

HEDGE OF LEAST REGRET

Benefits of Managing International Equity Currency Risk with a 50-Percent Hedging Strategy

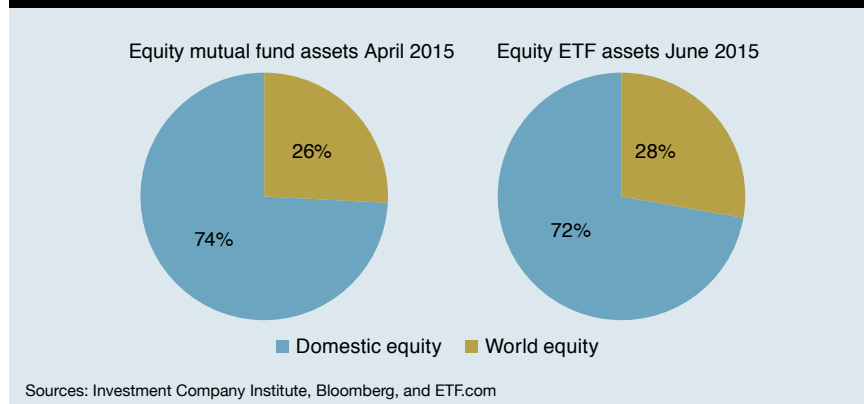
By Robert Whitelaw, PhD, and Salvatore J. Bruno

The potential benefits of international equity investing include participation in the fortunes of many of today's global industry leaders and greater portfolio diversification than can be derived by investing in U.S. securities alone. Approximately two-thirds of global equity market capitalization resides outside the United States, as do almost half of the top 100 firms by market capitalization. Still, many U.S. investors appear to be underweight international equities in their portfolio allocations.

For those seeking exposure to international equities, it is important to understand how exchange-rate movements can affect equity returns in these markets. Currency hedging offers a way to invest internationally while managing against the risk a stronger U.S. dollar can impose on foreign-based equity returns. However, hedging also can reduce those returns when the U.S. dollar falls. History shows that the better-performing strategy can vary from year to year and is difficult to predict. What's more, the best-performing strategy in one equity market might not be the best approach in another market during the same time period. In either case, whether investors utilize a fully hedged or non-hedged strategy, it is important to understand that they are effectively making a currency call that is inherently difficult to time.

Fortunately, there is an alternative to the all-or-nothing approaches many investors have taken historically to hedging currency exposure in their international portfolios. A balanced 50-percent currency-hedged portfolio

Figure 1: Global Equity Market Capitalization vs. U.S. Mutual Fund and ETF Equity Assets



may offer a reasonable alternative approach. In fact, our research shows that half-hedged portfolios reduce the potential risk of misreading extreme currency movements, in either direction, while lowering the inherent volatility in certain key markets, offering a hedge of least regret across a broad range of currency scenarios. In addition, we believe an exchange-traded fund (ETF) structure offers an efficient and attractive vehicle to implement a 50-percent currency-hedged international equity strategy.

A Strategic Allocation, Still Skewed by Home-Country Bias

The case for international equities as a strategic long-term portfolio allocation remains compelling. Approximately two-thirds of today's global equity market capitalization resides outside the United States, including some of the world's most famous—and most profitable—brands. Non-U.S. industry leaders can be found in

a variety of industries, including pharmaceuticals, semiconductors, telecommunications, automobiles, oil and gas, food and beverage products, and retail.

According to the latest National Association of College and University Business Officers (NACUBO)–Commonfund Study of Endowments, the average allocation by participating institutions to international equities in 2014 was 19 percent, up from 18 percent in 2013. The share of equity mutual fund assets in domestic equities is 74 percent compared to 26 percent for world equities, with a similar breakdown in ETFs (see figure 1). Yet, many U.S. investors continue to exhibit a clear home-country bias in their asset class allocations.

The proper allocation to international equities will vary by investor, but the benefits generally center on enhanced portfolio diversification and access to dynamic

investment opportunities not available by limiting one's opportunity set to only U.S. securities. Moreover, now may be an attractive time to consider increasing one's allocation to international equities. The six-year bull market in U.S. equities has escalated S&P 500 Index valuations above the historical average. In contrast, international equity valuations remain below the historical average, and in some markets, such as Japan, valuations are near the low end of the historical range (see figure 2). Add in easy monetary policies for many of these countries, and a long-term investment thesis begins to emerge.

