will begin raising interest rates have all contributed to this stark improvement in the market's valuation of the USD. For the U.S. based investor, the strengthening of the USD is of particular concern. When foreign investments are unhedged, and as the dollar increases in value, international equity returns are reduced—sometimes dramatically. This is caused by the short position in the USD that is embedded in unhedged international investments. FTSE Russell has responded to the need for investors to analyze their positions with the launch of a new series of five international equity indexes that apply a 50% hedge to the USD.

FTSE Developed Europe Hedged 50% to USD Index

FTSE Developed ex North America Hedged 50% to USD Index

FTSE Emerging Hedged 50% to USD Index

FTSE Japan Hedged 50% to USD Index

FTSE Germany Hedged 50% to USD Index

**The currency exposures embedded in unhedged international investment.**

Why are they important?

What are their characteristic exposures?

What investment assumptions are made by the hedged and unhedged investor?

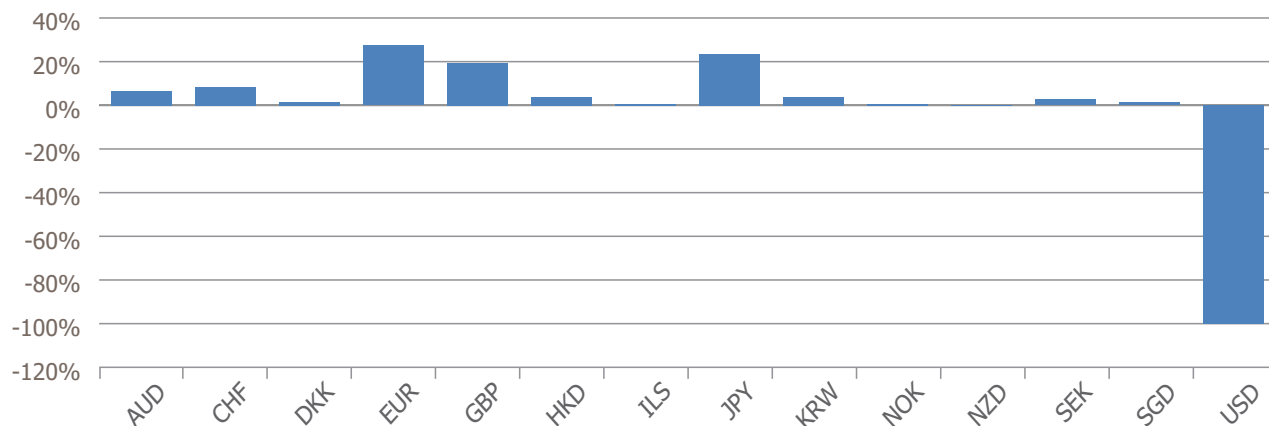
Exchange rate movements can have a significant impact on the overall returns to investing outside of the domestic market. The returns to currency can reduce, and at times eliminate the returns of foreign stocks. This would have been the real-life experience of a U.S. investor in an unhedged fund or portfolio that tracked the FTSE Developed ex North American Index in 2014, a period when the dollar rose significantly against most other developed currencies. The outcomes are reported in Table 1; currency losses for the unhedged U.S. investor over this period would have been -10.25%.

**Table 1: 2014 Currency Losses for the USD-based investor in a portfolio tracking the FTSE Developed ex North America Index**

FTSE Developed ex North America Index Return (Unhedged) 2014	FTSE Developed ex North America Index Return (100% Hedged) 2014	Impact of Currency on Unhedged Return
-4.61%	5.64%	-10.25

Source: FTSE Russell. Data for the year 2014. Past performance is no guarantee of future results. Please see the end of this paper for important legal information.

Why do we see this outcome when the USD strengthens? The unhedged index contains a separate basket of currencies; for the FTSE Developed ex NA Index, this currency portfolio consists of a long position in foreign currencies, offset by a 100% short position in the USD. Figure 1 below depicts the currency basket embedded in the FTSE Developed ex NA Index as of June 30, 2015.

