PART 6

Topics in International Finance

CHAPTER 17
International Portfolio Theory and Diversification

CHAPTER 18
Working Capital Management

CHAPTER 19
International Trade Finance
LEARNING OBJECTIVES

◆ Separate total risk of a portfolio into two components, diversifiable and non-diversifiable.
◆ Demonstrate how the diversifiable and non-diversifiable risks of an investor’s portfolio may be reduced through international diversification.
◆ Explore how foreign exchange risk is introduced to the individual investor investing internationally.
◆ Define the optimal domestic portfolio and the optimal international portfolio.
◆ Review the recent history of equity market performance globally, including the degree to which the markets are more or less correlated in their movements.
◆ Examine the question of whether markets appear to be more or less integrated over time.

This chapter explores how application of portfolio theory can reduce risks of asset portfolios held by MNEs, and risks incurred by MNEs in general from internationally diversified activities. In the first part of the chapter, we extend portfolio theory from the domestic to the international business environment. Then, we show how the risk of a portfolio, whether it be a securities portfolio or the general portfolio of activities of the MNE, is reduced through international diversification. The second part of the chapter details the theory and application of international portfolio theory and presents recent empirical results of the risk-return trade-offs of internationally diversified portfolios. The third and final section explores international diversification’s impact on the cost of capital for the MNE. The chapter concludes with the Mini-Case, Strategic Currency Hedging.
International Diversification and Risk

The case for international diversification of portfolios can be decomposed into two components: 1) the potential risk reduction benefits of holding international securities and 2) the potential added foreign exchange risk.

Portfolio Risk Reduction

We focus first on risk. The risk of a portfolio is measured by the ratio of the variance of the portfolio’s return relative to the variance of the market return. This is the beta of the portfolio. As an investor increases the number of securities in a portfolio, the portfolio’s risk declines rapidly at first, then asymptotically approaches the level of systematic risk of the market. A fully diversified domestic portfolio would have a beta of 1.0, as shown in Exhibit 17.1.

Exhibit 17.1 illustrates portfolio risk reduction for the U.S. economy. It shows that a fully diversified U.S. portfolio is only about 27% as risky as a typical individual stock. This relationship implies that about 73% of the risk associated with investing in a single stock is diversifiable in a fully diversified U.S. portfolio. Although we can reduce risk substantially through portfolio diversification, it is not possible to eliminate it totally because security returns are affected by a common set of factors—a set we characterize as the market.

The total risk of any portfolio is therefore composed of systematic risk (the market) and unsystematic risk (the individual securities). Increasing the number of securities in the portfolio reduces the unsystematic risk component leaving the systematic risk component unchanged.
Exhibit 17.2 illustrates the incremental gains of diversifying both domestically and internationally. The lowest line in Exhibit 17.2 (portfolio of international stocks) represents a portfolio in which foreign securities have been added. It has the same overall risk shape as the U.S. stock portfolio, but it has a lower portfolio beta. This means that the international portfolio’s market risk is lower than that of a domestic portfolio. This situation arises because the returns on the foreign stocks are closely correlated not with returns on U.S. stocks, but rather with a global beta. We will return to this concept in the section National Markets and Asset Performance later in this chapter.

Foreign Exchange Risk

The foreign exchange risks of a portfolio, whether it be a securities portfolio or the general portfolio of activities of the MNE, are reduced through international diversification. The construction of internationally diversified portfolios is both the same as and different from creating a traditional domestic portfolio. Internationally diversified portfolios are the same in principle because the investor is attempting to combine assets that are less than perfectly correlated, reducing the total risk of the portfolio. In addition, by adding assets outside the home market, assets that previously were not available to be averaged into the portfolio’s expected returns and risks, the investor has now tapped into a larger pool of potential investments.

But international portfolio construction is also different in that when the investor acquires assets or securities outside the investor’s host-country market, the investor may also be acquiring a foreign currency denominated asset. This is not always the case. For example,
many U.S.-based investors routinely purchase and hold Eurodollar bonds (on the secondary
market only; it is illegal during primary issuance), which would not pose currency risk to the
U.S.-based investor for they are denominated in the investor’s home currency. Thus,
the investor has actually acquired two additional assets—the currency of denomination
and the asset subsequently purchased with the currency—one asset in principle, but two in
expected returns and risks.

**Japanese Equity Example.** A numerical example can illustrate the difficulties associated with
international portfolio diversification and currency risk. A U.S.-based investor takes
US$1,000,000 on January 1, and invests in shares traded on the Tokyo Stock Exchange (TSE).
The spot exchange rate on January 1 is ¥130.00/$. The $1 million therefore yields
¥130,000,000. The investor uses ¥130,000,000 to acquire shares on the Tokyo Stock Exchange
at ¥20,000 per share, acquiring 6,500 shares, and holds the shares for one year.

At the end of one year the investor sells the 6,500 shares at the market price, which is
now ¥25,000 per share; the shares have risen ¥5,000 per share in price. The 6,500 shares at
¥25,000 per share yield proceeds of ¥162,500,000.