Currency—The Other Source of Risk and Return

International equity investing typically captures two return streams for U.S. investors: equity market returns and currency returns. Although average currency returns of developed countries are widely believed to revert toward zero percent over very long time horizons, fluctuations can be dramatic during shorter periods. Figure 3 illustrates the calendar year total returns for the FTSE Developed International ex North America Index in local currency compared to U.S. dollar returns, as well as the cumulative impact that currency movements had on performance. The wide gaps in some of these years substantially increased volatility and materially affected returns, at times negatively and, at others, positively.

The Currency Conundrum

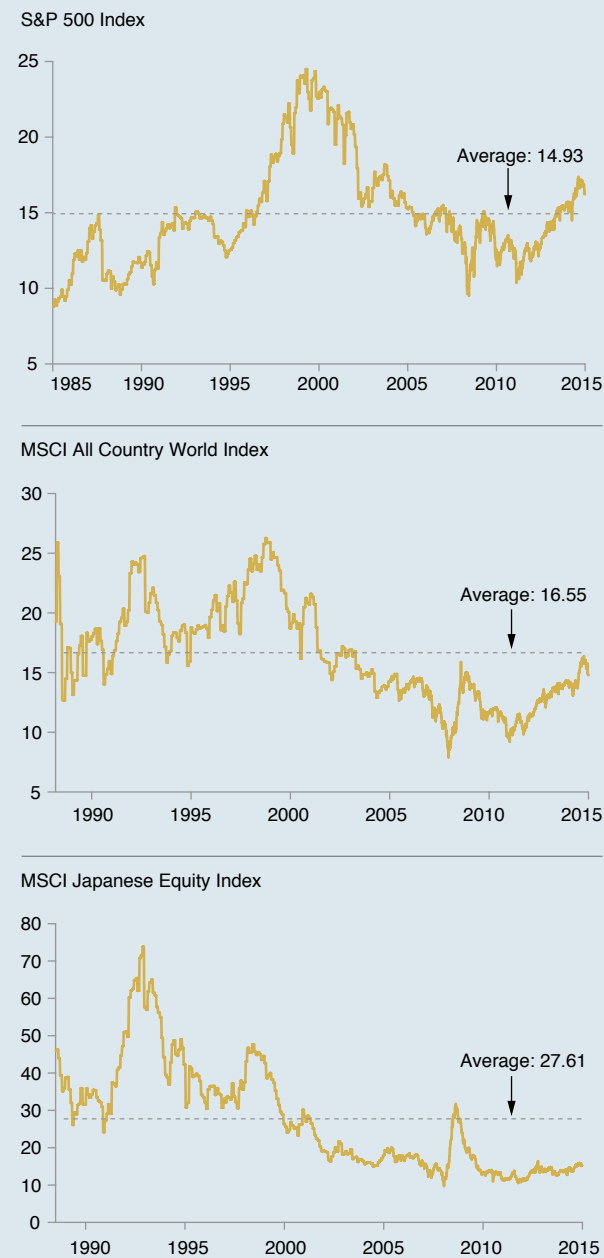
Currency hedging can help manage the risks of large currency movements, but the extremes of either 100-percent hedged or 100-percent unhedged strategies introduce an inherent view on the direction of the U.S. dollar.

The challenges around this are twofold. First, a fully hedged portfolio historically has curtailed returns when the U.S. dollar weakened, relative to international currencies, whereas an unhedged portfolio historically has underperformed when the U.S. dollar strengthened.

Unfortunately, it is notoriously difficult to predict currency movements, which can make it challenging to anticipate when a currency-hedged or -unhedged strategy might be the better option. Figure 4 compares the annual relative gain/loss of currency-hedged and -unhedged returns for the FTSE Developed Europe Index in each of the past 30 years. The fully currency-hedged returns underperformed slightly more than 50 percent of the time.

Second, whereas a fully hedged currency position often is assumed to help mitigate volatility, it actually can increase an investment's risk profile, depending on the specific dynamics of the underlying currencies. Figure 5 shows how various degrees of currency hedging affected index volatility across the 10-year period ended in 2014. Increasing the currency-hedged percentages steadily reduced volatility in the developed European and the broader developed international markets; however, the reverse held true for Japanese markets.