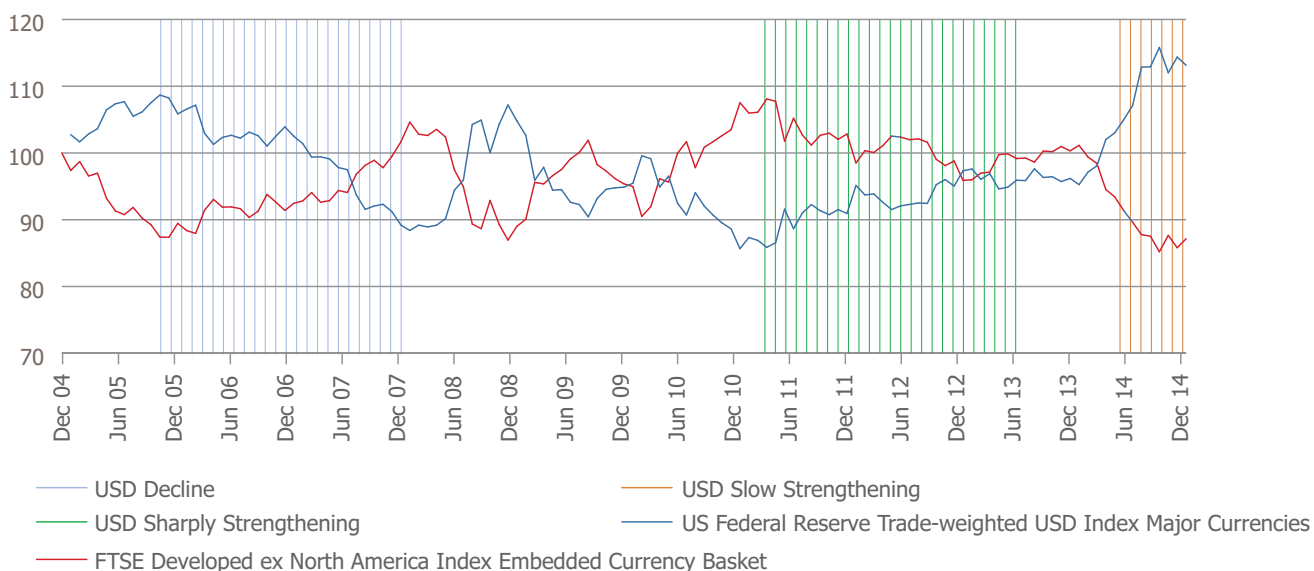


Source: FTSE Russell. Data as at June 30, 2015.

An investment that has a short exposure makes money and has a positive performance when the asset or underlying entity loses value. The opposite is also true; the short position will lose money when the underlying asset or position appreciates. We can see the history of this relationship in Figure 2, where we compare the values of the U.S. Federal Reserve Trade-weighted USD Index (major currencies) to the cumulative return of the currency basket embedded in the FTSE Developed ex NA Index (here we define the embedded currency basket return as the difference between the unhedged and the 100% hedged versions of the index). We highlight three important market states:

- USD decline from November 2005 to March 2008; note the increasing cumulative value levels of the FTSE Developed ex NA Index over this period.
- USD gradual strengthening from April 2011 through January 2014; the index experienced a slow decline in value over this time period.
- USD rose significantly from June 2014 through the end of our sample period, June 2015; the unhedged FTSE Developed ex NA Index precipitously lost value over this period.

Figure 2: Comparison of the Cumulative Growth of \$100 of the Currency Basket Embedded in the FTSE ex North America Index (Unhedged) and the Value of the USD as measured by the U.S. Federal Reserve USD Trade Weighted Index Major Currencies (beginning value reset to 100) January 2005-June 2015



Sources: FTSE Russell and U.S. Federal Reserve Bank. Data as at June 30, 2015. Past performance is no guarantee of future results. Please see the final page for important legal information.

