

# The Performance of Currency-Hedged Foreign Bonds

*The historical performances of hedged versus unhedged foreign bonds show that currency hedging can substantially reduce the volatility of foreign bonds and foreign bond portfolios, while having little effect on their returns. When held hedged, all the foreign government bonds examined (with the exception of Canadian bonds) were less volatile than their U.S.-dollar counterparts. Furthermore, hedging improved the bonds' return/risk ratios.*

*Hedged foreign bonds performed better than unhedged bonds as diversification vehicles for a U.S. fixed income investor. While unhedged foreign diversification offered U.S. investors higher returns than U.S. Treasuries, it was also riskier. Unhedged foreign bond portfolios fluctuated dramatically, sometimes outperforming U.S. Treasury bonds and sometimes doing much worse, depending on how the U.S. dollar performed. The hedged diversified portfolios were consistently less risky than U.S. Treasuries alone and consistently more stable than a portfolio of unhedged foreign bonds.*

INVESTORS WHO HOLD fixed income securities denominated in foreign currencies incur the usual bond risks—primarily credit risk and interest rate risk—plus the risk that the foreign currency in question will depreciate against their base currency. Because of this exchange rate risk, it may seem difficult to take advantage of opportunities in foreign markets. A U.S.-dollar investor, for example, may believe that particular foreign bonds offer unusual value, or may simply wish to reduce exposure to changes in domestic interest rates by diversifying into foreign bonds. Yet he may hesitate to invest abroad if he thinks foreign currencies are likely to depreciate against the U.S. dollar.

Fortunately, portfolio managers need not forgo the opportunities offered by foreign bonds just because of exchange rate risk. They can instead use foreign bonds that have been *synthetically redenominated* into U.S. dollars. A syn-

thetic dollar bond is exposed to changes in foreign interest rates, but it is relatively insensitive to changes in domestic interest rates. Consequently, such a bond offers an attractive diversification outlet plus an opportunity to earn capital gains if foreign interest rates decline. At the same time, the synthetic dollar bond, by design, will have little exchange rate risk.

A synthetic dollar bond can be constructed by combining short-dated forward exchange contracts with longer-dated foreign currency bonds.<sup>1</sup> This technique for reducing or eliminating exchange rate risk is called a **rolling forward hedge**. Briefly, the forward contract creates a foreign currency liability equal in value to the foreign currency asset—the bond. But because its duration is short, the forward obligation does not substantially alter the bond's interest rate exposure.

This article examines the performance of synthetic dollar bonds—foreign bonds hedged with rolling forward contracts. In all cases, the perspective is that of a U.S.-dollar investor holding 10-year government bonds.<sup>2</sup> We show that the arguments for including hedged foreign bonds

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*Lee Thomas is a member of the management committee, responsible for trading and arbitrage, at Arabian Investment Banking Corporation (INVESTCORP) E.C. When this article was written, he was Executive Director, Financial Strategies Group, of Goldman Sachs International Limited.*

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1. Footnotes appear at end of article.

in an investment portfolio are compelling. Hedged foreign bonds have offered dollar investors about the same return, with far less risk, than unhedged foreign bonds.

### Risk and Return

Imagine that a dollar-based investor buys a non-dollar bond at the beginning of the month. She hedges her exchange rate risk by selling the bond's current foreign currency value, plus future coupon payments or accrued interest, for one-month delivery against U.S. dollars. The forward exchange rate for this hedging transaction will reflect the foreign currency's discount or premium. At month-end, she sells the foreign bond and delivers the foreign currency realized from its sale to satisfy her forward exchange contract.

We can divide the total return on this hedged bond transaction into four parts:

- (1) interest income earned, including accrued but unpaid interest;
- (2) the capital gain or loss on the bond;
- (3) the discount or premium on the foreign currency sold forward; and
- (4) the foreign exchange rate change during the month, applied to the capital gain or loss on the bond.

Item (2), the capital gain or loss, will depend on the bond's duration and on the change in foreign interest rates during the month. The sum of the capital gain or loss and Item (1)—interest income earned—will equal the return to the bond measured in its local currency.