The Japanese yen are then changed back into the investor’s home currency, the U.S. dol-
lar, at the spot rate of ¥125.00/$ now in effect. This results in total U.S. dollar proceeds of
$1,300,000.00. The total return on the investment is then

\[
\frac{US$1,300,000 - US$1,000,000}{US$1,000,000} = 30.00\%
\]

The total U.S. dollar return is actually a combination of the return on the Japanese yen
(which in this case was positive) and the return on the shares listed on the Tokyo Stock
Exchange (which was also positive). This value is expressed by isolating the percentage
change in the share price \((r_{\text{shares}})\) in combination with the percentage change in the currency
value \((r_{\text{¥/$}})\):

\[
R^s = [(1 + r_{\text{¥/$}})(1 + r_{\text{shares, ¥}})] - 1
\]

In this case, the value of the Japanese yen, in the eyes of a U.S.-based investor, rose 4.00%
(from ¥130/$ to ¥125/$), while the shares traded on the Tokyo Stock Exchange rose 25.00%.
The total investment return in U.S. dollars is therefore

\[
R^s = [(1 + .0400)(1 + .2500)] - 1 = .3000 \text{ or } 30.00\%
\]

Obviously, the risk associated with international diversification, when it includes cur-
currency risk, is inherently more complex than that of domestic investments. You should also
see, however, that the presence of currency risk may alter the correlations associated with
securities in different countries and currencies, providing portfolio composition and diver-
sification possibilities that domestic investment and portfolio construction may not. In
conclusion:

◆ International diversification benefits induce investors to demand foreign securities (the
so-called buy-side).

◆ If the addition of a foreign security to the portfolio of the investor aids in the reduction of
risk for a given level of return, or if it increases the expected return for a given level of risk,
then the security adds value to the portfolio.

◆ A security that adds value will be demanded by investors. Given the limits of the potential
supply of securities, increased demand will bid up the price of the security, resulting in a
lower cost of capital for the firm. The firm issuing the security, the sell-side, is therefore
able to raise capital at a lower cost.
Internationalizing the Domestic Portfolio

First, we review the basic principles of traditional domestic portfolio theory to aid in our identification of the incremental changes introduced through international diversification. We then illustrate how diversifying the portfolio internationally alters the potential set of portfolios available to the investor.

The Optimal Domestic Portfolio

Classic portfolio theory assumes a typical investor is risk-averse. This means that an investor is willing to accept some risk but is not willing to bear unnecessary risk. The typical investor is therefore in search of a portfolio that maximizes expected portfolio return per unit of expected portfolio risk.

The domestic investor may choose among a set of individual securities in the domestic market. The near infinite set of portfolio combinations of domestic securities form the domestic portfolio opportunity set shown in Exhibit 17.3. The set of portfolios formed along the extreme left edge of the domestic portfolio opportunity set is termed the efficient frontier. It represents the optimal portfolios of securities that possess the minimum expected risk for each level of expected portfolio return. The portfolio with the minimum risk among all those possible is the minimum risk domestic portfolio ($MR_{DP}$).

The individual investor will search out the optimal domestic portfolio ($DP$) which combines the risk-free asset and a portfolio of domestic securities found on the efficient frontier. He or she begins with the risk-free asset with return of $R_f$ (and zero expected risk), and moves out along the security market line until reaching portfolio $DP$. This portfolio is

EXHIBIT 17.3  Optimal Domestic Portfolio Construction

An investor may choose a portfolio of assets enclosed by the domestic portfolio opportunity set. The optimal domestic portfolio is found at $DP$, where the Capital Market Line is tangent to the domestic portfolio opportunity set. The domestic portfolio with the minimum risk is designated $MR_{DP}$. 
defined as the optimal domestic portfolio because it moves out into risky space at the steepest slope—maximizing the slope of expected portfolio return over expected risk—while still touching the opportunity set of domestic portfolios. This line is called the *capital market line*, and portfolio theory assumes an investor who can borrow and invest at the risk-free rate can move to any point along this line.

Note that the optimal domestic portfolio is not the portfolio of minimum risk ($MR_{DP}$). A line stretching from the risk-free asset to the minimum risk domestic portfolio would have a lower slope than the capital market line, and the investor would not be receiving as great an expected return (vertical distance) per unit of expected risk (horizontal distance) as that found at $DP$.

**International Diversification**

Exhibit 17.4 illustrates the impact of allowing the investor to choose among an internationally diversified set of potential portfolios. The *internationally diversified portfolio opportunity set* shifts leftward of the purely domestic opportunity set. At any point on the efficient frontier of the internationally diversified portfolio opportunity set, the investor can find a portfolio of lower expected risk for each level of expected return.

It is critical to be clear as to exactly why the internationally diversified portfolio opportunity set is of lower expected risk than comparable domestic portfolios. The gains arise directly from the introduction of additional securities and/or portfolios which are of less than perfect correlation with the securities and portfolios within the domestic opportunity set.

For example, Sony Corporation is listed on the Tokyo Stock Exchange. Sony’s share price derives its value from both the individual business results of the firm and the market in which...
it trades. If either or both are not perfectly positively correlated to the securities and markets available to a U.S.-based investor, then that investor would observe the opportunity set shift shown in Exhibit 17.4.

**The Optimal International Portfolio**

The investor can now choose an optimal portfolio that combines the same risk-free asset as before with a portfolio from the efficient frontier of the internationally diversified portfolio opportunity set. The *optimal international portfolio*, $IP$, is again found by locating that point on the capital market line (internationally diversified) which extends from the risk-free asset return of $R_f$ to a point of tangency along the internationally diversified efficient frontier. We illustrate this in Exhibit 17.5.