Even though the unhedged international investor may not be consciously or knowingly predicting what the USD is going to do, they are implicitly assuming the USD will lose value. Over certain periods, for example 2014, the unhedged investor that concentrated on a short position in the USD would have experienced significantly negative investment outcomes.

What about the investor who is 100% hedged? This investor is also making an implicit assumption that the dollar will rise. This bet is the mirror image—the other side of the unhedged assumption. The performance statistics of the 100% hedged and the unhedged index reported in Table 2 demonstrate this. The hedged portfolio significantly underperformed the unhedged portfolio during the period of the dollar weakening, from November 2005 to March 2008—an average underperformance each year of 7.5% with a slightly increased level of volatility.

**Table 2: Performance statistics for the FTSE Developed ex North America Index, 100% hedged and unhedged to the USD over three market states**

<b>Falling Dollar Nov 2005–March 2008</b>	<b>FTSE Developed ex NA 100% Hedged USD</b>	<b>FTSE Developed ex NA Unhedged</b>
Sharpe Ratio	0.3	0.9
Annualized Return, %	7.6	15.1
Annualized StdDev %	12.2	11.5
Max Drawdown Return %	-19.3	-14.2
<b>Gradually Strengthening Dollar April 2011 to January 2014</b>	<b>FTSE Developed ex NA 100% Hedged USD</b>	<b>FTSE Developed ex NA Unhedged</b>
Sharpe Ratio	0.7	0.4
Annualized Return, %	8.1	5.9
Annualized StdDev %	12.8	17.3
Max Drawdown Return %	-18.4	-23.0
<b>Sharply Strengthening Dollar June 2014 to June 2015</b>	<b>FTSE Developed ex NA 100% Hedged USD</b>	<b>FTSE Developed ex NA Unhedged</b>
Sharpe Ratio	1.2	-0.2
Annualized Return, %	10.8	-2.5
Annualized StdDev %	8.6	9.8
Max Drawdown Return %	-4.4	-9.2

Source: FTSE Russell. Data as at June 30, 2015. Past performance is no guarantee of future results. Please see the final page for important legal information.

### **How do international investors decide on their approach to hedging their currency exposure?**

We have shown that currency exposure is an important determinant of performance in international investing, and decisions about whether to hedge and how much to hedge embody views, or forecasts, on the future performance of the domestic currency (here the USD) versus other major currencies. What else does an investor need to know to make an informed decision about currency? What insights are there from financial theory? From academic research?

Traditionally, discussions in relation to currency hedging focused on the two extremes: the fully hedged portfolio which eliminates foreign exchange exposure and the unhedged portfolio which leaves currency exposure unmanaged. As we have shown above, these extremes may not be ideal for many investors. In this section we briefly summarize the arguments supporting common hedge ratios (here defined as how much or what percentage of the total currency exposure is to be hedged) from a survey of the academic literature.

### 1) The 100% hedged ratio (fully hedged).

Andre Perold and Evan Schulman<sup>1</sup> make an argument for full hedging in an influential paper, based on the position that currency exposure can be removed without sacrificing return in the long run. They argue that currency hedging has a long-term expected return of zero, and thus investors can achieve substantial risk reduction at no loss of expected return. The USD appreciates some years and depreciates relative to foreign currencies in others. Proponents of 100% hedging strategies argue that unless participants have the ability to time these currency movements, they will be best served by a completely hedged approach. We have demonstrated however, that the fully hedged position is in fact implicitly taking a position on the USD over short and even medium term horizons. We also note that a 100% hedge does not always reduce index volatility relative to the unhedged index—during the period of the falling dollar, November 2005 to March 2008, the hedged index had a higher standard deviation and a higher maximum drawdown (Table 1).

