Global Asset Allocation in the Real World

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For those implementing global investment strategies for the first time, taking advantage of others’ experiences in international diversification for different clients or in different base currencies can be helpful. Experience helps distinguish between academic principles and conventional wisdom that hold true in global financial markets and those that do not. Changing base currencies forces investors to view the world from a different perspective because of interest rate patterns, and the resulting portfolios often end up with different asset allocations than would be the case if a U.S. dollar base were used.

This presentation highlights some of the theories and conventional wisdom about international diversification—such as return patterns, volatilities, risk reduction, market timing versus policy asset allocations, stock and industry picking, and the role of currency hedging—that do not always hold in the real world. The discussion covers the effects and causes of differences between global reality and theory and suggests a common approach for dealing with varying investor situations and currencies.

Conventional Wisdom versus Reality

Important theoretical findings based on certain assumptions that are held to be true become conventional wisdom—sometimes even when the assumptions change. In the complex financial world, reality often challenges such conventional wisdom. Golden rules of investing that must be reexamined in an international context include the following:

- Bond returns are consistently less volatile than equity returns. Thus, to reduce risk, portfolios should be allocated to bonds rather than equities.
- The longer one’s time horizon, the more one can tolerate volatility. Thus, investors with long-term horizons should prefer stocks to bonds.
- International diversification is a necessity in any portfolio because it significantly reduces risk.
- Getting the long-term asset allocation correct is more important than market timing.
- Asset allocation is everything; industry or stock selection is nothing.
- A sizable part of foreign assets, if not all, should be hedged against currency losses.

These golden rules seem straightforward. The question is: Do they apply to international diversification in the real world?

Return and Risk. The conventional wisdom regarding the relative returns and risks of bonds and equities tends to hold true in the global market as well as the U.S. market for long horizons. Table 1, for example, shows similar return and risk patterns for long-term bond and equity assets denominated in two different base currencies—the U.S. dollar and the Swiss franc. Stock and bond volatilities in U.S. markets and at the world level depend on the time period studied, however, and for short time periods, volatilities show no clear relative patterns.

International Diversification. A portfolio’s return is simply the weighted average of the returns of each asset in the portfolio, but its volatility will be lower than the average of the individual volatilities.
if the covariance of each pair of assets is low. Thus, conventional wisdom asserts that international diversification, whether the return on foreign assets is or is not greater than the return on domestic assets, significantly reduces risk by adding assets that have low correlations with domestic assets. But international diversification raises new issues.

First, although international diversification should reduce risk, it introduces currency risk—more so for bonds than equities. Currency risk significantly increases bond volatility, as Figure 1 shows. In local-currency terms, a yen bond for a Japanese investor and a German mark bond for a German investor have roughly the same return pattern and level of volatility for these time periods. The volatility of Japanese bonds and German bonds, however, is more than double for a U.S. dollar-based investor, regardless of the time period.

In the case of equities, the added volatility for the U.S. dollar-based investor is much less. Indeed, during recent time periods, as Figure 2 shows, the volatility of German stock returns in U.S. dollars has actually been less than the volatility in German marks. Most of the large-capitalization stocks in developed countries such as Germany are those of huge multinationals that generate earnings throughout the world. Thus, when their earnings are expressed in a world reference currency such as the dollar, the volatility of the earnings is less than when those foreign earnings and the valuation of foreign earnings are translated into German marks.

The conventional wisdom that bonds are much less volatile than equities may not be true globally when returns are measured in dollars for a U.S.-based investor. As the comparison in Figure 3 suggests, the volatility of non-U.S. stock and non-U.S. bond returns generally shows the conventional pattern of less volatility for bonds than equities, but the volatility of non-U.S. bonds for a U.S.-based investor rises to approximately 12–15 percent annual standard deviation.

Correlations. Gaining the benefits of international diversification rests on the assumption that correlations between markets are low. In truth, foreign markets do react differently from U.S. markets to the same events. As Figure 4 shows, the major world financial markets provide a U.S. bond investor more diversification than a U.S. equity investor. After taking the currency effect into account, U.S. bond returns have a very low correlation with foreign bonds. The U.S. equity market has a relatively high correlation, however, with the world index, the European index, and countries such as the United Kingdom, Canada, and the Netherlands. The correlation of U.S. equities with the Morgan Stanley Capital International EAFE (Europe/Australasia/Far East) Index is lower. The correlation of U.S. securities with Japanese securities has been low in the 1987–96 period because of currency issues and local market movements. (Note also the low correlation between U.S. equity and U.S. bond returns.)

