Understanding Currency Overlay

July 2010

PREPARED BY
Gregory J. Leonberger, FSA
Director of Research

Abstract

As portfolios have expanded to include international investments, investors must be aware of the currency risk inherent in foreign assets. Currency overlay programs provide a mechanism to mitigate currency risk. This paper examines how currency overlay programs can be used to reduce the currency risk embedded in foreign denominated portfolio allocations.

PREPARED BY MARQUETTE ASSOCIATES

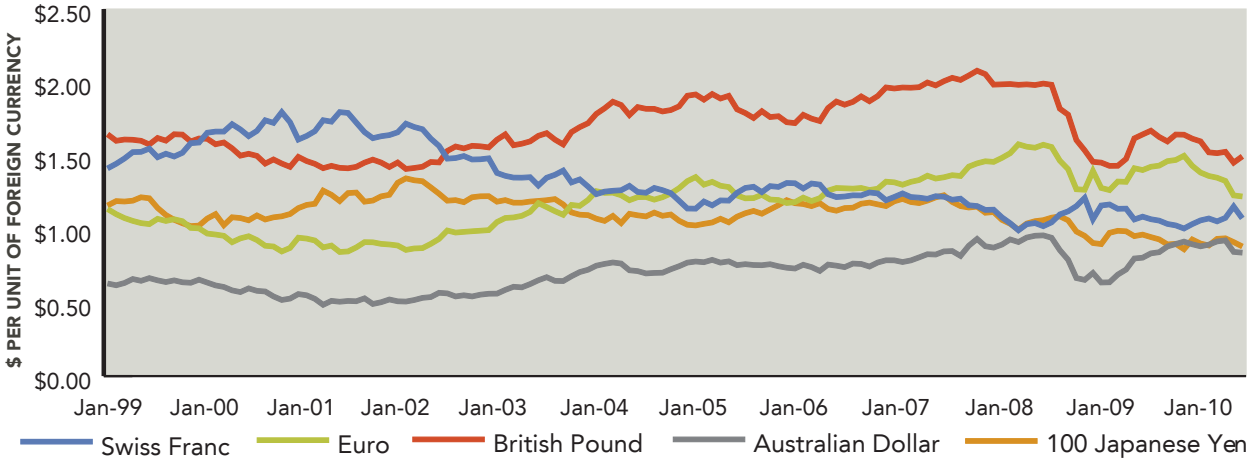
180 North LaSalle St, Ste 3500, Chicago, Illinois 60601 PHONE 312-527-5500 WEB marquetteassociates.com

MarquetteAssociates

Currency overlay programs are dedicated to the management of *existing* currency risk in a portfolio; currency exposures are treated as a separate decision from the overall asset allocation. The objective of currency overlay programs is to limit losses and maximize gains that arise from currency risk. In the following, we examine currency overlay programs and how they can manage currency risk. We also investigate the primary risks of each strategy, along with the types of clients that implement an overlay. Before discussing overlay strategies, we cover why an overlay program could be beneficial to investors.

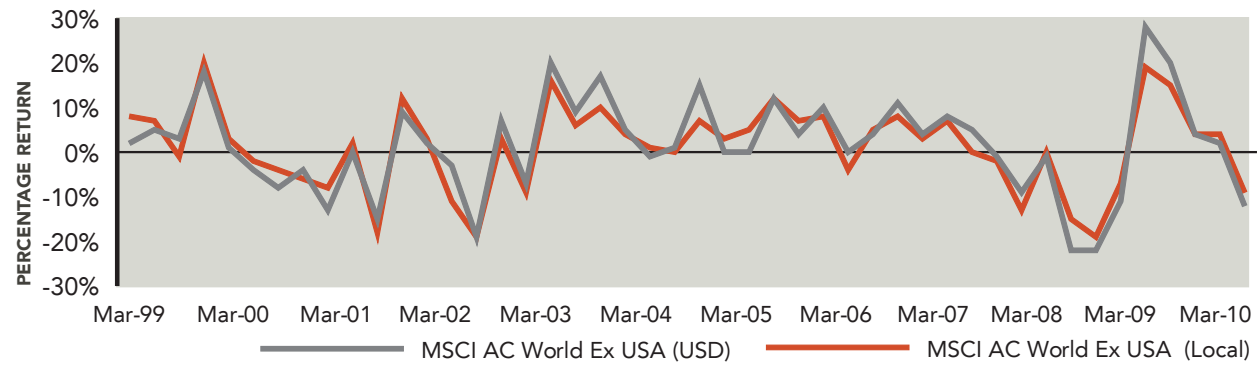
As financial markets have become integrated across the globe, most investors have expanded their portfolios to include foreign assets. While the benefits of such diversification are well known, it is important to understand the risks inherent in holding international investments. In particular, movements in exchange rates tend to be volatile and unpredictable, which creates currency risk. Below, Figure 1 charts the fluctuations in exchange rates between the U.S. dollar and five foreign currencies between 1999 and 2010. As the graph demonstrates, movements in exchange rates are large and rapid.