### 2) The 0% hedged ratio (unhedged).

0% hedging leaves the investor with full currency exposure, so total returns as we have seen, will include both asset and FX movements. Kenneth Froot<sup>2</sup> makes an argument for unhedged portfolios on the basis that currency hedging does not reduce volatility for long horizons. Froot does concede that hedging can substantially reduce risk in the short-term, but shows that in the long run many fully hedged international investments actually have greater return variance than their unhedged counterparts. According to the theory of Purchasing Power Parity (PPP), currency returns are mean reverting over a long investment horizon and investors should maintain unhedged positions. The proponents of this approach contend that, considering the arguments above, the cost of hedging isn't worthwhile. Again, our examples above show that the unhedged position has very concentrated exposures to currency, which can have and have had significant impacts on investment returns over reasonable investment horizons.

### 3) The somewhere between 0 and 100% hedge ratio.

The preferences and priorities of investors can be quite different, further complicating the hedge ratio decision. Fortunately, investors are not forced to choose between fully hedged or unhedged. In fact, transaction costs aside, there are an infinite number of hedging ratios that can be implemented within an international portfolio. Fisher Black<sup>3</sup> derives a formula for an optimal hedge ratio dependent upon the expected return of the market, the market's volatility and the volatility of the exchange rate. Black concludes this optimal hedge ratio often falls between the two extremes of 0% and 100%, and changes through time based on the inputs.

### 4) The 50% hedge ratio.

Studies have shown that a relatively simple alternative, a 50% hedge ratio, can provide substantial volatility reduction without having to give up the entire potential return from foreign currencies. Gardner and Wuilloud<sup>4</sup> make an interesting case for the 50% hedging ratio by investigating the "regret" that results when a hedge implemented based on a mean-variance framework is outperformed by a simple alternative strategy. More broadly, regret results when investors are hedged and foreign currencies rise, and when unhedged and foreign currencies fall. The authors find that moving from the mean-variance optimal hedge ratio to a 50% strategy helps to avoid extreme regret without sacrificing much expected risk-adjusted return. The authors recognize that investors with a long time horizon experience less regret reduction than those with a shorter time horizon.

<sup>1</sup> Perold, André, and Evan C. Schulman. "The Free Lunch in Currency Hedging: Implications for Investment Policy and Performance Standards." *Financial Analysts Journal* 44, no. 3 (May/June 1988).

<sup>2</sup> Froot, K. (1993) "Currency Hedging over Long Horizons", *National Bureau of Economic Research*, Cambridge, MA.

<sup>3</sup> Black, F. (1989) "Universal Hedging: Optimising Currency Risk and Reward in International Equity Portfolios", *Financial Analysts Journal*, July-August.

<sup>4</sup> Gardner, G. and Wuilloud, T. (1994) "The Regret Syndrome in Currency Risk Management: A Closer Look", *Russell Research Commentary*.

Gorman, Qian and Surz<sup>5</sup> argue in favour of a 50% currency hedge. They make the following observations:

- currency impacts on both returns and volatility are too great to ignore;
- currency movements are too hard to predict and to time;
- the 50% hedged position represents neutrality (embodies no forecasts);
- the impact on returns and risk of a 50% hedged approach are non-linear in terms of volatility—in other words, generally over half the volatility improvement is realized with a 50% hedge ratio, and;
- this volatility reduction allows for larger allocations to international stocks within a portfolio's risk budget.

### The 50% hedge ratio: further considerations and historical performance

Gorman, Zian and Surz's observations supporting a 50% currency hedge ratio for international investments merit a closer look. We have already demonstrated how much embedded currency exposures can impact the level and volatility of returns. We have reported return behavior that supports the contention that the 100% hedged as well as the 0% hedged positions embody a forecast of the performance of the home currency (here again the USD) relative to other currencies. Indeed, we find Gorman et. al. persuasive in that any position other than a 50% hedge embodies a currency forecast; a 50% hedged portfolio represents a neutral stance on the domestic currency.

Currency fluctuations are very difficult to forecast and even more difficult to time, as Gorman, et. al., stress. Although financial theory states that currencies will eventually converge to purchasing power parity (PPP) levels, empirically currency values can and do diverge for very long periods of time from their PPP values. Using a PPP based forecasting approach may in the very long run turn out to be correct, but investors may face more short term consequences as they wait for PPP convergence to occur.