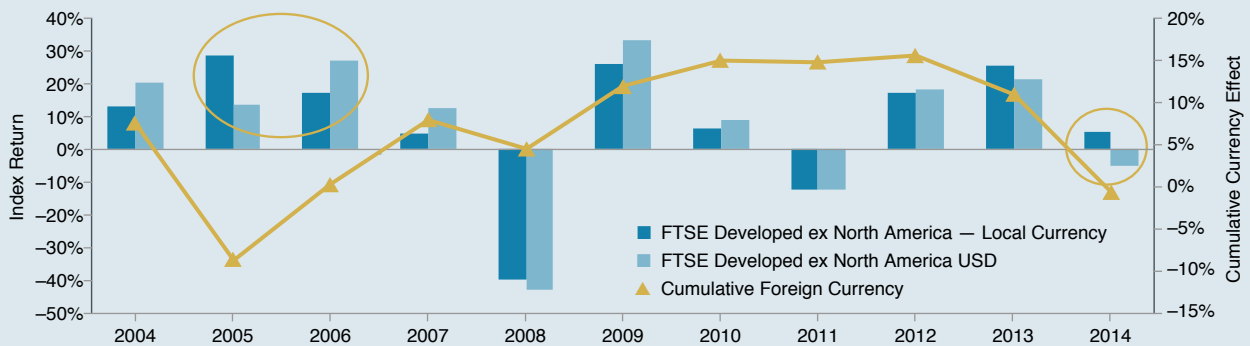
Figure 2: Historical Price-to-Earnings Ratio Averages



Source: Thomson Reuters Datastream, New York Life Investments as of March 31, 2015. P/E ratio measures the average ratio of market values and per-share earnings for companies in each index. A forecast of earnings 12 months ahead, based on a survey of analysts, is used. There is no guarantee that the forecast will be realized.

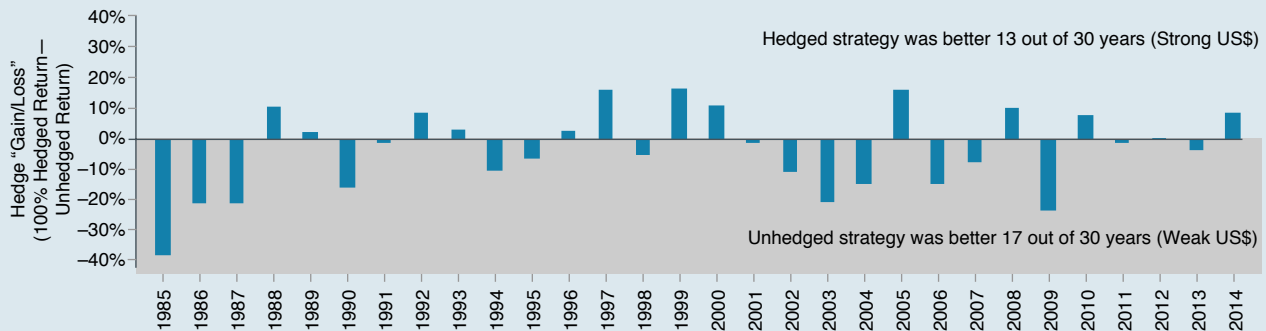
The variation in these results is due to differences in correlation between the currency return and the equity market return in local currency. This correlation has been strongly negative for Japan; therefore, the unhedged currency exposure has provided a natural hedge against fluctuations in the Japanese stock market. Hedging currency risk effectively reduces this natural hedge, and thus, volatility rises as the currency hedge percentage increases.

Figure 3: Comparison of FTSE Developed International ex North America Returns in Local Currency vs. USD, January 2004–December 2014



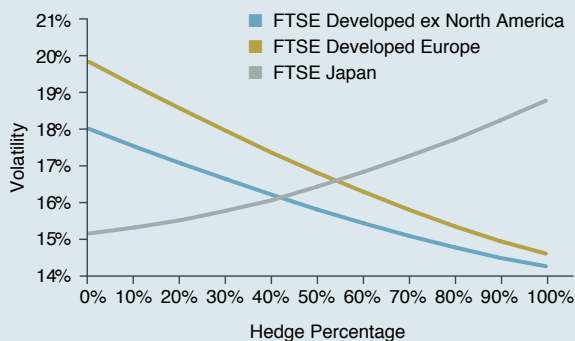
Source: Morningstar, January 1, 2004–December 31, 2014. Past performance is no guarantee of future results.