Although financial theory suggests that the world financial markets are becoming more integrated, correlation data do not clearly indicate such a trend. Emerging markets have become closely integrated into the mainstream of the world investment universe, but correlations among industrialized countries are not increasing. As Figure 5 shows, correlations exhibit no clear pattern over time and depend on the time period measured. For example, during a number of short time periods, such as 1971 through 1975, the correlation between U.S. and Japanese equities was relatively high, but for long time periods, such as 1970 through 1996, the correlation has been relatively low. In short, although investment professionals may sense that the world is becoming a Global Village, many notable exceptions to increasing correlation exist in the data.

International asset allocation. The theoretical benefits of international diversification for a U.S.-based investor can be clearly demonstrated by the changes that occur in the efficient frontier as non-U.S. assets are added to a portfolio’s investment universe. These benefits are not so easily seen, however, from another home country’s perspective. This outcome is a bit disturbing because the results and investment rules should be the same in any base currency or from any national perspective. Furthermore, different time periods will produce different results.

The effect of currency gains and losses. From a theoretical standpoint, currency gains and losses balance out over the long-term, but in the real world, currency depreciation or currency appreciation can
Figure 1. Annual Bond Return Volatility: U.S. Dollar, Japanese Yen, and German Mark Bonds

- **U.S. Bonds**
- **Japanese Bonds**
- **German Bonds**

Volatility (%) in U.S. Dollars and Volatility (%) in Domestic Currency.
Figure 2. Annual Stock Return Volatility: U.S., Japanese, and German Stocks

**U.S. Stocks**
- 70–96
- 75–96
- 80–96
- 85–96
- 1970s
- 1980s
- 1971–75
- 76–80
- 81–85
- 86–90
- 91–95
- 92–96

**Japanese Stocks**
- 70–96
- 75–96
- 80–96
- 85–96
- 1970s
- 1980s
- 1971–75
- 76–80
- 81–85
- 86–90
- 91–95
- 92–96

**German Stocks**
- 70–96
- 75–96
- 80–96
- 85–96
- 1970s
- 1980s
- 1971–75
- 76–80
- 81–85
- 86–90
- 91–95
- 92–96

Volatility (%)
extend throughout short periods. Thus, currency gains and losses are a significant part of total returns. Figure 6 demonstrates the significant impact currency has on total returns. For example, the yen, even though it is currently a weak currency, nevertheless shows 100 percent appreciation against the dollar over the 12 years shown. The U.K. pound sterling, which is closely correlated with the U.S. dollar, shows a 40 percent appreciation against the dollar. For investors based in a traditionally strong currency like the Swiss franc, long-term currency losses are implied by holding hedge investments (i.e., foreign assets as viewed from Switzerland, such as the U.S. equity and bond markets).

Currency moves interact with specific market features to result in wide differences in the relative volatility of bonds and equities. Specific equity or bond markets may be more or less sensitive to interest rates, which produce various risk–return patterns and correlations. For example, for a pound-based investor, such major foreign equities as U.S. stocks do not carry much more risk than domestic equities. The risk levels are roughly plus or minus one percentage point in volatility. For a Japanese investor, Japanese equities are very volatile and U.S. and similar foreign stocks are slightly less volatile than domestic stocks.

Viewed from small volatile markets, such as Italy (which has about 25 percent annual volatility), investing in major foreign equities is a defensive strategy. The U.S. equity market is much less volatile than the Italian market for an Italian investor, even after the effects of currency risk. On the other hand, U.S. bonds are three times more volatile for a Swiss investor than domestic Swiss bonds. That is not to say that Swiss investors should not invest in U.S. bonds, only that these instruments are very risky for Swiss franc-based (or German mark-based) investors.