Central banks can have a significant impact on currency behavior as they influence exchange rates, the supply of money and short-term interest rates to manage their economies. Forecasting central bank actions in terms of content and timing is a very difficult task, with many significant market participants unaware of sudden central bank actions. A case in point here is the Swiss Central Bank removal of support for the exchange rate peg of the CHF (the Swiss Franc) to the Euro in January 2015—a policy reversal which created havoc in the currency markets. This occurred one week after the Swiss Central Bank had assured markets that the pegged rate would continue to be supported. Major banks and investment companies suffered significant losses because they could not predict that this action would occur when it did.<sup>6</sup>

Investors with conviction as to their ability to forecast currency may of course take positions reflecting those forecasts. But in the absence of such conviction—such ability—they may prefer an equal weighted or neutral approach to exposures. In the case of a home currency, as described above, some consider this is best represented by the 50% hedge ratio in international investment. In Table 3, we report key statistics for this neutral currency exposure as represented by the 50% hedged FTSE Developed ex-North America Index.<sup>7</sup> We compare the 50% hedged index returns to the 100% Hedged and 0% Hedged alternatives over our entire sample period (January 2005-June 2015) as well as for our three market states of a Falling Dollar, Gradually Strengthening Dollar and Sharply Strengthening Dollar.

<sup>5</sup> Gorman, S., Qian, E. and Surz, R. (2000) "International Benchmarks In Support of a 50% Hedge Ratio", *Journal of Investing*, Vol. 9, No. 2.

<sup>6</sup> See, for example, I. Iosebashvili, A. Ackerman and A. Wexler "Surge of Swiss France Triggers Hundreds of Millions in Losses," *Wall Street Journal*, January 16 2015: <http://www.wsj.com/articles/swiss-franc-move-cripples-currency-brokers-1421371654>.

In the far right columns of Table 3, first we compute the difference between the outcomes of the 100% hedged and the 50% hedged indexes; second the difference between the outcomes of the 50% hedged and the 0% hedged indexes. Results vary across the different time periods of analysis and market states. The most consistent result we see in Table 3 is in line with the observations of Gorman, et. al., in that the volatility improvement contributed by moving to a 50% hedged position was greater than 50%. Here, we reference the numbers highlighted in yellow in the chart. During the three periods where the volatility of the 100% hedged index was less than the 0% hedged (Total Period, Gradually Strengthening Dollar,

and Sharply Strengthening Dollar) the reduction in volatility that would have been achieved via a 50% hedged index was measurably larger than the volatility reduction moving from a 50% hedged to a 100% hedged strategy. It is striking that during the second period—the Falling Dollar—when the 100% hedged index exhibited more volatility than the unhedged, the volatility of the 50% hedged index was almost equal to the unhedged. With a 50% hedge ratio, there was an increase of 4 basis points (bp) of volatility, moving to a 100% Hedge ratio added another 69 bp of volatility (annualized standard deviation). Again, these results are all time period dependent, but do align with the results in Gorman et. al.<sup>8</sup>

<sup>7</sup> The FTSE Developed 50% USD Hedged Indexes were launched on 23 July 2015. Performance has been backfilled to January 2015 based on transparent, consistent rules-based hedging methodology. Please see the Appendix for performance statistics for the FTSE Developed Europe 50% USD Hedged Index and the FTSE Japan 50% USD Hedged Index.

<sup>8</sup> Case studies for Japan and Developed Europe are found in the appendix.