Item (3), the discount or premium on the foreign currency, is roughly equal to the one-month interest rate differential (on Eurodeposits) between the U.S. dollar and the currency in which the bond is denominated. If the foreign one-month interest rate is lower than the U.S. dollar rate, then the foreign currency will sell at a forward premium. This increases total return, measured in dollars. If the one-month foreign interest rate exceeds the U.S. rate, then the foreign currency will sell at a discount, reducing dollar return.

Item (4) represents the investment's foreign exchange risk. Because the currency hedge, accomplished by selling foreign exchange forward for dollars, covers only the initial value of the bond and one month's interest income—not the increase or decrease in the bond's market value—the investment is exposed to exchange

**Table I** Sources of Risk in Foreign Bonds, 1975–1988

Country	Local Currency Variation (%)	Exchange Rate Variation (%)	Covariation (%)
Germany	17	58	25
Japan	21	49	25
U.K.	38	39	22
France	17	72	11
Canada	65	18	17
Netherlands	22	68	11
Average	30	51	19

\* Here risk is measured by variance of return rather than the standard deviation of return, as elsewhere in this article. We chose to use variance here to ensure that the sum of the risks contributed by interest rate changes, exchange rate changes and covariation equaled 100 per cent of the total variation. All bonds in the analysis are approximately 10-year maturities.

rate changes on the capital gain or loss. But this element will ordinarily be small compared with the other three.<sup>3</sup> We can safely neglect it in the discussion that follows.

The total variability of a hedged foreign bond's return thus equals the variability of the bond's return measured in its local currency (interest plus capital gain or loss), plus the variability of the forward exchange discount or premium, plus a component contributed by the covariation between these components. In practice, the risk of a hedged foreign bond is due almost entirely to variation in local-currency return; that is, the risk is largely foreign interest rate risk. The contribution of changing forward foreign exchange discounts or premiums is negligible.

Of course, most investors do not ordinarily hedge the exchange rate exposures embedded in their foreign bonds. For an unhedged investment, the total rate of return on the bond position will be the sum of the rate of return in local currency and the rate of change in the value of the foreign currency (measured in U.S. dollars).

Just how significant is the latter component? In practice, is exchange rate risk important to an international fixed income investor? Or are the effects of exchange rate changes swamped by the effects of changing foreign bond prices?

Table I classifies the risk of 10-year unhedged foreign bonds into three categories—(1) variation in the bond's local currency return, primarily because of monthly capital gains or losses resulting from interest rate changes; (2) variation in the exchange rate; and (3) covariation. The uncertainty in unhedged foreign bond re-

**Table II** 10-Year Government Bond Performance, 1975–1988 (U.S.-Dollar Investor's Perspective)

Country	Unhedged Mean Return (%)	Hedged Mean Return (%)	Unhedged Risk (%)*	Hedged Risk (%)	Unhedged Return/Risk	Hedged Return/Risk
U.S.	8.9	—	9.5	—	0.94	—
Germany	10.6	12.0	15.7	6.4	0.67	1.87
Japan	15.7	12.6	17.0	7.7	0.92	1.64
U.K.	12.9	12.5	18.3	11.3	0.71	1.10
France	9.6	9.6	13.7	5.8	0.71	1.66
Canada	8.1	8.2	11.6	9.3	0.70	0.88
Netherlands	11.1	12.0	14.6	6.8	0.76	1.78
Average	11.3	11.2	15.2	7.9	0.75	1.49

\* Standard deviation of return.

turns is, on average, more attributable to exchange rate risk than to foreign interest rate risk. In the case of the two most important non-dollar markets—Japan and Germany—exchange rate risk is much more critical. Moreover, exchange rate risk would be of even greater significance, in relative terms, to the returns on shorter-maturity bonds.

#### Individual Bond Performance

How have foreign bonds, hedged and unhedged, performed during the floating exchange rate period? Table II summarizes the data on foreign government bond risk and return from the beginning of 1975 through the end of 1988.

The unhedged foreign government bonds examined generally earned considerably more than the comparable U.S. Treasury bonds. The average foreign 10-year bond returned 11.3 per cent per year, or 240 basis points more than the return from 10-year U.S. Treasuries. Moreover, five of six foreign bonds returned more than U.S. Treasuries did. Only one foreign market—Canada—earned less.