Figure 1: Select Foreign Exchange Rates, 1999 - June 2010



Given the volatility of exchange rates, it is not surprising that investments in international equities are volatile. Below, we chart the performance of a common international stock index, the All Country World Index excluding the United States (referred to as "ACWI ex-U.S."). The chart shows performance in terms of the base currency (U.S. dollars), as well as the composite local currency (i.e. the weighted average currency of all the countries represented in the index). Over the course of 10 years, we see great variation in returns, including different movements between two currency measures; though currency risk does not explain all of the volatility, its impact on international investments should not be underestimated.

Figure 2: International Stock Index Returns, 1999 - June 2010



As an additional exhibit (please see the Appendix for more detail), we develop examples to illustrate how currency risk can adversely affect a portfolio that holds foreign denominated stock. Consider a U.S. dollar denominated portfolio that allocates a portion of its holdings to European stock (thus this share of the portfolio is priced in euros). Now in addition to following the performance of the euro denominated stock, an investor must also track the exchange rate between the two currencies. If the exchange rate does not change, then the performance does not change when converting between the two currencies: a 10% loss in euros is a 10% loss in dollars. However, if the exchange rate moves, the performance of the portfolio can be enhanced (if the dollar weakens versus the euro) or reduced (if the dollar strengthens versus the euro). The Appendix contains concise examples of each of these scenarios, thus further showing the impact of exchange rate movement on portfolio return.

Given the above examples, there is no question that investments in foreign denominated currency add an additional element of risk to portfolios. Fortunately, currency overlay programs can mitigate these risks; some even create profit opportunities. To be clear, we stress that the overlay programs described below are dedicated to the management of *existing* currency risk in a portfolio. For example, a client may dedicate 20% of its portfolio to international equities; the decision of how to mitigate the currency risk is independent of the decision to allocate a portion of the portfolio to foreign denominated equities. It is also important to understand that a currency overlay program is not a direct investment; rather it is a risk management program implemented with derivatives that do not require an asset allocation. Aside from a small deposit to cover operating expenses, assets are not moved out of a plan's current asset allocation. We now turn to a discussion of the most common currency overlay programs.

Currency overlay can be passive or active. A passive overlay is relatively straight forward: a complete hedge of the currency exposure is installed and effectively converts the total foreign currency exposure back into the base currency. The focus of such a strategy is strictly to eliminate risk; no part of this approach seeks to add additional return to the portfolio. By smoothing out the peaks and valleys in asset values due to currency fluctuations, a passive currency hedge eliminates all risk from exposure to foreign currency and provides increased stability to asset values.

A passive currency overlay is executed using elementary derivatives, most notably futures, forwards, and swaps. A manager looking to fully hedge his exposure back into the base currency will purchase one or more of these instruments, which will lock in an exchange rate between the base and foreign currencies. Although the actual exchange rate will continue to fluctuate, the manager has locked in the exchange rate over the life of the contract. At contract expiration, the manager will enter into another contract that locks the exchange rate (though the new exchange rate that is hedged will probably be different to reflect movement in the underlying currency since inception of the initial contract); the process continues as long as a hedged position is desired.

The benefits of passive currency management derive from the overall simplicity of the strategy. Most important – and obvious – a portfolio is protected from any adverse movements in foreign currency, which could allow the investor to assume additional risk in other asset classes. Another benefit is that fees tend to be low, as the strategy is passive and relies upon standardized derivative contracts.

However, the simplicity of a passive strategy also drives some of its disadvantages. Although removing currency risk can reduce overall portfolio risk, it eliminates the diversification benefits of having a portion of the portfolio denominated in foreign currency. In addition, it is impossible to participate in favorable currency returns when all international holdings are hedged relative to the base currency.