**Table 3: Performance statistics for the FTSE Developed ex North America Index, 50% hedged, 100% hedged and unhedged to the USD over three market states as well as the total sample period**

Total Period Jan 2005–June 2015	FTSE Developed Ex North America Index 100% Hedged USD	FTSE Developed Ex North America Index 50% Hedged to USD Index	FTSE Development Ex North America Index 0% Hedged	100% Hedged – 50% Hedged	50% Hedged – 0% Hedged
Sharpe Ratio	0.5	0.4	0.3	0.1	0.1
Annualized Return, %	7.2	6.4	5.5	0.8	1.0
Annualized StdDev %	14.3	15.8	18.0	-1.5	-2.2
Max Drawdown Return %	-50.0	-53.2	-56.4	3.2	3.2
Falling Dollar Nov 2005–March 2008	FTSE Developed Ex North America Index 100% Hedged USD	FTSE Developed Ex North America Index 50% Hedged to USD Index	FTSE Development Ex North America Index 0% Hedged	100% Hedged – 50% Hedged	50% Hedged – 0% Hedged
Sharpe Ratio	0.3	0.6	0.9	-0.3	-0.3
Annualized Return, %	7.6	11.3	15.1	-3.7	-3.8
Annualized StdDev %	12.2	11.5	11.5	0.7	0.0
Max Drawdown Return %	-19.3	-16.5	-14.2	-2.8	-2.3
Gradually Strengthening Dollar April 2011 to January 2014	FTSE Developed Ex North America Index 100% Hedged USD	FTSE Developed Ex North America Index 50% Hedged to USD Index	FTSE Development Ex North America Index 0% Hedged	100% Hedged – 50% Hedged	50% Hedged – 0% Hedged
Sharpe Ratio	0.7	0.5	0.4	0.1	0.1
Annualized Return, %	8.1	7.0	5.9	1.1	1.2
Annualized StdDev %	12.8	14.8	17.3	-2.0	-2.5
Max Drawdown Return %	-18.4	-20.7	-23.0	2.3	2.3
Sharply Strengthening Dollar June 2014 to June 2015	FTSE Developed Ex North America Index 100% Hedged USD	FTSE Developed Ex North America Index 50% Hedged to USD Index	FTSE Development Ex North America Index 0% Hedged	100% Hedged – 50% Hedged	50% Hedged – 0% Hedged
Sharpe Ratio	1.2	0.5	-0.2	0.7	0.7
Annualized Return, %	10.8	4.0	-2.5	6.8	6.5
Annualized StdDev %	8.6	8.6	9.8	0.0	-1.2
Max Drawdown Return %	-4.4	-3.6	-9.2	-0.8	5.6

Source: FTSE Russell. Data as at June 30, 2015. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. Please see the end of this paper for important legal information.

## Conclusion

Unhedged international investing brings with it significant currency exposure, namely embedded long positions in foreign currencies coupled with a very large short position in the domestic currency, here the USD. Completely hedging currency exposures results in an implicit long position in the domestic currency. There may be no single hedge ratio that satisfies all investors because the heterogeneous outlooks and risk tolerances of investors can lead participants to implement vastly different strategies. Currency fluctuations are notoriously difficult to forecast however, and some academics have supported a 50% hedge ratio, suggesting that it represents the neutral position, has been shown to minimize investor regret due to erroneous forecasts and historically has exhibited attractive asymmetric risk characteristics. The FTSE 50% Hedged Index Series has been designed to assist investors in understanding and evaluating the currency exposures of their international equity investments.

## Appendix 1: FTSE Japan

Shortly after beginning his second term in December 2012, Prime Minister Shinzō Abe launched an ambitious plan to bolster Japan's economy and remedy nearly 20 years of stagnation. To generate modest inflation and make exports more competitive, the plan called for the intentional devaluing of the yen, achieved by printing more money.

At the same time positive economic data out of the U.S. spurred discussions and calls for the U.S. Federal Reserve to end its stimulus program and potentially raise interest rates. The diverging policies of these two large central banks underpinned a period of a strengthening dollar, with a recent significant increase from June 2014 to June 2015 bringing the USD to a 13 year high versus the Yen. Table A1 illustrates the impact the currency movement has had on the FTSE Japan Index from the perspective of a U.S. based investor over three market states for the USD/JPN. Since 2012, the beginning of 'Abenomics', the 100% hedged index outperformed the unhedged version by nearly 20%. In all three market states we observe the same asymmetrical volatility outcomes as with the FTSE Developed ex-NA index discussed in the body of the paper—a 50% hedged strategy reduced volatility more than 50%.