Currency hedging is not designed to *enhance* the returns to a foreign bond position, but to *stabilize* them. There are no strong reasons to believe that hedging increases or decreases return in the long run, beyond the additional transaction costs it imposes.<sup>4</sup> It is thus not surprising to find no clear relation between hedged and unhedged returns. Our results show that hedged returns exceeded their unhedged counterparts in three cases, fell short in two cases and were identical in one case. In five of the six cases, however, returns to the hedged foreign bonds exceeded returns to U.S. Treasuries; the average return of 11.2 per cent exceeded

the return on U.S. Treasuries by 230 basis points.

The major advantage of currency hedging is reduced risk. Table II shows that the reduction in volatility (measured by the standard deviation of return) was substantial for all except Canadian bonds, and even these bonds enjoyed a moderate reduction in risk. The annualized return volatility of the German bonds, for example, dropped to 6.4 per cent (hedged) from 15.7 per cent (unhedged), and Japanese bond volatility went to 7.7 from 17.0 per cent. In fact, the risk reduction afforded by hedging was large enough to reverse the riskiness of unhedged foreign bonds vis-à-vis U.S. bonds. Held unhedged, all the foreign bonds were riskier than U.S. Treasuries, often by a substantial margin. When hedged, five of the six foreign countries' bonds were less risky than U.S. Treasuries.

We can construct a summary measure of the relative attractiveness of an asset by dividing its average return by the standard deviation of its return. Although this ratio ignores some important questions—such as how much of the asset's risk remains after diversifying—it gives a rough measure of how much return a bond holder enjoyed per unit of risk borne. In the case of every foreign bond, hedging increased this return/risk ratio. Five of six hedged bonds outperformed U.S. Treasuries substantially; the return/risk ratio of the sixth (Canada) was only marginally worse. The average foreign bond's return/risk ratio roughly doubled to 1.49 (hedged) from 0.75 (unhedged).

#### Bond Portfolio Performance

Most dollar investors in foreign fixed income securities hold bond portfolios rather than single issues. These investors may be less inter-

**Table III** Unhedged Foreign Bond Performance in Subperiods

Subperiod	Foreign Portfolio			U.S. Treasuries		
	Mean Return (%)	Risk (%)	Return/Risk	Mean Return (%)	Risk (%)	Return/Risk
1975-79	13.2	9.8	1.36	5.7	5.4	1.06
1980-84	2.5	12.3	0.21	10.2	12.2	0.83
1985-88	22.7	14.5	1.56	8.9	9.5	0.94
Entire Period	12.1	12.4	0.98	8.9	9.5	0.94

ested in a particular foreign bond's performance than in how a representative foreign bond portfolio would have performed relative to U.S. Treasuries. To find out, we examined a broadly diversified portfolio of the bonds shown in Table II over the 1975-88 period.<sup>5</sup>

Table III gives the results. When held unhedged, the foreign portfolio had a mean return of 12.1 per cent, with a standard deviation of 12.4 per cent. This produced a return/risk ratio of 0.98, a little better than that of U.S. Treasuries (0.94).

As Table IV shows, hedging reduced the return of the foreign bond portfolio slightly, to 11.5 per cent. But hedging cut the foreign portfolio's risk by more than one-half, to 5.3 per cent. Consequently, the hedged foreign bonds registered a return/risk ratio of 2.19. This result is better than twice the performance ratio recorded by an individual unhedged foreign bond, by the unhedged foreign portfolio or by U.S. Treasuries.

These results strongly suggest that hedged foreign bonds have been a better long-run investment than unhedged foreign bonds.<sup>6</sup> To understand the significance of the risk-return tradeoff from hedged versus unhedged diversification, consider a dollar investor who commits 20 per cent of his resources to the foreign bond portfolio and the remaining 80 per cent to U.S. Treasuries, then hedges some of his foreign bonds' currency risks. Figure A shows what his

mixed dollar/foreign bond portfolio's risk would have been, depending on the share of the foreign bonds he hedged.

Note that investing 20 per cent of the portfolio in foreign bonds lowers the volatility by 0.6 percentage points, even without currency hedging. The volatility of the U.S. Treasury portfolio is 9.5 per cent, compared with 8.9 per cent for the diversified unhedged portfolio. Hedging consistently reduces the riskiness of the diversified portfolio; the more hedged the portfolio, the greater the risk reduction. Combining diversification with full currency hedging lowers the volatility of the fixed income portfolio by 1.3 percentage points, or roughly twice as much as diversification alone. An *unhedged* investor who committed 20 per cent of his resources to foreign markets would have enjoyed only *half* the risk reduction he could have had if he had diversified *and* currency-hedged.