Although passive overlay programs are appropriate for some clients, they are fairly simplistic in intent and structure. Active overlay programs attempt to reduce losses from foreign currency exposure, but introduce an active management component seeking to add a source of excess return (commonly referred to as "alpha") by allowing for active management of the unhedged portion of the portfolio's international exposure.

For a typical currency overlay implementation, an initial hedge ratio is established. This percentage is the fraction of the portfolio that will be completely hedged against currency movements. The initial hedge ratio is determined on a portfolio specific basis, taking into account factors such as a client's assets, liabilities, and liquidity needs. The portion of the portfolio that is not hedged (i.e. the percentage equal to one minus the hedge ratio) is then actively managed to generate alpha by exploiting currency movements.

The hedge ratio can be fixed or vary dynamically depending on underlying currency movements. Fixed hedge ratios are examined periodically (typically every couple of years) to insure the hedged ratio remains compliant with the plan's overall objectives. For portfolios with dynamic hedge ratios, a set of parameters are developed to allow deviation from the initial hedge ratio to provide the active manager latitude to exploit currency movements and generate alpha. For example, consider a U.S. dollar based investor with a 20% exposure to the British pound. Initially, the hedge ratio is set at 50%. If the currency manager expects the dollar to appreciate versus the pound, he will increase the hedge ratio, potentially all the way to 100%. Conversely, if the manager expects the dollar to depreciate against the pound, he will reduce the hedge ratio down to 0% if convictions are especially strong. Both of these decisions – scaling the hedge ratio up or down – capture return during times of U.S. Dollar appreciation and depreciation, while reducing the risk inherent in currency volatility. The more freedom a manager has to drift from the hedge ratio, the greater the potential for additional returns.

Of course, the decisions of when to move in and out of currency positions are not arbitrary. Rather, managers primarily rely on quantitative models to reveal profitable trading opportunities. These proprietary models focus on such factors as:

- Market trends (momentum) – differentiating between directional and random movements in exchange rates can provide profit opportunities.

- Interest rate differential – high interest rate currencies reflect a risk premium, and may attract short term cash flows.

- Macroeconomic factors – metrics such as inflation, GDP, unemployment, and growth can identify emerging trends in a country which could translate to currency appreciation or depreciation.

- State probability – estimate of probability that currency is in its strong or weak state.

Typically, these models are calibrated using historical data and frequently reviewed to confirm or adjust predictive power. As new trends emerge, factors may be added or subtracted to reflect the fluid global economy.

While managers lean heavily on quantitative models to identify profitable currency trades, some managers allow a modest role for qualitative analysis. Although less important than the quantitative model driven process, some currency characteristics – such as political events, market liquidity, and short term market positioning – are better captured by expert professional judgment. These qualitative judgments can be an important complement to the rigorous quantitative models. Collectively, the two approaches help identify inefficiencies in the currency markets.

Although currency markets are the largest ($3.2 trillion traded per day) and most liquid exchanges in the world, they are not perfectly efficient. The inefficiency arises because a substantial number of participants are not looking to make profits. Included in this group are:

- Central banks whose main goals are to control domestic inflation and the relative value of the domestic currency.

- Passive equity and fixed income managers who must buy and sell foreign currency whenever the components of an index change.

- Corporate treasurers who are seeking to hedge profits or receivables and have no choice as to when to participate in foreign currency markets.

- Tourists who need to exchange money for foreign travel.

Consequently, profitable trading opportunities exist, and currency overlay programs seek to identify and profit from these inefficiencies.

The most common financial instruments used to execute the active management of currency risk are the same as those used for passive management. In particular, forwards and futures are heavily utilized. Forwards tend to be particularly useful as they can be customized, and do not require daily settlement or initial collateral, therefore lessening the liquidity demands. If a manager sees a favorable exchange rate emerge, he will enter into a forward contract to lock in a mismatch of exchange rates and generate the profit.

An active currency overlay program extends the features of a passive hedge to profit from currency movements by actively managing the unhedged portion of the portfolio's international exposure. As such, the active component adds several benefits to those discussed for the passive approach. First, the correlation between excess returns to currencies and underlying assets is typically low, so active currency management can reduce portfolio volatility and reduce the probability of extreme return outcomes – positive or negative. Second, transaction costs tend to be low because most strategies utilize standardized derivative products to execute trades. Third, capital requirements are limited, as most contracts require little collateral.