**Table A1: Performance statistics for the FTSE Japan Index, 100% hedged and unhedged to the USD over three market states as well as total sample period**

<b>Total Period Jan 2005–June 2015</b>	<b>FTSE Japan 100% Hedged USD</b>	<b>FTSE Japan 50% Hedged USD</b>	<b>FTSE Japan Unhedged USD</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	0.3	0.3	0.2	0.1	0.1
Annualized Return, %	6.0	4.9	3.6	1.1	1.3
Annualized StdDev %0.5	18.9	16.4	15.1	2.4	1.3
Max Drawdown Return %	-56.8	-51.3	-46.9	-5.5	-4.4
<b>Falling Dollar June 2007 – January 2012</b>	<b>FTSE Japan 100% Hedged USD</b>	<b>FTSE Japan 50% Hedged USD</b>	<b>FTSE Japan Unhedged USD</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	-0.7	-0.6	-0.3	-0.2	-0.3
Annualized Return, %	-15.4	-10.9	-6.6	-4.5	-4.4
Annualized StdDev %	20.8	18.7	17.9	2.1	0.8
Max Drawdown Return %	-56.5	-51.3	-46.0	-5.2	-5.3
<b>Dollar Rise September 2012 to June 2015</b>	<b>FTSE Japan 100% Hedged USD</b>	<b>FTSE Japan 50% Hedged USD</b>	<b>FTSE Japan Unhedged USD</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	2.1	1.9	1.4	0.2	0.5
Annualized Return, %	34.9	25.3	16.2	9.6	9.2
Annualized StdDev %	14.6	12.5	11.4	2.1	1.1
Max Drawdown Return %	-10.6	-9.2	-7.8	-1.4	-1.4
<b>Significantly Rising Dollar June 2014 – June 2015</b>	<b>FTSE Japan 100% Hedged USD</b>	<b>FTSE Japan 50% Hedged USD</b>	<b>FTSE Japan USD</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	2.9	2.4	1.5	0.4	1.0
Annualized Return, %	34.7	24.1	14.2	10.6	10.0
Annualized StdDev %	10.6	9.1	9.2	1.5	-0.1
Max Drawdown Return %	-2.8	-2.1	-5.1	-0.7	3.0

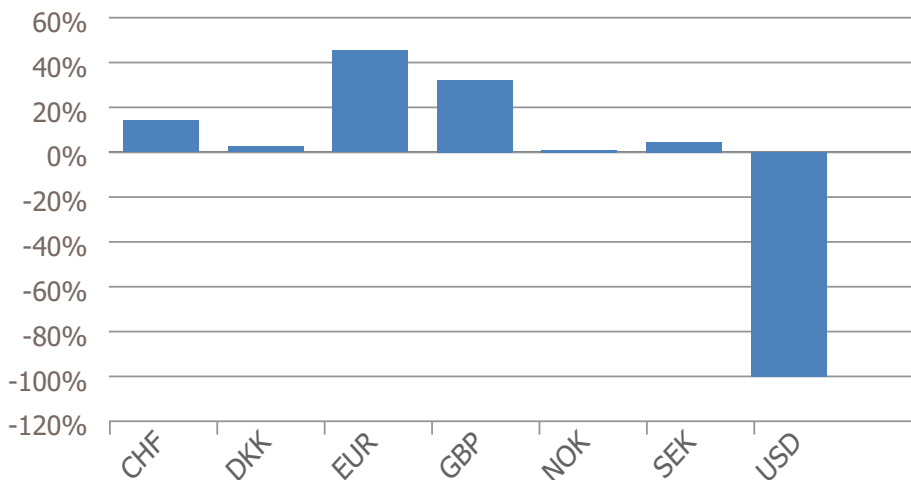
Source: FTSE Russell. Data as at June 30, 2015. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. Please see the end of this paper for important legal information.