Figure 4: FTSE Developed Europe Index 100% Hedged vs. Unhedged Currency, 1985–2014



Source: The hedged FTSE Developed Europe Index is used from 2005–2014. For 1985–2000, the MSCI Europe Index (with estimated hedging costs and FX impact incorporated) is used. For 2000–2004, the FTSE Developed Europe Index with estimated hedging costs and FX impact is used. Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

Figure 5: Volatility as a Function of Fraction Hedge, 2004–2014



Source: FTSE, as of April 30, 2015. Volatility is measured by standard deviation, which measures how widely dispersed a fund's returns have been over a specified period of time. A high standard deviation indicates that the range is wide, implying greater potential for volatility. Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

The correlation has been positive in the markets covered by the other two indexes, which means that currency exposure has added to equity risk and hedging this exposure has reduced volatility.

The Hedge of Least Regret

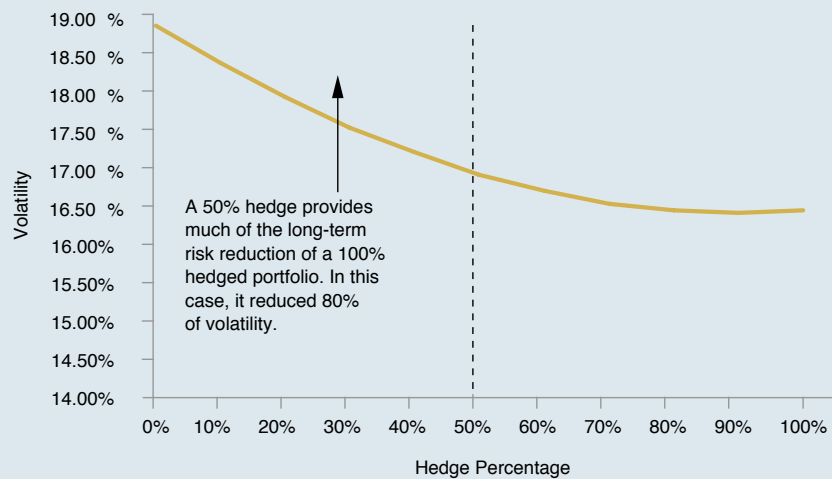
Addressing currency risk, however, does not require an all-or-none approach. Our research into the interaction between currencies and equity returns shows that a neutral 50-percent currency hedge on an international equity portfolio can offer a pragmatic balance for buy-and-hold investors. It can help gain international equity exposure and mitigate the effect of exchange-rate fluctuations, without being actively bullish or bearish on the direction of the U.S. dollar or foreign currencies.

Because the relationship between volatility and the amount of hedging is not linear in nature, there likely will be times when a 50-percent currency hedge captures a large percentage of the long-term risk reduction benefits of a fully hedged or unhedged portfolio.

Figure 6 illustrates how 50-percent currency hedging, applied to the FTSE Developed Europe Index over the past 30 years, lowered volatility by 80 percent, versus leaving currency risk completely unhedged.

A 50-percent currency-hedged international equity strategy also may help to provide a stabilizing effect on relative performance. As discussed earlier, there has been a frequent, often unpredictable, rotation between when a 100-percent currency-hedged or completely unhedged approach has outperformed. Table 1 highlights that the 50-percent hedged route offers a more prudent return path that consistently delivers more balanced returns between these two extremes. These returns also highlight that the U.S. dollar does not always move uniformly across global currencies. For example, during 2008–2013, a 100-percent hedged approach was never the strongest

Figure 6: Developed Europe Volatility as a Function of Fraction Hedge, 1985–2015



Source: FTSE, as of April 30, 2015. Volatility is measured using standard deviation, which measures how widely dispersed a fund's returns have been over a specified period of time. A high standard deviation indicates that the range is wide, implying greater potential for volatility. Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