The investment kaleidoscope. Asset returns, currency risks, and correlation patterns make for a dizzying array of asset allocation combinations when the vantage point shifts from one country to another. Investors from different countries will have different perspectives on the ideal country and asset allocation. The Swiss equity market, for example, has a relatively high correlation with Wall Street and the world indexes because it is dominated by a few big multinationals that tend to react to major world news and financial events as other multinationals react. Switzerland has a correlation of 60–70 percent with most major markets, and correlations with other major markets for Dutch equity investors exhibit an even stronger pattern. Thus, counter to financial theory, because of relatively high correlations between markets, investing in other markets is often not as good a diversification technique for many global
investors as it is for a U.S. or Japanese investor.

Local-currency efficient frontiers. When everything is put together, global investors have as many solutions, or as many answers to the diversification question, as they have possible combinations of assets and base currencies. The base currency has a significant impact on risk–return relationships and efficient frontiers. Figure 7 depicts the effect of various global diversification strategies on investors based in four currencies for the 1987–96 period. As Panel A of Figure 7 shows, currency volatility, reducing the reward-to-variability ratio, flattens the efficient frontier for U.K. investors, although pound-based investors can still achieve either more return or less risk by international diversification. Even though U.K. markets have a relatively high correlation with the U.S. markets, the pound sterling is a smaller currency and tends to have a life of its own, with currency volatility reducing pound-based stock and bond returns. Thus, bonds for pound-based investors are more volatile than they are for U.S. dollar-based investors; U.K. investors can achieve the best risk–return trade-off by low-risk investing.

Canadian dollar-based investors can achieve significant benefits through non-U.S. international diversification in addition to investing in the United States. As Panel B shows, the slope of the efficient frontier increases significantly when international assets are added.

The efficient frontiers shown for the yen-based
Figure 5. Correlation of U.S. Stock Returns with EAFE, European, and Japanese Stock Returns

U.S. and EAFE Stocks

U.S. and European Stocks

U.S. and Japanese Stocks
Figure 6. Changes of Three Currencies against the U.S. Dollar and the Swiss Franc
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Investor in Panel C provide a prime example of the benefits of global diversification—zero return for 23 percent annual volatility for yen-based investors in Japanese equity alone versus more than 15 percent return with global equity investing for the same level of risk.

During the same time period, the picture in the Netherlands argues a reverse proposition for Dutch investors. International investing for a guilder-based investor in this period offered lower stock and bond returns for the same level of risk than domestic investing. Venturing outside the Netherlands was not worth the trouble.

These results are obviously specific to this data set and time period, but the results nevertheless cast doubt on the conventional wisdom on international asset allocation.

**Market Timing versus Buy and Hold.** Two of conventional wisdom’s golden rules of investing are (1) long-term asset allocation is much more important than trying to time the market and (2) market timing is counterproductive and does not add value. As to the first point, asset allocation is certainly important in efficient markets; research shows that asset allocation accounts for as much as 95 percent of...
Market timing is counterproductive if the market is efficient. Investors must stay in the market because they cannot predict the good periods. According to Shilling, compound returns of U.S. stocks in the DJIA in the 1946–91 period averaged 11.2 percent annually—a 116-times increase during the period. Excluding the returns of the best 50 months during the same period would have reduced annual compound returns to 3.7 percent. No wonder conventional wisdom implies that investors should stay in the market in order not to miss the good periods.

Market timing, however, does have some appeal. In Shilling’s research, if investors could have

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gotten out of the market during the 50 worst months, their compound annual returns would have jumped to 19.0 percent—a 2,541-times increase over the period. Thus, although it is good to remain invested to avoid missing rising markets, it is even better to avoid falling markets.

At the world level, market timing is even more important than at the domestic level because major financial markets experience distinctive periods of over- and underperformance. It is better for a portfolio to be less than optimally diversified than to penalize returns. History provides plenty of examples to demonstrate this point, such as the spectacular outperformance of U.S. stocks in 1995 and 1996 and the underperformance of Japanese stocks in the 1990s. After a stellar performance in the last part of the 1980s, when it completely ignored the 1987 crash, the Japanese stock market went into a nearly seven-year period of underperformance in terms of local-currency returns. Portfolios with passive asset allocations in Japan experienced significantly reduced portfolio returns, so investors saw the wisdom of maintaining flexibility or following a strategy of bailing out of the Japanese market at such times. The result was increased popularity of ex-Japan world and regional equity indexes. The Japanese market share of the world stock index diminished sharply. In summary, even if theoretical support exists for long-term asset allocation, from a global perspective, distinct opportunities remain for getting in or out of certain markets.