The benefits of international diversification are now obvious. The investor’s optimal international portfolio, $IP$, possesses both higher expected portfolio return ($R_{IP} > R_{DP}$), and lower expected portfolio risk ($\sigma_{IP} < \sigma_{DP}$), than the purely domestic optimal portfolio. The optimal international portfolio is superior to the optimal domestic portfolio.

**The Calculation of Portfolio Risk and Return**

An investor may reduce investment risk by holding risky assets in a portfolio. As long as the asset returns are not perfectly positively correlated, the investor can reduce risk because some of the fluctuations of the asset returns will offset each other.

**Two-Asset Model.** Let us assume Trident’s CFO Maria Gonzalez is considering investing Trident’s marketable securities in two different risky assets, an index of the U.S. equity markets and an index of the German equity markets. The two equities are characterized by

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**EXHIBIT 17.5** The Gains from International Portfolio Diversification

![Graph showing the gains from international portfolio diversification.](image_url)
the following expected returns (the mean of recent returns) and expected risks (the standard deviation of recent returns):

<table>
<thead>
<tr>
<th></th>
<th>Expected Return</th>
<th>Expected Risk ((\sigma))</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States equity index (US)</td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td>German equity index (GER)</td>
<td>18%</td>
<td>20%</td>
</tr>
<tr>
<td>Correlation coefficient ((\rho_{US,GER}))</td>
<td>0.34</td>
<td></td>
</tr>
</tbody>
</table>

If the weights of investment in the two assets are \(w_{US}\) and \(w_{GER}\) respectively, and \(w_{US} + w_{GER} = 1\), the risk of the portfolio (\(\sigma_p\)), usually expressed in terms of the standard deviation of the portfolio’s expected return, is given by the following equation:

\[
\sigma_p = \sqrt{w_{US}^2 \sigma_{US}^2 + w_{GER}^2 \sigma_{GER}^2 + 2w_{US}w_{GER}\rho_{US,GER}\sigma_{US}\sigma_{GER}}
\]

where \(\sigma_{US}^2\) and \(\sigma_{GER}^2\) are the squared standard deviations of the expected returns of risky assets in the United States and Germany (the variances), respectively. The Greek letter \(\rho\), \(\rho_{US,GER}\), is the correlation coefficient between the two market returns over time.

We now plug in the values for the standard deviations of the United States (15\%) and Germany (20\%), and the correlation coefficient of 0.34. Assuming that Maria initially wishes to invest 40\% of her funds in the United States (0.40), and 60\% of her funds in German equities (0.60), the expected risk of the portfolio will be

\[
\sigma_p = \sqrt{(0.40)^2(0.15)^2 + (0.60)^2(0.20)^2 + 2(0.40)(0.60)(0.34)(0.15)(0.20)}
\]

which, when reduced, is

\[
\approx \sqrt{0.0036 + 0.0144 + 0.0049} = 0.151 \approx 15.1\%
\]

Note that the portfolio risk is not the weighted average of the risks of the individual assets. As long as the correlation coefficient (\(\rho\)) is smaller than 1.0, some of the fluctuations of the asset returns will offset each other, resulting in risk reduction. The lower the correlation coefficient, the greater the opportunity for risk diversification.

We obtain the expected return of the portfolio with the following equation:

\[
E(R_p) = w_{US}E(R_{US}) + w_{GER}E(R_{GER})
\]

where \(E(R_p)\), \(E(R_{US})\), and \(E(R_{GER})\) are the expected returns of the portfolio, the United States equity index, and the German equity index, respectively. Using the expected returns for the United States (14\%) and German (18\%) equity indexes above, we find the expected return of the portfolio to be

\[
E(R_p) = (0.4)(0.14) + (0.6)(0.18) = 0.164 \approx 16.4\%
\]

**Alteration the Weights.** Before Maria finalizes the desired portfolio, she wishes to evaluate the impact of changing the weights between the two equity indexes on the expected risk and expected returns of the portfolio. Using weight increments of 0.5, she graphs the alternative portfolios in the customary portfolio risk-return graphic. Exhibit 17.6 illustrates the result.

The different portfolios possible using different weights with the two equity assets provides Maria some interesting choices. The two extremes, the greatest expected return and the minimum expected risks, call for very different weight structures. The greatest expected return is, as we would expect from the original asset expectations, 100\% German in composition. The minimum expected risk portfolio, with approximately 15.2\% expected risk, is made up of approximately 70\% U.S. and 30\% German securities.
**Multiple Asset Model.** We can generalize the above equations to a portfolio consisting of multiple assets. The portfolio risk is

\[ \sigma_p = \sqrt{\sum_{i=1}^{N} w_i^2 \sigma_i^2 + \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} w_i \rho_{ij} \sigma_i \sigma_j} \]

and the portfolio expected return is

\[ E(R_p) = \sum_{i=1}^{N} w_i E(R_i) \]

where \( N \) stands for the total number of assets included in the portfolio. By allowing investors to hold foreign assets, we substantially enlarge the feasible set of investments; higher return can be obtained at a given level of risk, or lower risk can be attained at the same level of return.

**National Markets and Asset Performance**

As demonstrated in the previous section, international portfolio construction allows the investor to gather in different expected returns—sometimes higher, sometimes lower—with the real gains arising from reduction in the expected risk of the portfolio.

