

# Using Currency Futures to Hedge Currency Risk

By Sayee Srinivasan & Steven Youngren  
Product Research & Development  
Chicago Mercantile Exchange Inc.

## Introduction

Investment professionals face a tough climate. Fixed income yields are at near lows. U.S. equity markets have been depressed for the past three years. Given the recent geopolitical uncertainties, the foreign currency markets have been in turmoil. What little returns that can be achieved by investment managers need protection. The investing public more and more is reaching out to global markets to make money and the issue of protecting investment returns from foreign exchange risk becomes critical.

## Explaining Currency Risk

A key difference between investing in domestic and foreign assets is that the latter exposes the investor to a currency risk. Over the years, most investors have not been careful in characterizing this risk to returns from unhedged portfolios. One simplistic view was to measure the return in domestic currency terms and compare it with returns in local currency terms, and characterize the difference as the “currency effect.” The reasoning was that if the exchange rate remains constant from the time of purchase of the foreign asset to its sale, then the currency risk has had zero impact. On the other hand, if the domestic currency has weakened (strengthened) against the foreign currency, the exposure would result in a gain (loss).

In August 1998, the Association for Investment Management Research (AIMR) argued that the use of changes in spot exchange rates (over the investment period) as a measure of the influence of currency risk on foreign asset returns was misleading. AIMR preferred an alternate approach, one that involved splitting the currency effect into components: expected or *known* effect captured by forward premium or discount; and unexpected or *surprise* effect as defined below.

Let's assume that we are measuring foreign asset returns for a U.S. investor. Expressing exchange rates in terms of US\$ per unit of foreign currency, currency surprise in period  $t$  is defined<sup>1</sup> as

$$\text{Currency surprise}_t = \left[ \frac{(\text{Foreign currency spot rate}_t) - (\text{Foreign currency forward rate}_{t-1})}{\text{Foreign currency spot rate}_{t-1}} \right]$$

In other words, currency surprise can be interpreted as “the unexpected movement of the foreign currency relative to its forward rate or market predicted rate.”<sup>2</sup> The assumption here is that the forward premium or discount (expected currency effect) will be embedded in the return from a fully hedged portfolio. This implies that

*Unhedged foreign asset return (US\$) = Currency surprise + Hedged foreign asset return (US\$)*

Currency surprise is essentially noise. So every investor in foreign assets must make an explicit decision on whether or not he wants to take on exposure to this noise factor.

### **To Hedge or Not to Hedge?**

Over the years, there has been considerable controversy on this question. As might be expected, there are multiple view points regarding the relative merits of hedging away currency risks. Here are a couple of classic arguments in favor of not hedging.

#### *Uncorrelated risks*

On a historical basis, changes in exchange rates (and hence currency returns) have had very low correlations with foreign equity and bond returns. The belief is that this lack of any systematic relationship could in theory lower portfolio risk.

#### *Expected returns are zero*

Viewed over a long investment horizon, currency movements cancel out each other – the mean-reversion argument. In other words, exchange rates have an expected return of zero. So why bother hedging against currency surprise.

The arguments in favor of hedging are as follows:

#### *How long is the long-run?*

Financial planners advise their clients to pursue buy-and-hold strategies. If one trades with the attitude of “investing for the long-run”, ignoring short-term dynamics of currency returns could be a perfectly valid strategy. Folks who invest other peoples’ money, fund managers, though tend to be compensated on their quarterly performances relative to benchmark indices. In addition, there is sufficient evidence on the high turnover rates of actively managed fund portfolios. In such instances, it behooves the fund manager to take into account the impact of currency movements on the risk-return characteristics of his or her portfolio.

### *Realized versus expected returns*

Currency returns tend to be episodic. In other words, there can be sufficient movement in exchange rates in the short run that in theory could be exploited to generate positive returns. More important, these movements also tend to exhibit<sup>3</sup> some degree of persistence.

### *Risk-return trade-off*

A study by Bob Doyen compares risk and return from hedged and unhedged equity portfolios. It specifically looks at the MSCI EAFE Index for the period January 1980 to June 1999. (Morgan Stanley Capital International Europe, Australia, Far East Index is the most commonly cited international equity index.)