### Appendix 2: FTSE Developed Europe

In September 2014, the European Central Bank (ECB) surprised the markets with a cut in interest rates meant to boost economic activity and prevent deflation. Lower interest rates can encourage borrowing, spending and investing. Additionally, lower interest rates can lead to a weaker currency. In March 2015 the ECB laid out plans for a \$1.2 trillion stimulus program that called for scheduled purchases of sovereign bonds from Eurozone countries. This created additional demand for bonds, driving prices up and thus lowering interest rates further.

The FTSE Developed Europe Index contains a separate basket of currencies, which for a U.S. based investor consists of a long position in foreign currencies, offset by a 100% short position in the USD. Figure A2 below depicts the currency basket embedded in the FTSE Developed Europe Index as of June 30, 2015. With nearly 50% in the Euro, the diverging policies of the ECB and U.S. Federal Reserve had a large impact on the unhedged index, as illustrated in Table A2. Again, the volatility reduction, as measured by standard deviation, achieved with a 50% hedged approach is greater than 50%.

Figure A2: Embedded Currency Basket FTSE Europe Index June 30, 2015 (U.S. based investor perspective)



Source: FTSE Russell. Data as at June 30, 2015.  
Past performance is no guarantee of future results.

**Table A2: Performance statistics for the FTSE Developed Europe Index over three market states as well as total sample period**

<b>Total Period Jan 2005–June 2015</b>	<b>FTSE Developed Europe Index 100% Hedged USD</b>	<b>FTSE Developed Europe 50% Hedged to USD</b>	<b>FTSE Developed Europe Index</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	0.5	0.4	0.3	0.1	0.1
Annualized Return, %	7.6	6.7	5.5	0.9	1.2
Annualized StdDev %0.5	14.7	16.8	19.9	-2.2	-3.0
Max Drawdown Return %	-49.4	-54.2	-58.9	4.9	4.7
<b>Falling Dollar Nov 2005–March 2008</b>	<b>FTSE Developed Europe Index 100% Hedged USD</b>	<b>FTSE Developed Europe 50% Hedged to USD</b>	<b>FTSE Developed Europe Index</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	0.4	0.7	1.1	-0.4	-0.3
Annualized Return, %	8.5	13.3	18.1	-4.7	-4.8
Annualized StdDev %	12.0	11.7	12.1	0.3	-0.5
Max Drawdown Return %	-17.7	-15.2	-14.7	-2.5	-0.6
<b>Gradually Strengthening Dollar April 2011 to January 2014</b>	<b>FTSE Developed Europe Index 100% Hedged USD</b>	<b>FTSE Developed Europe 50% Hedged to USD</b>	<b>FTSE Developed Europe Index</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	0.7	0.5	0.4	0.1	0.1
Annualized Return, %	8.3	7.8	7.1	0.5	0.7
Annualized StdDev %	13.2	16.1	19.5	-2.8	-3.4
Max Drawdown Return %	-20.3	-23.6	-26.9	3.3	3.3
<b>Significantly Rising Dollar June 2014 to June 2015</b>	<b>FTSE Developed Europe Index 100% Hedged USD</b>	<b>FTSE Developed Europe 50% Hedged to USD</b>	<b>FTSE Developed Europe Index</b>	<b>100% Hedged – 50% Hedged</b>	<b>50% Hedged – 0% Hedged</b>
Sharpe Ratio	0.6	0.0	-0.5	0.6	0.5
Annualized Return, %	5.9	-0.4	-6.5	6.3	6.1
Annualized StdDev %	10.1	10.1	11.6	0.0	-1.4
Max Drawdown Return %	-5.0	-6.1	-11.0	1.1	4.9

Source: FTSE Russell, data as at June 30, 2015. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. Please see the end of this paper for important legal information.

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<b>London</b>	+44 (0) 20 7866 1810	<b>San Francisco</b>	+1 888 747 FTSE (3873)	<b>Toronto</b>	+1 416 572 7979
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