A multitude of studies have analyzed historical returns from the world’s various equity markets. One of the longest historical time period coverage is that of Dimson, Marsh, and Staunton (2002), who analyzed a century of equity returns over 16 different markets. They found that U.S. equities delivered an inflation-adjusted mean return of 8.7% versus mean returns of 2.1% on Treasury bonds. But they also concluded that the U.S. market was not exceptional, with equity markets in Australia, Germany, Japan, South Africa, and Sweden all exhibiting higher mean returns for the century. Importantly, they also found that equity
returns for all 16 countries exhibited positive mean returns, the lowest being 4.8% in Belgium, and the highest being 9.9% in Sweden.

The true benefits of global diversification do indeed arise from the fact that the returns of different stock markets around the world are not perfectly positively correlated. (Exhibit 17.7 describes U.S. equity market correlations with select global equity markets in recent years.) Because there are different industrial structures in different countries and because different economies follow very different business cycles, we expect smaller return correlations between investments in different countries than between investments within a given country. And in fact, that is what most of the empirical studies indicate.

As demonstrated by Global Finance in Practice 17.1, however, average performances over extended periods of time may be misleading when it comes to assessing market movements and correlations as a result of singular events. A low average correlation over a series of years may prove to be little comfort for those suffering a highly correlated market decline from a singular global disaster.

Exhibit 17.8 presents a comparison of correlation coefficients between major global equity markets over a variety of different periods. The comparison yields a number of conclusions and questions:

◆ The correlation between equity markets for the full twentieth century shows quite low levels of correlation between some of the largest markets (for example, .55 between the U.S. and U.K.).
GLOBAL FINANCE IN PRACTICE 17.1

Market Correlations and Extraordinary Events

Market correlation studies focus on market movements over segments of time, such as monthly average returns over years or blocks of years. But correlation coefficients between markets on singular events, such as major global crises, disasters, or events of global profile, often show near-perfect correlations, with all markets moving identically.

In most cases, the identification of the event (for example the terrorist attacks of September 11, 2001) is relatively easy. In other instances, however, such as the stock market crash of October 19, 1987; the crash of October 13, 1989; or the collapse of the Thai baht on July 2, 1997, instigating the Asian Crisis of 1997; finding a smoking gun is difficult. Whether it be the madness of crowds or unknown forces, the causal event is difficult to find even after the fact. (Michael Mussa often recites a television news story in which the governor of Ohio claimed that a major prison riot was the work of “outside agitators”.)

In some cases in history, however, the correlation in equity market movements displays an interesting twist. On January 17, 1991, the U.S. initiated its counterattack on Iraqi forces which had occupied Kuwait. The date had been watched with intense interest for months as then President George Bush had warned Iraq that it had until that date to withdraw. When no withdrawal occurred, the U.S. attack began on January 17. Nineteen global equity markets all closed up that day, with percentage increases ranging from 1.17% in Toronto to 7.56% in Frankfurt (the DAX). But there was one market that closed down that day—the Johannesburg exchange index. The reason? That is the one equity market in the world, at least at that time, that was dominated by the value of gold—that substance to which many investors run when the world is at risk (as in the spring of 2011), or flee when all seems to be returning to calm.

◆ That same century of data, however, yields a high correlation between the U.S. and Canada (.80) which is relatively high compared to other pairs, but not as high as one might suspect for such highly integrated economies.

◆ The correlation coefficients between those same equity markets for selected subperiods over the last quarter of the twentieth century, however, show significantly different correlation coefficients. For example, the 1977–1986 period finds five of the seven market pairs with lower correlations than the century averages.

EXHIBIT 17.8 Equity Market Correlations Over Time

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>U.S. and Canada</td>
<td>0.80</td>
<td>0.66</td>
<td>0.77</td>
<td>0.78</td>
</tr>
<tr>
<td>U.S. and Denmark</td>
<td>0.38</td>
<td>0.26</td>
<td>0.18</td>
<td>0.46</td>
</tr>
<tr>
<td>U.S. and France</td>
<td>0.36</td>
<td>0.37</td>
<td>0.55</td>
<td>0.56</td>
</tr>
<tr>
<td>U.S. and Germany</td>
<td>0.12</td>
<td>0.24</td>
<td>0.42</td>
<td>0.56</td>
</tr>
<tr>
<td>U.S. and Japan</td>
<td>0.21</td>
<td>0.16</td>
<td>0.26</td>
<td>0.49</td>
</tr>
<tr>
<td>U.S. and Switzerland</td>
<td>0.50</td>
<td>0.38</td>
<td>0.47</td>
<td>0.44</td>
</tr>
<tr>
<td>U.S. and U.K.</td>
<td>0.55</td>
<td>0.40</td>
<td>0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>Average</td>
<td>0.42</td>
<td>0.35</td>
<td>0.47</td>
<td>0.57</td>
</tr>
</tbody>
</table>

When moving from the 1977–1986 period to the 1987–1996 period, six of the seven pairs show higher correlations. This tendency continues when moving from the 1987–1996 period to the 1996–2000 period, when six of the seven pair correlations once again increase.

So what does the future hold for market correlations? Many equity market futurists believe that the digitally integrated global marketplace, combined with the spread of equity cross-listings will probably cause a significant increase in market correlations. Only time—and data—will tell.