<i>Jan 1980 to Jun 1999</i>	<i>Annualized return</i>	<i>Volatility</i>
Unhedged EAFE return in US\$	13.48%	17.52%
Hedged (US\$) EAFE return	13.51%	15.29%

It vividly illustrates the zero impact of currency movements on asset returns over the long run. But it also presents sufficient evidence that hedging reduces the volatility of the return. From an efficient portfolio perspective, hedging does seem to be an attractive strategy.

To conclude, whether foreign assets are being held for the short- or the long-run, it is apparent that hedging can help improve a fund manager's performance and thus deliver value to investors.

### **Instruments for Hedging Currency Risk**

Foreign currency markets are deep, highly liquid, and relatively inexpensive. Fund managers seeking to manage their currency exposures can pursue one or more strategies: trade over-the-counter (OTC) market currency forwards and options, exchange-traded futures and options on futures, or hire the services of an overlay manager. Overlay managers are essentially specialist currency trading firms that will actively manage a currency hedge mandate, and in addition, attempt to generate a positive excess return. These firms too rely on currency futures, forwards and options contracts.

### **Exchange-Traded Currency Futures**

Exchange-traded currency products offer at least three major advantages vis-à-vis the inter-bank over-the-counter (OTC) market: (1) price transparency and efficiency, (2) elimination of counterparty credit risk, and (3) accessibility for all types of market participants.

### *Price Transparency and Efficiency*

Futures and options exchanges bring together in one place divergent categories of buyers and sellers to determine foreign exchange prices. This efficient price discovery process is further enhanced by transparent trading arrangements. Whether the trading venue is open outcry or electronic, the prices for exchange-traded foreign currency products are disseminated worldwide via major quote vendors such as Reuters, Bloomberg, and others. Electronic trading on computerized trading systems (e.g., GLOBEX<sup>®</sup> at Chicago Mercantile Exchange (CME) Inc.) takes place on a nearly 24-hour basis.

### *Elimination of Counterparty Credit Risk*

Exchange-traded currency contracts have the exchange clearing house as the counterparty to every trade. For example, the CME Clearing House is the buyer to every seller and the seller to every buyer of all its currency products. Market participants then need not evaluate the credit worthiness of multiple counterparties. The CME Clearing House is their counterparty. All clearing members of the CME Clearing House stand behind trades at the exchange. Importantly, there has never been a single default in the 104-year history of the exchange. The OTC inter-bank market operates on the basis of credit limits for every potential counterparty. BIS requires banks to maintain adequate levels of capital to cover forward-maturity currency transaction risk. These requirements are waived for foreign exchange transactions booked on exchanges, where performance bonds are required and daily mark to market of open positions is done.

### *Accessible to All Market Participants*

The advent of financial futures began in the early 1970's because some inventive and persistent commodity traders at Chicago Mercantile Exchange did not have access to the inter-bank foreign exchange markets when they believed significant moves were about to take place in currency prices. They established the International Monetary Market (now a division of CME), which launched trading in seven currency futures contracts on May 16, 1972—creating the world's first financial futures. No longer was the arena of foreign exchange trading limited to large commercial banks and their big corporate customers. Individuals, small and medium-sized banks and corporations, investment funds and governments can buy and sell currencies for future delivery or cash settlement. Universal access to its markets is an important defining characteristic of exchange-traded foreign currency futures and options.

## **Illustrating the Use of Currency Futures**

### *Example 1: Hedging Mexican Peso Foreign Currency Risk*

A U.S. hedge fund continues to find Mexican Treasury bill (CETES) yields attractive and decides to rollover an investment in CETES, whose principal plus interest at maturity in five months will be 850 million Mexican pesos (MP). Knowing that its all-in return is subject to U.S. dollar versus Mexican peso exchange rate risk, the U.S. hedge fund wanted to hedge its exposure of converting the CETES investment back into U.S. dollars. After assessing the available alternatives, the U.S. hedge fund chose to hedge with exchange-traded Mexican peso futures contracts.