Table 1: Calendar Year Returns for Unhedged, 50% Hedged and 100% Hedged

Index	Annual									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
FTSE Developed ex North America (NA)	13.85	27.64	12.85	-43.18	34.03	9.11	-12.05	18.55	21.98	-4.61
FTSE Developed ex NA 50% Hedged to USD	21.63	24.02	9.86	-41.32	31.10	8.34	-11.83	18.35	23.81	0.43
FTSE Developed ex NA 100% Hedged to USD	29.81	20.31	6.90	-39.61	27.97	7.32	-11.78	18.06	25.59	5.64
FTSE Developed Europe	10.05	34.92	14.88	-45.93	37.34	4.40	-11.16	20.21	26.22	-5.65
FTSE Developed Europe 50% Hedged to USD	17.69	28.51	11.38	-42.04	33.92	6.85	-9.98	19.03	24.47	-0.27
FTSE Developed Europe 100% Hedged to USD	25.70	22.21	7.91	-38.23	30.24	8.95	-9.04	17.65	22.62	5.32
FTSE Japan	24.96	5.61	-4.77	-28.58	5.81	15.40	-13.55	8.08	27.32	-3.29
FTSE Japan 50% Hedged to USD	36.07	8.68	-5.73	-35.84	7.41	7.31	-15.65	13.86	39.78	3.11
FTSE Japan 100% Hedged to USD	47.96	11.72	-6.79	-42.65	8.51	-0.48	-17.76	19.69	53.16	9.72

■ Best performance ■ Worst performance

Source: FTSE, as of April 30, 2015. Past performance is no guarantee of future results. Index performance is not intended to predict or project any specific investment. It is not possible to invest directly in an index.

Table 2: Advantages of Implementing 50% Currency Hedging with One ETF

	Single 50% Currency-Hedged ETF	Equally Splitting Assets between a Fully Hedged ETF and a Fully Unhedged ETF
Initial transaction costs	Required for one ETF	Doubled
Annual trading costs	Lower	Higher due to ongoing reallocations
Rebalancing tax implications	Automatic rebalancing within a single portfolio	Potentially higher due to ongoing need to sell shares of one ETF to buy shares of the other
Statements	Streamlined single line item	Multiple line items
Efficient allocation across hedging strategies	Professionally managed, automatically ongoing, and completely transparent	Potentially inefficient due to limited investor research resources Potential to make a wrong call if not allocated properly at any given time

performer in the same year for both European and Japanese equity markets.

ETFs Offer Efficient Implementation

ETF innovation makes it easy to access a 50-percent currency-hedged international equity strategy that fits comfortably into any size portfolio through a single product offering. While replicating a 50/50 approach can be achieved by equally investing in two ETFs, one fully hedged and one fully unhedged, but this presents several unnecessary challenges such as higher investment costs and greater administrative complexity. Table 2 highlights some of these drawbacks and why a single-ETF strategy may make more sense. Plus, investors still benefit from the liquidity, transparency, low cost, and tax efficiency of ETF investing.

A Timely Positioning Move?

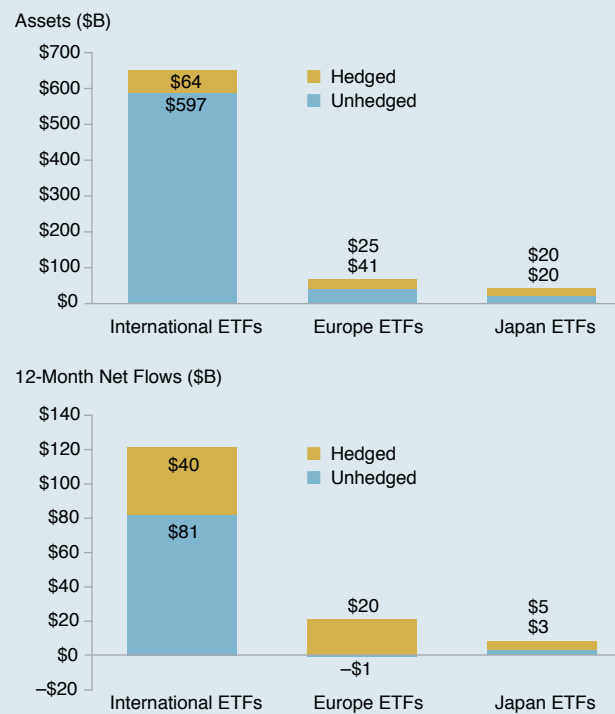
We believe a neutral 50-percent currency hedge makes particular sense in today's uncertain markets because it removes the need to take an active currency view. Figure 7 shows that the bulk of international equity ETF assets and 12-month net flows is in fully unhedged currency strategies. Consequently, the vast majority of investors are making a clear currency call for a weaker U.S. dollar, whether they know it or not. Moreover, most of the 12-month net flow increases into currency-hedged ETFs occurred after the recent large U.S. dollar gains, which indicates that many of these investors might have been chasing returns and may not have fully benefited from the hedge when it was most needed to protect foreign-based equity returns; their portfolios also now may be more vulnerable to any U.S. dollar declines. Now may be an opportune time to reallocate away from both of these types of currency hedging extremes into a more balanced approach.