**Asset Allocation versus Industry/Stock Picking.** Given the importance of asset allocation, conventional wisdom says that investors should forget industry and stock selection. In global markets, however, certain industries or segments react differently to world events, such as changes in interest rates and currency movements, than the rest of the world market. For example, although the broad Tokyo stock index (TOPIX) underperformed during the 1995–97 period, with a –10.95 percent return, investors could have nevertheless achieved attractive returns in certain sectors. As Figure 8 shows, the TOPIX Exporters Index, with a 15.66 percent return, outperformed the broad TOPIX index while the TOPIX Banking Index, at –25.44 percent, was underperforming the broad Japanese market. The challenge in the Japanese market is to find sectors, such as the big electronic sector that includes Sony Electronics Inc. and Canon Inc., that avoid the underperformance of the broad Japanese market. The only risk to that sector is that it tends to react to events in the same way that European or U.S. stocks react.

**The Hedging Issue.** Exchange rate changes frequently exceed the forward interest rate spread, which adds to total volatility. Extensive research sup-

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**Figure 8. Comparative Performance of Japanese Stock Market, Bank Stocks, and Exporter Stocks, 1995–97**

![Figure 8](https://example.com/f8.png)
ports the argument for full and systematic hedging of currency risk, which is supposed to sharply reduce volatility while continuing to allow diversification among assets with low correlations. According to this approach, all investors, regardless of base currency, should assume only a small amount of currency risk and hedge the majority of their foreign holdings. Thus, everyone should have roughly the same exposure to foreign markets.

Although theoretical support exists for universal hedging, the supporting arguments do not hold true in the real world. Conventionally, a currency's contribution to total return is often assumed to be unsystematic, but long-term appreciation or depreciation trends in recent history have occurred for fundamental reasons. For example, the Swiss franc has been a strong currency because Switzerland has a structural current-account surplus as a result of large amounts of Swiss-controlled overseas investments. In short, certain currencies tend to be strong and to appreciate over the long run. Because the countries have consistently lower interest rates, hedging will be much more costly for investors based in the strong currencies—for example, a Swiss franc-based investor, a yen-based investor, or even a German mark-based investor—than for a U.S. dollar- or U.K. pound-based investor. The dilemma is that, although hedging is costly, investors based in the strong currencies are most likely to incur foreign exchange losses on their international portfolios.

This dilemma can be solved, but solutions for bonds and equities differ. Because of the strong covariance between exchange rates and interest rates, currency risk is a major component of the total risk for bonds but not so major for equities. Bond holdings are highly sensitive to currency risk because currency rates are influenced by interest rates, so common factors explain the behavior of bonds and currency risk. Currency risk adds little extra volatility to equities and, in some cases, even decreases volatility. Thus, as several researchers have concluded, hedging is more appropriate for bond holdings than for equity holdings. At the same time, the net total return on hedged foreign bonds may be unattractive when hedging costs are exceptionally high, so one might challenge the wisdom of investing in international bonds altogether—precisely what investors tend to do in practical terms.

Equity investors should be unhedged and broadly diversified, whereas bond investors should be invested in domestic bonds or in bonds closely correlated with the home currency. Hedging should be more frequent for bond investors, but because hedging severely affects returns, bond investing should be more tactical. For example, European investors could be more opportunistic by investing in Japanese or U.S. bonds, whereas on other occasions, U.S. investors could invest in European bonds.

A Common Approach

Defining a common investment approach for investors with different investment goals, time horizons, risk constraints, and base currencies is a complicated and challenging task. Kahn, Roulet, and Tajbakhsh have pointed out that global asset allocation lies at the heart of global investing. They explain that global asset allocation involves a three-step process: first, forecasting expected returns by asset classes—the “art” in global investing—second, building optimal mean–variance portfolios, which requires defining an appropriate benchmark for global asset allocation, and finally, conducting out-of-sample performance analyses of optimal portfolios using Sharpe ratios, information ratios, and cumulative return plots.