The trading unit of the Mexican peso futures is 500,000 MP. Therefore, on May 1st, the U.S. hedge fund sells 1,700 September 2003 Mexican peso futures at \$0.08950 per MP (equivalent to 850 million MP). Over the course of the next five months the U.S. dollar exchange rate for the Mexican peso falls to \$0.08600 per MP. As the Mexican peso futures price falls, the hedge fund's trading account at its clearing member firm is credited the gains on the position by the exchange clearing house. The price move from US\$0.08950 to US\$0.08600 per Mexican peso on the short Mexican peso futures position represents a gain of US\$0.00350 per Mexican peso. This is equal to a profit of US\$1,750 per contract times 1,700 contracts for a net position gain of US\$2,975,000. (For the purpose of these examples, calculations do not include brokerage or clearing fees that may be associated with exchange transactions.) This U.S. dollar profit when added to the U.S. dollars resulting from conversion of the Mexican peso-denominated CETES principal and interest into U.S. dollars at the lower dollar / peso exchange rate (of US\$0.08600 per Mexican peso), results in an effective rate equivalent to the Mexican peso futures price at the start of the hedge.

### *Example 2: Hedging equity portfolio risk using CME\$INDEX futures contracts*

In recent months, CME has introduced a new dollar index futures contract. The CME\$INDEX is a geometric index of seven foreign currencies, weighted to reflect the relative competitiveness of U.S. goods in foreign markets. It is designed to provide investors with a new instrument for currency market participation and risk management. Here is an example illustrating the use of CME\$INDEX futures to hedge international equity portfolio risk.

During the period January to February of 2003, a large U.S. pension fund invested in various overseas equity markets. Though the fund manager was comfortable with the near-term market risk of these individual countries, given the recent weakness in the US dollar, plus the impending war in Iraq, he sought to reduce portfolio risk by hedging a portion of the currency risk. The foreign investment portfolio was valued at approximately \$100 million, and the manager believed that the U.S. dollar would not remain weak for an extended period of time.

On March 11, 2003, the June CME\$INDEX futures contract traded at 103.45. At this price, the notional value of each contract was \$103,450. Since the fund manager wanted to hedge half of his currency exposure, he bought 483 dollar index contracts, a number which he derived by dividing \$50 million by \$103,450. In purchasing CME\$INDEX futures contracts, the fund manager took on a position that was long the U.S. dollar and short a basket of seven currencies, thereby hedging his exposure to the underlying currency risk.

#### Scenario A

Suppose that during mid-May 2003, the US dollar begins to reverse its course. By early June, the U.S. dollar is up 3.5% on average, and the pension fund has cut back on its exposure to overseas equity markets by 25%. The CME\$INDEX June futures contract is now trading at 107.20 and if he so desires, the fund manager can sell 121 contracts at this price, or 25% of his 483 contract holdings, in order to book a gain of \$453,750 on his currency hedge. In this instance, the unhedged portion of the portfolio would result in a loss due to the strengthening of the U.S. dollar. The remaining 362 CME\$INDEX futures contracts could then be rolled over to the next quarterly contract.

#### Scenario B

Referencing Scenario A above, assume that the U.S. dollar instead remains weak and is down by 2% by early June. The fund manager can take physical delivery on 121 contracts, whereby he would receive US dollars and would pay the appropriate amount of each of the seven currencies in the index. (In a simple scenario, he would be using the foreign currency proceeds from the sale of various stocks to make these payments.) This hedge has simply reduced the potential gain from the US dollar weakness.

### **Conclusion**

During periods of intense market risk, issues related to hedging different risk factors become critical. This paper has focused on currency risks. We started with a complete definition of currency effect on foreign portfolio returns, and argued in favor of protecting against this risk. The main benefit of a full hedge would be in the form of a reduction in portfolio volatility. Fund managers can choose from a range of instruments to hedge their currency risks. The paper argues that exchange-traded futures contracts have certain advantages that

make them suitable for managing single currency as well as multiple currency exposures, providing examples of hedging U.S. dollars versus Mexican pesos and hedging equity portfolio risk using the new CME\$INDEX.

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<sup>1</sup> See "Currency – A New Look at the Zero Sum Game", Neil Record, Institute for Fiduciary Education, conference proceedings, July 2000, available at <http://www.ifecorp.com/Papers-PDFs/Record700.pdf>

<sup>2</sup> See "Currency Management: Have the Merits for Hedging Weakened?" Bob Noyen, Institute for Fiduciary Education, conference proceedings, October 1991, available at <http://www.ifecorp.com/Papers-PDFs/Noyen1099.pdf>.

<sup>3</sup> See "Holding on to the Currency Bonanza" John R. Taylor, Jr., available at <http://www.fx-concepts.com/Papers/bonanza.pdf>.