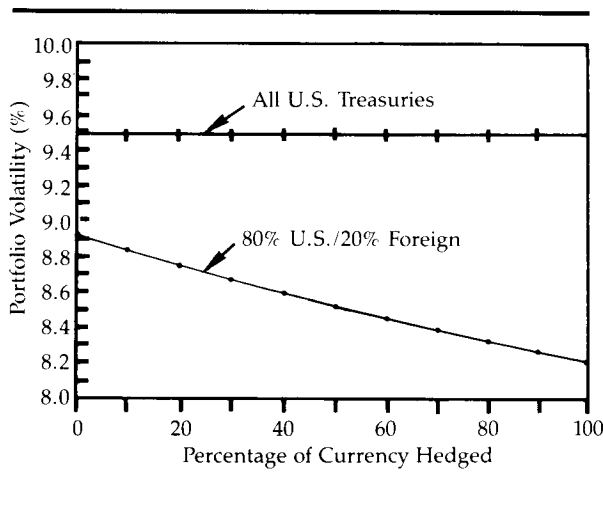
### Hedged Bonds in Internationally Diversified Portfolios

Most investors are familiar with the idea of reducing risk by diversifying. Many fixed income investors spread their credit risks among corporate, agency and government issues. Investors can also reduce interest rate risk to some extent by investing in different segments of the domestic yield curve. Unfortunately, the opportunity to diversify in this way within the U.S. bond market is limited, because all interest rates

**Table IV** Hedged Foreign Bond Performance in Subperiods

Subperiod	Foreign Portfolio			U.S. Treasuries		
	Mean Return (%)	Risk (%)	Return/Risk	Mean Return (%)	Risk (%)	Return/Risk
1975-79	10.5	3.9	2.66	5.7	5.4	1.06
1980-84	13.7	5.4	2.54	10.2	12.2	0.83
1985-88	10.0	6.3	1.58	11.3	9.5	1.19
Entire Period	11.5	5.3	2.19	8.9	9.5	0.94

**Figure A** Risk Reduction from Diversification, 1975–1988



often move in the same direction when the yield curve shifts.

One solution to the problem is to hold some assets in foreign bonds. Foreign bonds carry their own interest rate risks, but they are not directly exposed to U.S. interest rate changes. As long as foreign and U.S. interest rates are not perfectly correlated, some of the interest rate risk will be self-canceling. In general, correlations between the returns on debt instruments in different national markets are much lower than the return correlations between instruments within the U.S. market.

Unfortunately, substituting foreign interest rate risk for dollar interest rate risk by adding unhedged foreign bonds to a dollar portfolio also adds exchange rate risk to the portfolio. Because U.S.-dollar exchange rate changes are highly correlated, exchange rate risk cannot be eliminated by spreading foreign bond holdings across many countries.<sup>7</sup> The gains from unhedged international fixed income diversification can thus be quickly swamped by exchange rate risk.

Hedged diversification, however, is another story. Hedged foreign bonds offer an opportunity to diversify a fixed income portfolio's interest rate risk without adding exchange rate risk. And the potential for risk reduction is substantial. With the exception of Canadian-dollar bonds, the return correlation between 10-year U.S. Treasuries and each of the foreign bonds in our study is below 0.50.<sup>8</sup> Moreover, as Table II showed, hedged foreign bonds are usually less

volatile than similar-maturity U.S. Treasury bonds. Together, these characteristics suggest that hedged foreign bonds offer an attractive opportunity for U.S. investors who wish to reduce interest rate risk in their portfolios.