Market Performance Adjusted for Risk: The Sharpe and Treynor Performance Measures

Although Exhibits 17.8 and 17.9 provided some insights into the long-term historical performance of individual national markets and key assets, they do not provide a complete picture of how returns and risks must be considered in combination. Exhibit 17.9 presents summary statistics for the monthly returns across 18 major equity markets for the 1977–1996 period. In addition to the traditional measures of individual market performance of mean

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean Return (%)</th>
<th>Standard Deviation (%)</th>
<th>Beta ($\beta_i$)</th>
<th>Sharpe M. (SHP$_i$)</th>
<th>Treynor M. (TRN$_i$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1.00</td>
<td>7.44</td>
<td>1.02</td>
<td>0.078</td>
<td>0.0057</td>
</tr>
<tr>
<td>Austria</td>
<td>0.77</td>
<td>6.52</td>
<td>0.54</td>
<td>0.055</td>
<td>0.0066</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.19</td>
<td>5.53</td>
<td>0.86</td>
<td>0.141</td>
<td>0.0091</td>
</tr>
<tr>
<td>Canada</td>
<td>0.82</td>
<td>5.34</td>
<td>0.93</td>
<td>0.076</td>
<td>0.0044</td>
</tr>
<tr>
<td>Denmark</td>
<td>0.99</td>
<td>6.25</td>
<td>0.68</td>
<td>0.092</td>
<td>0.0085</td>
</tr>
<tr>
<td>France</td>
<td>1.18</td>
<td>6.76</td>
<td>1.08</td>
<td>0.113</td>
<td>0.0071</td>
</tr>
<tr>
<td>Germany</td>
<td>0.97</td>
<td>6.17</td>
<td>0.84</td>
<td>0.089</td>
<td>0.0065</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>1.50</td>
<td>9.61</td>
<td>1.09</td>
<td>0.113</td>
<td>0.0100</td>
</tr>
<tr>
<td>Italy</td>
<td>0.96</td>
<td>7.57</td>
<td>0.89</td>
<td>0.071</td>
<td>0.0061</td>
</tr>
<tr>
<td>Japan</td>
<td>1.08</td>
<td>6.66</td>
<td>1.21</td>
<td>0.099</td>
<td>0.0055</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.39</td>
<td>4.93</td>
<td>0.89</td>
<td>0.197</td>
<td>0.0109</td>
</tr>
<tr>
<td>Norway</td>
<td>1.00</td>
<td>7.94</td>
<td>1.02</td>
<td>0.073</td>
<td>0.0057</td>
</tr>
<tr>
<td>Singapore</td>
<td>1.09</td>
<td>7.50</td>
<td>1.01</td>
<td>0.090</td>
<td>0.0057</td>
</tr>
<tr>
<td>Spain</td>
<td>0.83</td>
<td>6.81</td>
<td>0.94</td>
<td>0.060</td>
<td>0.0044</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.37</td>
<td>6.67</td>
<td>0.97</td>
<td>0.143</td>
<td>0.0099</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.10</td>
<td>5.39</td>
<td>0.86</td>
<td>0.127</td>
<td>0.0080</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1.35</td>
<td>5.79</td>
<td>1.06</td>
<td>0.162</td>
<td>0.0089</td>
</tr>
<tr>
<td>United States</td>
<td>1.01</td>
<td>4.16</td>
<td>0.82</td>
<td>0.143</td>
<td>0.0072</td>
</tr>
</tbody>
</table>

The results are computed with stock market data from Morgan Stanley's Capital International Perspectives, monthly.
return and standard deviation (for risk), the individual national market’s beta to the global portfolio is reported as well as two measures of risk-adjusted returns, the Sharpe and Treynor measures.

Investors should examine returns by the amount of return per unit of risk accepted, rather than in isolation (as in simply mean risks and returns). For example, in Exhibit 17.9, the Hong Kong market had the highest average monthly return at 1.50%, but also the highest risk, a standard deviation of 9.61%. (A major contributing factor to its high volatility was, perhaps, the political uncertainty about the future of the British colony after 1997.)

To consider both risk and return in evaluating portfolio performance, we introduce two measures in Exhibit 17.9, the Sharpe measure (SHP) and the Treynor measure (TRN). The Sharpe measure calculates the average return over and above the risk-free rate of return per unit of portfolio risk:

$$\text{Sharpe Measure} = SHP_i = \frac{R_i - R_f}{\sigma_i}$$

where $R_i$ is the average return for portfolio $i$ during a specified time period, $R_f$ is the average risk-free rate of return, and $\sigma_i$ is the risk of portfolio $i$. The Treynor measure is very similar, but instead of using the standard deviation of the portfolio’s total return as the measure of risk, it utilizes the portfolio’s beta, $\beta_i$, the systematic risk of the portfolio, as measured against the world market portfolio:

$$\text{Treynor Measure} = TRN_i = \frac{R_i - R_f}{\beta_i}$$

The Sharpe measure indicates on average how much excess return (above risk-free rate) an investor is rewarded per unit of portfolio risk the investor bears.

Though the equations of the Sharpe and Treynor measures look similar, the difference between them is important. If a portfolio is perfectly diversified (without any unsystematic risk), the two measures give similar rankings because the total portfolio risk is equivalent to the systematic risk. If a portfolio is poorly diversified, it is possible for it to show a high ranking on the basis of the Treynor measure, but a lower ranking on the basis of the Sharpe measure. The difference is attributable to the low level of portfolio diversification. The two measures, therefore, provide complementary but different information.