Conclusion

In the absence of strong convictions around the direction of the U.S. dollar, euro, yen, and other global currencies, investors interested in international equities may find the most practical way to address exchange-rate risk is through a balanced, fixed 50-percent currency hedge. As discussed in this article, a consistent application of this disciplined approach has demonstrated clear advantages in reducing risk exposure. It also provided steadier performance, compared to fully hedged or unhedged indexes (table 1), which, by their very nature, were shown to underperform and outperform on a relative basis as market conditions continuously evolved. Finally, accessing this strategy through a rules-based ETF portfolio can be a less costly and more efficient manner than dual-hedged and non-hedged approaches. ●

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Figure 7: Assets under Management and 12-Month Net Flows, as of May 2015



Source: Morningstar Direct, May 29, 2015. Includes the following categories: International ETFs represented by Diversified Emerging Markets, Europe Stock, Foreign Stock, Japan Stock, Misc. Regions, and World Stock Morningstar categories. Europe ETFs represented by Europe Stock Morningstar category. Japan ETFs represented by Japan Stock Morningstar category.

Appendix: Theory and Economics Applied in Our Research

Correlations and Currency Risk

The unhedged U.S. dollar (USD) return on an investment in a foreign currency equity market is approximately:

$$r_{USD} \approx r_{JPY} + f_{JPY}$$

In other words, the USD return on, for example, Japanese equities (r_{USD}) is approximately equal to the yen (JPY) return on Japanese equities (r_{JPY}) plus the currency return on JPY (f_{JPY}). Thus, there is a gain in USD if the Japanese market rises and/or the JPY rises. The first effect is obvious. The second is simply because the investor holds JPY to invest in the Japanese equity market. If the JPY is more valuable when the investment is exchanged into USD at the end of the investment period than it was at the beginning of the period, the investor has made money on the movement in the exchange rate.

A simple application of basic statistics illustrates:

$$\sigma_{r_{USD}}^2 \approx \sigma_{r_{JPY}}^2 + \sigma_{f_{JPY}}^2 + 2\rho_{r_{JPY}, f_{JPY}}\sigma_{r_{JPY}}\sigma_{f_{JPY}}$$

In this equation, σ^2 is the variance of the return, σ is the volatility or standard deviation, and ρ is the correlation between the JPY return on Japanese equities and the currency return on JPY.

Result: Risk increases as correlation increases.

Intuition: Mathematically, it is clear that the variance of the USD return increases as the correlation increases because the volatilities are both positive. The logic is that as the equity market and the currency move increasingly together (i.e., they are increasingly likely to move in the same direction), this increases the magnitudes of the movements in the USD returns because these moves are reinforcing each other.

For the Developed Europe Index, we observe in the data that the correlation has risen (in fact gone from negative to positive) since the beginning of the financial crisis in Europe. One of the primary economic reasons that account for this shift is the flight to safety. When the crisis struck, and thereafter when there was significant bad news (e.g., the European sovereign debt crisis), investors liquidated riskier positions and demanded safe haven assets. The premier safe haven assets are U.S. Treasury securities. This demand for U.S. Treasuries is also a demand for USD (the currency). Thus, the USD rose and foreign currencies fell in value. This fall in foreign currencies coincided with the fall in the associated equity markets driven both by the original bad news and by the subsequent flight out of these risky assets. This effect generates a positive correlation between equity market and foreign currency returns. Reversals of this phenomenon produce the same positive correlation, when both equities and currencies move back in the opposite direction.

In Japan, however, we observe that the correlation is negative. This has been driven by the unconventional monetary policy by Japan's central bank (nicknamed "Abenomics"). Quantitative easing (QE) and related policies are designed to force down interest rates. These policies have multiple effects, but two are of primary interest for our findings. First, by reducing interest rates, they make bonds less attractive to foreign investors, reduce demand for the currency, and make the currency weaker. Second, local investors (and to some extent foreign investors) substitute from low-interest bonds to other assets such as equities. This pushes equity markets higher, which generates a negative correlation. Again, reversals of this phenomenon produce the same negative correlation when both equities and currencies move back in the opposite direction.