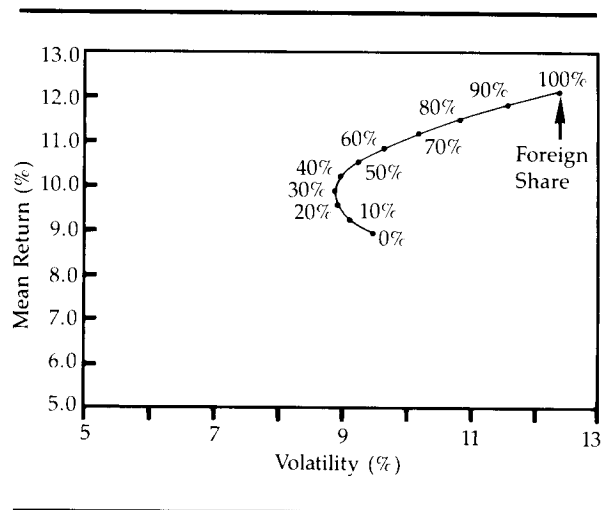
### Hedged and Unhedged Diversification

Figure B illustrates how mixed portfolios containing U.S. Treasuries and unhedged foreign bonds have performed. It shows the average return and volatility of a portfolio that combines a sample foreign bond portfolio with a 10-year U.S. Treasury. The share allocated to foreign bonds varies from 100 per cent (all foreign bonds) to zero (all U.S. Treasuries) in 10 per cent increments.

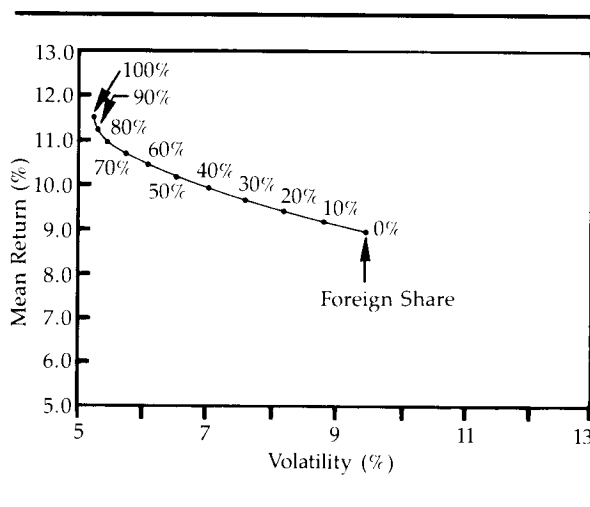
The results are broadly consistent with previous studies of international fixed income investing, which have argued that foreign diversification can increase return at a given level of risk. Because the unhedged foreign bond portfolio had a higher average return than Treasuries—by 320 basis points per year—the greater the investment in foreign bonds, the higher the portfolio's return was.<sup>9</sup> Investing about 30 per cent of assets abroad during 1975–88 would have lowered bond portfolio risk modestly and simultaneously increased return. Any diversified portfolio with less than 55 per cent in foreign bonds would have realized both higher returns and lower risk than U.S. Treasuries alone.

The least risky portfolio—70 per cent dollar and 30 per cent non-dollar bonds—had a stan-

**Figure B** Unhedged Diversified Portfolios, 1975–1988



**Figure C** Hedged Diversified Portfolios,  
1975–1988



dard deviation of 8.9 per cent, compared with 9.5 per cent for a portfolio of only U.S.-dollar obligations and 12.4 per cent for the foreign-only portfolio. In fact, in all but those cases in which foreign bond holdings constituted more than 55 per cent of the portfolio, the volatility of a diversified portfolio was less than that of the 10-year U.S. Treasury bond held alone.

Figure C shows the risk-return tradeoffs for a portfolio of U.S. Treasuries and *hedged* foreign bonds. (As before, the share of foreign assets varies from zero to 100 per cent in 10 per cent increments.) Compared with diversifying into unhedged foreign bonds, hedged foreign bonds offered more risk reduction, with about the same return, at any given level of foreign investment. The least risky hedged portfolio had a standard deviation of 5.3 per cent, versus the 8.9 per cent of the least risky unhedged portfolio. Much of the potential risk reduction realized by diversifying abroad depends on currency hedging.

### What About the Short Run?

These results, of course, are for the 1975–88 period as a whole. To be useful to a prudent portfolio manager, the gains from investing abroad should be consistent—period by period. Knowing that a strategy of diversifying internationally would have produced superior risk/return performance in the long run is likely to be of little consolation if the portfolio underperforms in the short run. The relevant question is: In most short-run periods, did international

diversification both increase return and lower risk?

We are interested in the performance of hedged bonds (that is, our synthetic dollar bonds) within subperiods for another reason, as well: Although our data are historical, their interpretation is designed to guide future investment strategies. One way to assure that our findings are robust—and, therefore likely to be repeated in the future—is to see if they are consistent from subperiod to subperiod.