**Hong Kong Example.** The mean return for Hong Kong in Exhibit 17.9 was 1.5%. If we assume the average risk-free rate was 5% per year during this period (or 0.42% per month), the Sharpe measure would be calculated as follows:

$$SHP_{HKG} = \frac{R_{i,HKG} - R_f}{\sigma_{i,HKG}} = \frac{0.015 - 0.0042}{0.0961} = 0.113$$

For each unit (%) of portfolio total risk an investor bore, the Hong Kong market rewarded the investor with a monthly excess return of 0.113% in 1977–1996.

Alternatively, the Treynor measure was

$$TRN_{HKG} = \frac{R_{i,HKG} - R_f}{\beta_{i,HKG}} = \frac{0.015 - 0.0042}{1.09} = 0.0100$$

Although the Hong Kong market had the second highest Treynor measure, its Sharpe measure was ranked eighth, indicating that the Hong Kong market portfolio was not very
well diversified from the world market perspective. Instead, the highest ranking belonged to the Netherlands market, which had the highest Sharpe (0.197) and Treynor (0.0109) measures.

Does this mean that a U.S. investor would have been best rewarded by investing in the Netherlands market over this period? The answer is yes if the investor were allowed to invest in only one of these markets. It would definitely have been better than staying home in the U.S. market, which had a Sharpe measure of 0.143 for the period. However, if the investor were willing to combine these markets in a portfolio, the performance would have been even better. Since these market returns were not perfectly positively correlated, further risk reduction was possible through diversification across markets.

**Are Markets Increasingly Integrated?**

It is often said that as capital markets around the world become more and more integrated over time, the benefits of diversification will be reduced. To examine this question, we break the 20-year sample period of 1977–1996 into halves: 1977–1986 and 1987–1996. Dividing the periods at 1986, the date coincides with the official movement toward a single Europe. At this time, most European Union countries deregulated their securities markets—or at least began the process of removing remaining restrictions on the free flow of capital across the borders.

Exhibit 17.10 reports selected stock markets’ correlation coefficients with the United States for each subperiod. Only the Danish-U.S. market correlation actually fell from the first to the second period. The Canadian-U.S. correlation rose from an already high 0.66 to 0.77 in the latter period. Similarly, the correlations between the United States and both Singapore and the United Kingdom rose to 0.66 and 0.67, respectively.

The overall picture is that the correlations have increased over time. The answer to the question, “Are markets increasingly integrated?” is most likely “yes.” However, although capital market integration has decreased some benefits of international portfolio diversification, the correlation coefficients between markets are still far from 1.0. There are still plenty of risk-reducing opportunities for international portfolio diversification.

**EXHIBIT 17.10** Comparison of Selected Correlation Coefficients between Stock Markets for Two Different Time Periods (dollar returns)

<table>
<thead>
<tr>
<th>Correlation to United States</th>
<th>1977–86</th>
<th>1987–96</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>0.66</td>
<td>0.77</td>
<td>+0.11</td>
</tr>
<tr>
<td>Denmark</td>
<td>0.26</td>
<td>0.18</td>
<td>−0.08</td>
</tr>
<tr>
<td>France</td>
<td>0.37</td>
<td>0.55</td>
<td>+0.18</td>
</tr>
<tr>
<td>Germany</td>
<td>0.24</td>
<td>0.42</td>
<td>+0.18</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0.13</td>
<td>0.61</td>
<td>+0.48</td>
</tr>
<tr>
<td>Japan</td>
<td>0.16</td>
<td>0.26</td>
<td>+0.10</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.31</td>
<td>0.66</td>
<td>+0.35</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.38</td>
<td>0.47</td>
<td>+0.09</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.40</td>
<td>0.67</td>
<td>+0.27</td>
</tr>
</tbody>
</table>

Correlation coefficients are computed from data from Morgan Stanley’s Capital International Perspectives.
Summary of Learning Objectives

Separate total risk of a portfolio can be separated into two components, diversifiable and non-diversifiable.

- The total risk of any portfolio is composed of systematic (the market) and unsystematic (the individual securities) risk. Increasing the number of securities in the portfolio reduces the unsystematic risk component but cannot change the systematic risk component.

Demonstrate how the diversifiable and non-diversifiable risks of an investor's portfolio may be reduced through international diversification.

- An internationally diversified portfolio has a lower portfolio beta. This means that the portfolio’s market risk is lower than that of a domestic portfolio. This situation arises because the returns on the foreign stocks are not closely correlated with returns on U.S. stocks, but rather with a global beta.

- Investors construct internationally diversified portfolios in an attempt to combine assets which are less than perfectly correlated, reducing the total risk of the portfolio. In addition, by adding assets outside the home market, the investor has now tapped into a larger pool of potential investments.

Explore how foreign exchange risk is introduced to the individual investor investing internationally.

- The international investor has actually acquired two additional assets—the currency of denomination and the asset subsequently purchased with the currency—two assets in one in principle, but two in expected returns and risks.

- The foreign exchange risks of a portfolio, whether it be a securities portfolio or the general portfolio of activities of the MNE, are reduced through international diversification.

Define the optimal domestic portfolio and the optimal international portfolio.

- The individual investor will search out the optimal domestic portfolio (DP) which combines the risk-free asset and a portfolio of domestic securities found on the efficient frontier. The investor begins with the risk-free asset with return of $R_f$ (and zero expected risk), and moves out along the security market line until reaching portfolio DP.

- This portfolio is defined as the optimal domestic portfolio because it moves out into risky space at the steepest slope—maximizing the slope of expected portfolio return over expected risk—while still touching the opportunity set of domestic portfolios.