At each of the three steps, investors and portfolio managers encounter real-world problems. First, many investors have little familiarity with forecasting expected absolute returns, and forecasting expected excess returns is even less intuitive, especially in remote markets. Second, forecasting international asset returns in a single currency means forecasting the foreign exchange market—the most unpredictable of all markets. In addition, mean–variance optimization models are challenging. They are very sensitive to changes in return, correlation, and volatility. Even small changes in these variables can have a significant impact on the optimal allocation. A 10 basis point difference in expected returns may direct the model to, for example, recommend selling all the Dutch holdings and buying into Japanese holdings. Furthermore, the choice of benchmark is extremely important. Finally, out-of-sample testing may be inadequate because reliable historical data are lacking. Nevertheless, the challenge remains: how to forecast returns with some precision without producing misleading model results.

Tactical Asset Allocation. If applicable globally, TAA models could provide valuable help in

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fine-tuning return forecasts. TAA models are based on the assumption that asset valuations are linked and self-correlate to the average or long-term equilibrium. The models are good tools for defining expected return, especially excess return over cash, at any given period. Whether such models use a single factor, such as risk premiums, or several factors, they define the current point in the divergence and convergence cycle, which requires analytical methods that can be applied from one asset to another and that remain constant over time.

TAA models may work in a domestic universe but not work in a global universe. Models based on risk premiums may not be adequate or appropriate for international assets because international markets have differing historical return patterns and behavior. For example, some European markets have had consistently negative risk premiums for bonds versus equities, whereas other markets have had positive risk premiums. The return patterns of equities versus bonds in the former high-interest-rate markets of Europe are no longer relevant because interest rates have dropped to levels comparable to those of major markets. Several researchers have shown that differences in growth rates, inflation, and political risks from one country to another affect not only exchange rates but also asset valuations. Thus, one cannot use a TAA model that works in the United States to make comparisons in international markets.

As the search for an international TAA model continues, portfolio managers might consider a multifactor TAA model. At Lombard, Odier & Cie, we put the results in terms of information coefficients, as shown in Table 2. These information coefficients give the predictability of a sophisticated, multifactor model for forecasting bond and equity returns. The results are encouraging but inconsistent. For example, the model is good for forecasting German bond returns but ineffective for forecasting French and Japanese equity returns. The question of why this model works well on some assets and not on others merits its own debate. The conclusion is that using even fairly sophisticated techniques for forecasting markets produces unreliable results if the main goal is to have a broad universe for diversification purposes.

Strategic Asset Allocation. Theory contrasts “strategic asset allocation,” or “policy asset mix,” to tactical, dynamic asset allocation. The strategic approach traditionally confines review and rebalancing of the equity–bond allocations to once a year, whereas the tactical review is seldom done less than monthly. The strategic approach was originally designed for U.S. institutional investors, who operate over the long term and primarily in a single currency. Because some firms’ strategic allocations make frequent adjustments, what those firms call strategic allocation may look like tactical allocation to others.

For a manager whose clients are diversified in terms of time horizon and investment universe, the traditional approach of setting the policy asset mix and changing it only infrequently cannot work. For global portfolios, the strategic approach is to review asset and currency allocations on a monthly, or at least a quarterly, basis. Whether the approach is still worthwhile will depend on the manager’s clients. Exhibit 1 shows the appropriate approach for various types of clients. Note that global institutional clients tend to have their own predefined policy asset mixes and long-term strategic allocations, which differ from one client to another because requirements differ in each country. Because these institutions are fully aware of the risk and return opportunities associated with international diversification, they increasingly demand global balanced benchmarks, an appropriate asset mix, and a good indication of the expected performance of the asset mix that takes into account all the effects of local-currency and common-currency returns. Wide price or exchange rate swings may initiate tactical adjustments. Thus, portfolio managers may find that they need to be more active managers in terms of changing the asset allocation than would be the case for a domestic client base.

Because no single solution exists for each base currency and each type of client, portfolio managers must, first of all, clearly define the investment universe for each client and understand how that universe helps define the client’s long-term investment

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Table 2. Information Coefficients for Selected Asset Classes in a Proprietary TAA Model

<table>
<thead>
<tr>
<th>Country</th>
<th>Bonds</th>
<th>Equities</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>35.4%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Germany</td>
<td>34.7%</td>
<td>17.7%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>—</td>
<td>17.0%</td>
</tr>
<tr>
<td>Italy</td>
<td>17.7%</td>
<td>26.4%</td>
</tr>
<tr>
<td>Japan</td>
<td>12.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Singapore</td>
<td>—</td>
<td>—1.2%</td>
</tr>
<tr>
<td>Spain</td>
<td>—14.2%</td>
<td>39.7%</td>
</tr>
<tr>
<td>Sweden</td>
<td>12.8%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>12.8%</td>
<td>18.0%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>13.0%</td>
<td>25.8%</td>
</tr>
<tr>
<td>United States</td>
<td>18.5%</td>
<td>17.5%</td>
</tr>
</tbody>
</table>

Note: Based on 60 monthly periods to August 1997.