The entire sample period covers 14 years. Table III divided this into three roughly equal subperiods—1975–79, 1980–84 and 1985–88. The unhedged diversified portfolio registered impressive gains in two periods—13.2 per cent in 1975–79 and 22.7 per cent in 1985–88. During 1980–84, however, its performance badly lagged U.S. Treasuries.

This is not a decisive argument against international diversification in principle. After all, diversification is designed to smooth out the peaks and valleys in asset returns, not to increase return in every period. In terms of realized returns, however, international diversification looked exceptionally good in some years, but extremely bad in others years.

A closer look at the foreign bond portfolio's return history shows that it is highly correlated with dollar exchange rate changes. The foreign bond portfolio performed well in weak-dollar periods but poorly when the U.S. dollar appreciated. Exchange rate risk is apparently the problem. If so, the solution is currency hedging.

Table IV showed the subperiod performance of the hedged foreign bond portfolio. The stability of the hedged portfolio's return is apparent in two ways. First, the range between the highest and the lowest subperiod returns—13.7 and 10.0 per cent—was only 3.7 percentage points. In the case of the unhedged portfolio, the corresponding range was 20.2 percentage points, and the difference between the U.S. Treasury bond's best and worst performances was 5.6 percentage points. Second, in every subperiod the volatility of the hedged foreign portfolio was less than one-half that of its unhedged counterpart.

Hedged foreign bonds also attained a higher return/risk ratio than either U.S. Treasuries or the unhedged portfolio during every five-year period. It is apparent that the superiority of the hedged portfolio's realized return per unit of risk, shown in Table II, was not the result of

unusual market conditions during one subperiod. Rather, the hedged portfolio performed consistently better than either its unhedged counterpart or U.S. Treasuries. All in all, it appears that, by hedging, a U.S. portfolio manager who diversified into foreign bonds outperformed undiversified portfolio managers in each of the short-run periods examined, as well as in the long run.

### Implications for Global Bond Investors

Our results are pertinent to selecting a strategy for global asset allocation. In particular, they demonstrate that participation in foreign fixed income markets does not have to entail exchange rate risks. Forward exchange contracts can be used to currency-hedge non-dollar bonds.

It is advisable to select foreign bonds independently of exchange rate expectations. The currency exposure of the portfolio can then be considered. A decision not to hedge is, in effect, a decision to add an active foreign exchange position—a currency overlay—onto the underlying hedged foreign bond portfolio. Whether or not this is advisable depends on the perceived risks and prospective rewards of bearing currency exposures.

Essentially, we suggest that an unhedged foreign bond position be thought of as a combination of a hedged bond investment and a separate long foreign currency position; forward contracts are the tool used to unbundle these two sources of risk and return. Considered in this framework, our main conclusion is that hedged foreign bonds have been a good buy-and-hold investment, but foreign currency has not. A foreign bond investor who never currency-hedged suffered more volatility, with no significant return advantage, compared with an investor who routinely hedged.

One strong implication of our result is that foreign currencies do not naturally enter into an investor's core holdings for the long run; they are a tactical—not a strategic—asset class. This means that investors who have no opinion concerning the future path of exchange rates should avoid unhedged foreign currency positions.<sup>10</sup> Exchange rate exposures add considerable risk to a bond portfolio—even if they are spread over many currencies. To justify bearing them, an investor *must* expect foreign currencies to outperform their forward rates. And, of course, foreign currencies cannot be expected to outperform their forwards consistently.

As a result, currency-hedging foreign bond holdings should always be the base case.

This does not of course mean that an investor should never assume exchange rate risk. An investor who expects particular currencies to outperform their forwards at particular times can (1) decline to hedge, (2) hedge only partially, (3) over-hedge or (4) cross-hedge, depending on the strength of her exchange rate views.<sup>11</sup> But a decision to assume an exchange rate exposure should be a measured one, which weighs exchange rate risks against the prospective rewards of an open currency position. Exchange rate risks should never be borne by default, just because one happens to own foreign bonds. ■