- The optimal international portfolio, IP, is found by finding that point on the capital market line (internationally diversified) which extends from the risk-free asset return of $R_f$ to a point of tangency along the internationally diversified efficient frontier.

- The investor’s optimal international portfolio, IP, possesses both higher expected portfolio return ($R_{IP} > R_{DP}$), and lower expected portfolio risk ($\sigma_{IP} < \sigma_{DP}$), than the purely domestic optimal portfolio. The optimal international portfolio is superior to the optimal domestic portfolio.

Review the recent history of equity market performance globally, including the degree to which the markets are more or less correlated in their movements.

- Risk reduction is possible through international diversification because the returns of different stock markets around the world are not perfectly positively correlated.

- Because of different industrial structures in different countries and because different economies do not exactly follow the same business cycle, smaller return correlations are expected between investments in different countries than investments within a given country.

Examine the question of whether markets appear to be more or less integrated over time.

- The overall picture is that the correlations have increased over time. Nevertheless, 91 of the 153 correlations (59%) and the overall mean (0.46) were still below 0.5 in 1987–1996. The answer to the question of “are markets increasingly integrated?” is Yes.

- However, although capital market integration has decreased some benefits of international portfolio diversification, the correlation coefficients between markets are still far from 1.0. There are still plenty of risk-reducing opportunities for international portfolio diversification.
CHAPTER 17 International Portfolio Theory and Diversification

MINI-CASE

Strategic Currency Hedging

Strategic currency hedging policy can be an important risk control measure for funds with international assets. Passive currency exposure can be seen as a source of risk with no compensating risk premium. Hedging currency exposure removes return component that is a source of expected risk but not expected return. Leaving assets unhedged could be the correct policy decision, but it should not be the default position. The decision should be based on a systematic analysis of the costs and benefits of currency hedging. Given that currency adds risk, has zero expected excess return over long periods of time, and is relatively inexpensive to hedge, it is puzzling that the international investors’ default position is not 100% hedged rather than the industry norm of 0% hedged.


Sean O’Connor was in his second analytical rotation in the management training program at Zenex Securities. He had been assigned to the international equities division for the past three months, and had now been given the task of reviewing both the theory and evidence related to active currency management of internationally diversified portfolios.

Sean was now reviewing an article which argued that there were at least three basic arguments supporting active currency management. First, unlike equity markets like the New York Stock Exchange, many of the participants who trade daily in the global currency markets are not trading for a profit. Corporate hedgers are trading for hedging purposes; central banks trade in pursuit of a variety of macroeconomic goals. Unlike many other financial markets that meet modern financial efficiency criteria, there is no real consensus of the proper valuation model(s) for currencies. This means that there is a much higher possibility that currency values could deviate for long periods of time from their correct value.

Finally, and quite promisingly, a number of recent studies had indicated that active currency managers do indeed add value to their portfolio performance. Exhibit 1 reports the result of one recent study following 19 active currency managers over a seven-year period. As shown, even at the 75th percentile, active currency managers have had on average positive performance in four of the seven years.

Sean’s review of the studies also reconfirmed a simple but extremely important element of active currency management: the currency strategy must be considered separate from the bond or equity strategy of any portfolio. These markets move on the basis of very different drivers at different points in time, by country. Exhibit 2 on the next page was also quite convincing on this point, as the separable returns and risks on equities and currency pairs for a select set of equity markets were distinct. And, just as importantly, the Sharpe ratios for the hedged versus unhedged portfolios were largely the same. So, in the end, a blanket policy of hedging all currency risk seemingly does not change the risk-return trade-off appreciably.

CASE QUESTIONS

1. According to Exhibit 1, were there a significant number of portfolio managers able to add value to international portfolios through active (selective) currency management consistently over the time period studied?

2. According to Exhibit 2, would the international investor in an Australia portfolio be better off, on average, with a completely hedged or unhedged portfolio?

3. If you were Sean, what would you conclude from this specific study?

EXHIBIT 1
Russell/Mellon Survey of 19 Active Managers

<table>
<thead>
<tr>
<th>Percentile</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
<th>4 years</th>
<th>5 years</th>
<th>6 years</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>25th</td>
<td>3.14</td>
<td>3.13</td>
<td>1.64</td>
<td>1.14</td>
<td>0.94</td>
<td>0.95</td>
<td>1.25</td>
</tr>
<tr>
<td>Median</td>
<td>0.01</td>
<td>0.77</td>
<td>1.04</td>
<td>0.40</td>
<td>0.44</td>
<td>0.63</td>
<td>0.83</td>
</tr>
<tr>
<td>75th</td>
<td>-0.07</td>
<td>0.22</td>
<td>0.36</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.31</td>
<td>0.36</td>
</tr>
<tr>
<td>Mean</td>
<td>1.05</td>
<td>0.98</td>
<td>0.80</td>
<td>0.46</td>
<td>0.35</td>
<td>0.63</td>
<td>1.07</td>
</tr>
</tbody>
</table>

Source: Russell/Mellon Analytical Services, LLC, as quoted by Barclays, June 30, 2003.

1This Mini-Case is fictional. Many of the arguments and concepts utilized are based on “Currency Management: Strategies to Add Alpha and Reduce Risk,” by Andrew Dales and Richard Meese, Investment Insights, Barclays Global Investment, October 2003, Volume 6, Issue 7.
Questions

1. **Diversification Benefits.** How does the diversification of a portfolio change its expected returns and expected risks? Is this in principle any different for internationally diversified portfolios?