What are the implications going forward? Monetary policy is difficult to predict. In the short run, one might expect Japan and the eurozone to continue loose monetary policy, but the United Kingdom already is implementing a less-aggressive stance. Eventually, world markets should return to a more normal regime where investors might expect to see a return to the negative correlations of earlier times. However, there has already been extreme volatility in eurozone debt markets, and the correlations have switched back to negative when estimated using daily data in the recent past.

Hedging and Risk

The currency-hedged USD return on an investment in a foreign currency, such as JPY again, equity market is approximately:

$$r_{USD} \approx r_{JPY} - \text{cost}$$

The USD return is simply the JPY return minus the cost to hedge away the exchange-rate return. This cost is approximately the risk-free interest-rate differential between the two currencies. If (annualized) risk-free interest rates are 1-percent lower in USD than in JPY, then it will cost about 1 percent per year to hedge the JPY. If USD rates are higher than JPY rates, then the cost will be negative and the currency hedging will generate revenue. The variance of the hedged USD return is approximately:

$$\sigma_{H, r_{USD}}^2 \approx \sigma_{r_{JPY}}^2$$

This equals the variance of the JPY equity return. The intuition is that the cost term varies very little over time relative to either currency or equity returns. Its variance is more than 100 times smaller; therefore we can safely ignore it for developed markets where interest-rate differentials are small and vary very little over time.

Result: Hedging reduces risk.

Intuition: From the equations for the variance of the hedged and unhedged returns, it is clear that the hedged variance is smaller as long as:

$$\sigma_{f_{JPY}}^2 > -2\rho_{r_{JPY}, f_{JPY}} \sigma_{r_{JPY}} \sigma_{f_{JPY}} \rightarrow \rho_{r_{JPY}, f_{JPY}} > -\frac{\sigma_{f_{JPY}}}{2\sigma_{r_{JPY}}}$$

Hedging always reduces risk if the correlation is zero or positive. Even if the correlation is negative, it would have to be less than approximately -0.25 (assuming currency volatility is half equity volatility) in order for the unhedged strategy to be lower risk. Basically, unless the currency return moves strongly in the opposite direction of the local currency equity return, adding currency risk increases overall risk.

Hedging and Returns

Result: Hedging has a minimal long-term effect on average returns.

Intuition: From the equations above, it is clear that the hedged and unhedged return will be equal, on average, if the average hedging cost equals the average return on the foreign currency. This is exactly the condition referred to as uncovered interest-rate parity (UIP). While UIP does not hold in the short term, there is increasing evidence that it does hold in the intermediate to long term. Thus, hedging does *not* sacrifice returns. The economic intuition is that both currency returns and interest-rate differentials are driven, in the longer term, by inflation-rate differentials across the two currencies. High-inflation currencies both depreciate (referred to as purchasing power parity or PPP) and have higher interest rates (this is an implication of the Fisher effect).

Partial Hedging and Risk

When hedging a fraction ω of the currency risk (for example 50 percent), the return is approximately:

$$r_{USD} \approx r_{JPY} + (1 - \omega)f_{JPY} + \omega(\text{cost})$$

The variance of the return is approximately:

$$\sigma_{r_{USD}}^2 \approx \sigma_{f_{JPY}}^2 + (1 - w)^2 \sigma_{f_{JPY}}^2 + 2(1 - w) \rho_{r_{JPY}, f_{JPY}} \sigma_{r_{JPY}} \sigma_{f_{JPY}}$$

Result: There is substantial hedging-associated risk reduction from only partial hedging.

Intuition: Note that in the variance equation the hedging weight appears as a squared term multiplying the currency return variance. Therefore, for example, for 50-percent hedging the coefficient on the currency variance is only $0.5^2 = 0.25$. In essence, this eliminates 75 percent of the currency risk with a 50-percent hedge.

Result: In terms of risk reduction, there is an optimal hedge ratio that depends on the correlation and the relative volatilities of the local currency equity return and the currency return.

Intuition: It is simple to show (taking a derivative) that the amount of hedging that results in the lowest volatility is approximately:

$$w = \frac{\rho_{r_{JPY}, f_{JPY}} \sigma_{r_{JPY}} + \sigma_{f_{JPY}}}{\sigma_{f_{JPY}}}$$

If the correlation is zero, then 100-percent hedging provides minimum risk. As the correlation turns negative, the optimal fraction to hedge is below 100 percent. If local currency equity returns are twice as volatile as currency returns and the correlation is -0.25 , then 50-percent hedging is optimal.

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