### Footnotes

1. The mechanics of currency-hedging foreign bond investments are described in L. Thomas, "International Bonds: Stripping Away Currency Risk," *Investment Management Review*, March/April 1988.
2. For complementary analyses, see L. Thomas, "Currency Risks in International Equity Portfolios," *Financial Analysts Journal*, March/April 1988 or Thomas, "The Performance of Currency Hedged Foreign Equities" (Goldman, Sachs & Co., New York, July 1988). For currency hedging from a U.K. sterling or Japanese yen perspective, see Thomas, "The Role of Currency Hedging in U.K. Investment Portfolios," in *Competitive Strategies for Asset/Liability Management* (London: IFR Publishing Ltd., 1988) and Thomas, "Rules for Global Asset Allocation," *Security Analysts Journal* (Security Analysts Association of Japan), forthcoming.
3. Moreover, you can reduce this risk by rebalancing the hedge frequently.
4. These costs are typically small in the foreign exchange markets.
5. The foreign bond portfolio weights are: Japan, 30 per cent; Germany, 25 per cent; France and the U.K., 15 per cent each; Canada, 10 per cent; Netherlands, 5 per cent.
6. An investor who correctly predicted when foreign currencies would appreciate and used this information to hedge selectively would of course have done much better. There is some evidence that outforecasting the forward foreign exchange market is possible. See, for example, J. Bilson and D. Hsieh, "The Profitability of Currency Speculation," *International Journal of Forecasting* 3 (1987), No. 1.
7. Currency-hedging reduced the volatility of the foreign bond portfolio by about as much as it reduced the volatility of investments in the aver-

*Footnotes concluded on page 60*

6. The duration of the 10 per cent five-year coupon bond is 4.17 years, while that of the MBS is 4.10 years.
7. See P. M. Zorn and M. J. Lea, "Mortgage Borrower Prepayment Behaviour: A Microeconomic Analysis with Adjustable Rate Mortgage Data" (Paper presented at the Mortgage-Backed Securities Conference, University of Waterloo, May 8, 1988).
8. Recent Canadian experience shows that very high interest rates have coincided with a sharp fall in house prices and an exceptionally high level of defaults (e.g., Alberta in 1981–82). If MBSs had existed at this time and were backed by such mortgages, the high rate of defaults would have translated into early prepayments in a regime of high interest rates. Thus, under such a scenario, the effective prepayment rate would rise as interest rates rose.
9. See J. Green and J. Shoven, "The Effects of Interest Rates on Mortgage Prepayments," *Journal of Money, Credit and Banking*, 1986.
10. This follows E. S. Schwartz and W. N. Torous, "Prepayment and the Valuation of Mortgage-Backed Securities" (Working paper no. 11–88, School of Management, University of California, Los Angeles, 1988).
11. *Ibid.*
12. M. J. Brennan and E. S. Schwartz, "A Continuous Time Approach to the Pricing of Bonds," *Journal of Banking and Finance* 3 (1979), pp. 133–155, and K. P. Sharp, "Applications of Stochastic Models of Interest Rates" (Ph.D. thesis, University of Waterloo, 1988).

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Thomas footnotes concluded from page 31.

- age single foreign bond market. This indicates that exchange rate risks are systematic within the foreign portfolio. That is, exchange rate risks cannot be eliminated merely by spreading foreign bond holdings across many countries.
8. The hedged foreign bonds' correlations with U.S. Treasuries from 1975 through 1988 were: Germany, 0.42; Japan, 0.25; U.K., 0.19; France, 0.22; Canada, 0.69; Netherlands, 0.26. In recent years, the correlations have increased—a predictable side-effect of informally managed exchange rates ("target zones").
  9. Historical returns are, of course, notoriously poor predictors of future returns. One should not conclude that the average foreign bond will have a substantially higher return than a comparable-maturity U.S. Treasury in the future.
  10. Compare this with equity investing. An investor who does not have strong opinions about which stocks are likely to outperform the market should diversify over many issues. But an investor who has no currency views should not diversify. Instead, he should denominate all of his portfolio—synthetically, where necessary—in his domestic currency.
  11. By cross-hedging we mean transforming one risky exchange rate exposure into another, more attractive exposure. A dollar investor who wanted to hold German bonds but expected the pound to appreciate could buy a Bundesanleihen and simultaneously sell marks forward for sterling. The result would be a synthetic bond with German interest rate risk but pound/dollar rather than mark/dollar exchange rate exposure.