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The importance of allocation in the global context can be seen by comparing the performance of portfolios with similar risk profiles. Figure 9 shows the cumulative long-term return and the volatility of a growth-oriented strategy (roughly 72 percent stocks, 21 percent bonds, 4 percent cash, and 3 percent commodities), a balanced strategy (45 percent stocks, 45 percent bonds, 7 percent cash, and 5 percent gold and commodities), and a conservative strategy (35 percent stocks, 47 percent bonds, 15 percent cash, and 3 percent gold and commodities) for U.S. dollar-based allocations and Swiss franc-based allocations. Asset mixes are constant for the period and assets are diversified globally. Returns and volatility differed significantly depending on the base currency. For example, cumulative returns for the U.S. dollar-based investor following a conservative strategy produced a healthy 300 percent return relative to the 170 percent return for the Swiss franc-based investor pursuing the same strategy. Because the Swiss franc was a strong currency during the 1983–97 period, Swiss franc-based returns, as Figure 9 shows, were more volatile, with sharp periodic downturns.

For some investors, the risk of a loss, or shortfall risk, is more important than simple volatility. Calculating the risk of a loss or a return shortfall, assuming a normal distribution, is relatively easy; controlling return shortfall is easier for some base currencies than for others. Table 3 shows mean annual return, volatility, and frequency of shortfall for the three typical types of portfolios holding constant stock and bond allocations that are diversified worldwide. Although the distributions of returns are attractive for the almost 15-year period since January 1983, different base currencies exhibit different implied and actual return shortfalls. For example, the U.S. dollar-based balanced allocation, which yields an 11.3 percent annual return, has an implied 4.9 percent annual return shortfall (that is, given 7.7 percent volatility of returns, the ex ante implied frequency of a loss of 5 percent or more in any 12-month period is 4.9 percent), but the actual frequency of such a loss was zero. (This distribution is actually not quite normal, because the actual risk observed over time is less than the implied risk.) The absolute mean returns and volatility levels for each strategy from a pound-based perspective are very similar to those from a dollar-based perspective, but the shortfall risk and actual shortfall in almost every case have increased. Pound-based investors would have been well advised to follow the conservative strategy; they would have achieved almost the same return as the other two strategies with the lowest probability of a return shortfall.

For the investor based in the German mark, a strong currency, all three portfolios have lower returns, more volatility (thus relatively high implied shortfall), and higher actual shortfall risk than pound-based or dollar-based investors. For example, the aggressive strategy could experience a 5 percent loss in almost one in seven cases. The results are even riskier for a Swiss franc-based investor. Even a conservative strategy has a sizable risk of shortfall. Moreover, the returns are relatively low.

The return shortfall approach is sensitive to the different perspectives of investors around the world and demonstrates why investors should have different constraints, investment universes, and benchmarks.

## Conclusion

Viewing the world from a global perspective should prompt investors and managers to challenge conventional wisdom in order to implement an effective global investment strategy. Experience as well as research teach the following lessons:

- Most investors need international diversification; it is a good tool for reducing risk.
- The currency issue, however, has a critical influence on both risk and return and must be addressed.
- Systematic adjustments of allocations within a strategy bandwidth must allow for some market timing decisions. Portfolio managers with an international client base will tend to be more active in terms of asset allocation than they...
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would be if they had only domestic institutional clients.
- Over the long term, investing in equities is the only way to achieve sustainable, long-term returns and protect the real value of capital.
- With proper diversification, the volatility of equity returns is tolerable for the long-term investor. Diversification in foreign bonds is more dependent on currency and interest rate developments.
- For some base currencies, currency-hedged bond investments provide a better risk–return profile than do unhedged investments. Active management of bond portfolios—investing or divesting
in bonds depending on the economic cycle and the currency outlook—is an effective way to add value.