Despite these benefits, investors must understand the inherent risks in active currency overlay programs. Most importantly, there are no guarantees that managers will correctly identify profitable trends. If a manager is on the wrong side of a trade, the loss can be exacerbated or the return reduced: managers are not always correct. Fees, although not high, are higher than a passive overlay as there is an active component of asset management. While the benefits do seem to outweigh the incremental risks, investors should weigh both the positives and negatives of an active currency overlay program.

As mentioned earlier, a currency overlay program usually does not require the investment of additional assets; only a modest cash deposit is needed to cover operating expenses. In some cases, a small amount of cash reserves is also required to fund potential losses from the program, but these reserves can be equitized to eliminate the cash drag on the underlying portfolio. Typically, a plan will implement a currency overlay strategy with a dedicated manager using a separate account. Separate accounts are attractive because the client can work with the manager to establish customized constraints to suit the plan's underlying asset position.

Fees tend to vary: passive overlay programs can be as low as 20 basis points of total assets, while more active overlay programs will charge a higher management fee, and some may include a 20% performance incentive if the program beats a pre-established benchmark (not unlike the hurdle rate for private equity and hedge funds).

Currency overlay programs are employed by a variety of institutional investors including pension plans, endowments, foundations, and insurance companies. Most have an allocation of at least 15% to international investments and are seeking a source of protection or increased return, depending on the choice of passive or active overlay program. While different managers have varying required minimum exposure amounts, there is not a universal minimum dollar requirement. In some cases, clients who do not have any international exposure will still implement a currency overlay program as a way of gaining some international exposure. Given the variety of currency overlay programs available, most investors can find a strategy that suits their objectives.

Currency overlay programs can make sense for investors who are concerned about the currency risk embedded in international investments. Passive and active programs are available to meet the objectives and risk tolerance of each individual plan. Before pursuing an overlay program, investors should carefully review their overall asset allocation, future liquidity needs, and investment policy guidelines to assess if an overlay program is appropriate.

Appendix

Base Case:

	Dollar	Euro
Exchange rate	$1.50	€1.00
Portfolio value	$1,500,000.00	€1,000,000.00
Portfolio return	0%	0%

For our examples, we start with a portfolio that has been purchased with dollars, and is now denominated in euros. We will examine how the portfolio performs on a dollar basis as the exchange rate fluctuates. Ultimately, these examples confirm the risk of exchange rate movements, and how changes in exchange rates can have a significant impact on portfolio returns.

As a starting point, the dollar amount of $1.50 equals €1.00 since the exchange rate is 1.5 to 1. To simplify, portfolio values have been matched with respective exchange rates.

Scenario 1: Portfolio declines 10% in euros

	Dollar	Euro
Exchange rate	$1.50	€1.00
Portfolio value	$1,350,000.00	€900,000.00
Portfolio return	-10%	-10%

In scenario 1, the exchange rate stays the same at $1.50 to €1.00. The euro portfolio loses 10% of its value and ends up at €900,000 (€100,000 loss), thus translating to a 10% decrease in the U.S. portfolio with its amount ending up at $1,350,000 ($150,000 loss).

The calculations for the euro are as follows: €1,000,000 * 10% = €100,000. €1,000,000 - €100,000 = €900,000.

The calculations for the dollar are as follows: $1,500,000 * 10% = $150,000. $1,500,000 - $150,000 = $1,350,000.

$1,350,000/€900,000 = 1.5 (which is the exchange rate).

Scenario 2: Portfolio appreciates 10% in euros

	Dollar	Euro
Exchange rate	$1.50	€1.00
Portfolio value	$1,650,000.00	€1,100,000.00
Portfolio return	10%	10%

In scenario 2, the exchange rate stays the same at $1.50 to €1.00. The euro portfolio gains 10% of its value and ends up at €1,100,000 (€100,000 gain), thus translating to a 10% increase in the U.S. portfolio with its amount ending up at $1,650,000 ($150,000 gain).

The calculations for the euro are as follows: €1,000,000 * 10% = €100,000. €1,000,000 + €100,000 = €1,100,000.

The calculations for the dollar are as follows: $1,500,000 * 10% = $150,000. $1,500,000 + $150,000 = $1,650,000.

$1,650,000/€1,100,000 = 1.5 (which is the exchange rate).

Scenario 3: Portfolio declines 10% in euros, dollar appreciates

	Dollar	Euro
Exchange rate	$1.00	€1.00
Portfolio value	$900,000.00	€900,000.00
Portfolio return	-40%	-10%

In scenario 3, the dollar appreciates (strengthens) against the Euro ($1.00 to €1.00). The euro portfolio loses 10% of its value and ends up at €900,000 (€100,000 loss), thus translating to a 40% loss in the US portfolio with its amount ending up at $900,000 ($600,000 loss).