In terms of practical issues, allocating assets for a wide range of clients is a complex task. Three steps are helpful in achieving global asset allocation: forecasting returns, optimization, and backtesting. Forecasting is obviously a difficult part of the process. To improve forecasts, managers can check judgmental, top-down, worldwide forecasts against bottom-up views and tactical models. Optimal asset allocation will depend on different constraints in terms of the risk–return expectations of different clients, will vary greatly from one country to another, and will reflect the use of different benchmarks. Strategic asset allocation in a global context requires at least monthly allocation reviews.

### Table 3. Performance of Typical Constant Allocations, 1983–96

<table>
<thead>
<tr>
<th>Currency</th>
<th>Conservative</th>
<th>Balanced</th>
<th>Aggressive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S. dollar base</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean return</td>
<td>9.3%</td>
<td>11.3%</td>
<td>12.8%</td>
</tr>
<tr>
<td>Volatility of returns</td>
<td>4.3</td>
<td>7.7</td>
<td>10.9</td>
</tr>
<tr>
<td>Frequency of a &gt;5 percent loss in any 12-month period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implied</td>
<td>0.5</td>
<td>4.9</td>
<td>8.4</td>
</tr>
<tr>
<td>Actual</td>
<td>0.0</td>
<td>0.0</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>U.K. pound base</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean return</td>
<td>10.7</td>
<td>11.7</td>
<td>12.3</td>
</tr>
<tr>
<td>Volatility of returns</td>
<td>5.3</td>
<td>8.9</td>
<td>12.2</td>
</tr>
<tr>
<td>Frequency of a &gt;5 percent loss in any 12-month period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implied</td>
<td>0.9</td>
<td>5.9</td>
<td>9.9</td>
</tr>
<tr>
<td>Actual</td>
<td>0.0</td>
<td>4.2</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>German mark base</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean return</td>
<td>7.8</td>
<td>9.5</td>
<td>10.7</td>
</tr>
<tr>
<td>Volatility of returns</td>
<td>4.8</td>
<td>8.7</td>
<td>12.4</td>
</tr>
<tr>
<td>Frequency of a &gt;5 percent loss in any 12-month period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implied</td>
<td>1.3</td>
<td>7.1</td>
<td>11.8</td>
</tr>
<tr>
<td>Actual</td>
<td>1.2</td>
<td>7.9</td>
<td>14.6</td>
</tr>
<tr>
<td><strong>Swiss franc base</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean return</td>
<td>7.0</td>
<td>9.1</td>
<td>10.5</td>
</tr>
<tr>
<td>Volatility of returns</td>
<td>5.1</td>
<td>9.1</td>
<td>12.8</td>
</tr>
<tr>
<td>Frequency of a &gt;5 percent loss in any 12-month period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implied</td>
<td>1.9</td>
<td>8.4</td>
<td>12.8</td>
</tr>
<tr>
<td>Actual</td>
<td>3.6</td>
<td>9.7</td>
<td>14.6</td>
</tr>
</tbody>
</table>

*Note: Based on 177 12-month rolling-window periods.*
Question and Answer Session
Patrizio Merciai

Question: How should pension funds react to the fact that the world is becoming more integrated, with consumers using more imports and being exposed to currencies’ effects on their costs of living?

Merciai: As the global economy becomes more integrated, consumers will probably experience more influence from foreign currencies on their domestic price indexes. If you are managing a pension fund, you will have to take this into account when you analyze long-term pension liabilities. You have to consider increasing international diversification to achieve higher returns than would be the case if you were simply anticipating the impact of, for instance, dollar depreciation on imported prices more than on the long-term liabilities of your pension plans. Increasing the level of international diversification is exactly the same as saying that the U.S. dollar may tend to depreciate over time. You need to look at the whole world as a way of compensating or offsetting that dollar depreciation. You can look at it from a micro (pension fund) perspective or in terms of the macro view—defining the investment universe, determining the required returns, and deciding how to achieve them.

Question: What are the strategic implications for global investing of implied shortfalls being different from actual shortfalls?

Merciai: The results shown in Table 3 indicate that the normal distribution is just an assumption. All mean–variance analysis is based on the assumption that returns are normally distributed. In the real world, actual results may be quite different. In this case, implied shortfalls were greater than actual, which is a positive outcome. There is no guarantee, of course, that this outcome will happen again.