The calculations for the Euro are as follows: €1,000,000 * 10% = €100,000. €1,000,000 - €100,000 = €900,000.

Using the new exchange rate (because the dollar has now strengthened relative to the euro), we convert €900,000 to dollars: €900,000 * $1 / €1 = $900,000.

The calculation for the 40% loss in the US portfolio is as follows: ($900,000 - $1,500,000) / $1,500,000 = -40%.

$900,000/€900,000 = 1.0 (which is the exchange rate).

Scenario 4: Portfolio appreciates 10% in euros, dollar appreciates

	Dollar	Euro
Exchange rate	$1.00	€1.00
Portfolio value	$1,100,000.00	€1,100,000.00
Portfolio return	-27%	10%

In scenario 4, the dollar appreciates (strengthens) against the euro ($1.00 to €1.00). The euro portfolio gains 10% of its value and ends up at €1,100,000 (€100,000 gain), thus translating to a 27% loss in the U.S. portfolio with its amount ending up at $1,000,000 ($400,000 loss).

The calculations for the euro are as follows: €1,000,000 * 10% = €100,000. €1,000,000 + €100,000 = €1,100,000.

Using the new exchange rate (because the dollar has now strengthened relative to the euro), we convert €1,100,000 to dollars: €1,100,000 * $1 / €1 = $1,100,000.

The calculation for the 27% loss in the U.S. portfolio is as follows: ($1,100,000 - $1,500,000) / $1,500,000 = -27%.

$1,100,000/€1,100,000 = 1.0 (which is the exchange rate).

Scenario 5: Portfolio declines 10% in euros, dollar depreciates

	Dollar	Euro
Exchange rate	$2.00	€1.00
Portfolio value	$1,800,000.00	€900,000.00
Portfolio return	20%	-10%

In scenario 5, the dollar depreciates (weakens) against the euro ($2.00 to €1.00). The euro portfolio loses 10% of its value and ends up at €900,000 (€100,000 loss), thus translating to a 20% gain in the U.S. portfolio with its amount ending up at $1,800,000 ($300,000 gain).

The calculations for the euro are as follows: €1,000,000 * 10% = €100,000. €1,000,000 - €100,000 = €900,000.

Using the new exchange rate (because the dollar has now weakened relative to the euro), we convert €900,000 to dollars: €900,000 * $2 / €1 = $1,800,000.

The calculation for the 20% gain in the U.S. portfolio is as follows: ($1,800,000 - $1,500,000) / $1,500,000 = 20%.

$1,800,000/€900,000 = 2.0 (which is the exchange rate).

Scenario 6: Portfolio appreciates 10% in euros, dollar depreciates

	Dollar	Euro
Exchange rate	$2.00	€1.00
Portfolio value	$2,200,000.00	€1,100,000.00
Portfolio return	47%	10%

In scenario 6, the dollar depreciates (weakens) against the euro ($2.00 to €1.00). The euro portfolio gains 10% of its value and ends up at €1,100,000 (€100,000 gain), thus translating to a 47% gain in the U.S. portfolio with its amount ending up at $2,200,000 ($700,000 gain).

The calculations for the Euro are as follows: €1,000,000 * 10% = €100,000.
€1,000,000 + €100,000 = €1,100,000.

Using the new exchange rate (because the dollar has now weakened relative to the euro), we convert €1,100,000 to dollars: €1,100,000 * $2 / €1 = $2,200,000.

The calculation for the 47% gain in the U.S. portfolio is as follows:
($2,200,000 - $1,500,000) / $1,500,000 = 47%.

$2,200,000/€1,100,000 = 2.0 (which is the exchange rate).

PREPARED BY MARQUETTE ASSOCIATES

180 North LaSalle St, Ste 3500, Chicago, Illinois 60601 PHONE 312-527-5500 WEB marquetteassociates.com

About Marquette Associates

Marquette Associates is an independent investment consulting firm that helps institutions guide investment programs with a focused three-point approach and carefully researched advice. For 25 years Marquette has served this mission in close collaboration with clients – enabling institutions to be more effective investment stewards. Marquette is a completely independent and 100% employee-owned consultancy founded with the sole purpose of advising institutions. For more information, please visit www.marquetteassociates.com.