2. **Risk Reduction.** What types of risk are present in a diversified portfolio? Which type of risk remains after the portfolio has been diversified?

3. **Measurement of Risk.** How, according to portfolio theory, is the risk of the portfolio measured exactly?

4. **Market Risk.** If all national markets have market risk, is all market risk the same?

5. **Currency Risk.** The currency risk associated with international diversification is a serious concern for portfolio managers. Is it possible for currency risk ever to benefit the portfolio’s return?

6. **Optimal Domestic Portfolio.** Define in words (without graphics) how the optimal domestic portfolio is constructed.

7. **Minimum Risk Portfolios.** If the primary benefit of portfolio diversification is risk reduction, is the investor always better off choosing the portfolio with the lowest expected risk?

8. **International Risk.** Many portfolio managers, when asked why they do not internationally diversify their portfolios, answer that “the risks are not worth the expected returns.” Using the theory of international diversification, how would you evaluate this statement?

9. **Correlation Coefficients.** The benefits of portfolio construction, domestically or internationally, arise from the lack of correlation among assets and markets. The increasing globalization of business is expected to change these correlations over time. How do you believe they will change and why?
10. **Relative Risk and Return.** Conceptually, how do the Sharpe and Treynor performance measures define risk differently? Which do you believe is a more useful measure in an internationally diversified portfolio?

11. **International Equities and Currencies.** As the newest member of the asset allocation team in your firm, you constantly find yourself being quizzed by your fellow group members. The topic is international diversification. One analyst asks you the following question:

> Security prices are driven by a variety of factors, but corporate earnings are clearly one of the primary drivers. And corporate earnings—on average—follow business cycles. Exchange rates, as they taught you back in college, reflect the market’s assessment of the growth prospects for the economy behind the currency. So if securities go up with the business cycle, and currencies go up with the business cycle, why do we see currencies and securities prices across the globe not going up and down together?

What is the answer?

12. **Are MNEs Global Investments?** Firms with operations and assets across the globe, true MNEs, are in many ways as international in composition as the most internationally diversified portfolio of unrelated securities. Why do investors not simply invest in MNEs traded on their local exchanges and forgo the complexity of purchasing securities traded on foreign exchanges?

13. **ADRs versus Direct Holdings.** When you are constructing your portfolio, you know you want to include Cementos de Mexico (Mexico), but you cannot decide whether you wish to hold it in the form of ADRs traded on the NYSE or directly through purchases on the Mexico City Bolsa.

   a. Does it make any difference in regard to currency risk?
   
   b. List the pros and cons of ADRs and direct purchases.
   
   c. What would you recommend if you were an asset investor for a corporation with no international operations or internationally diversified holdings?

**Problems**

1. **The Baltic Sea.** Assume the U.S. dollar returns (monthly averages) shown in the following table for the three Baltic republics. Calculate the Sharpe and Treynor measures of market performance.

<table>
<thead>
<tr>
<th>Market</th>
<th>Mean Return ($R$)</th>
<th>Risk-Free Rate ($R_f$)</th>
<th>Standard Deviation ($\sigma$)</th>
<th>Country Beta ($\beta$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td>1.12%</td>
<td>0.42%</td>
<td>16.00%</td>
<td>1.65</td>
</tr>
<tr>
<td>Latvia</td>
<td>0.75%</td>
<td>0.42%</td>
<td>22.80%</td>
<td>1.53</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1.60%</td>
<td>0.42%</td>
<td>13.50%</td>
<td>1.20</td>
</tr>
</tbody>
</table>

2. **Google and Vodafone.** An investor is evaluating a two-asset portfolio of the following securities:

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Expected Return</th>
<th>Expected Risk ($\sigma$)</th>
<th>Correlation ($\rho$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google (U.S.)</td>
<td>18.80%</td>
<td>22.80%</td>
<td>0.60</td>
</tr>
<tr>
<td>Vodafone (U.K.)</td>
<td>16.00%</td>
<td>24.00%</td>
<td></td>
</tr>
</tbody>
</table>

   a. If the two securities have a correlation of +0.60, what is the expected risk and return for a portfolio that is equally weighted?
   
   b. If the two securities have a correlation of +0.60, what is the expected risk and return for a portfolio that is 70% Google and 30% Vodafone?
   
   c. If the two securities have a correlation of +0.60, what is the expected risk and return for a portfolio that has the minimum combined risk.

3. **Tutti-Frutti Equity Fund.** An investor is evaluating a two-asset portfolio of the following securities:

<table>
<thead>
<tr>
<th>Security</th>
<th>Expected Return</th>
<th>Expected Risk ($\sigma$)</th>
<th>Correlation ($\rho$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutti Equities</td>
<td>12.50%</td>
<td>26.40%</td>
<td>0.72</td>
</tr>
<tr>
<td>Frutti Equities</td>
<td>10.80%</td>
<td>22.50%</td>
<td></td>
</tr>
</tbody>
</table>

   a. If the two equity funds have a correlation of +0.72, what is the expected risk and return for the following portfolio weightings?
   
<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>75%</td>
</tr>
<tr>
<td>B</td>
<td>50%</td>
</tr>
<tr>
<td>C</td>
<td>25%</td>
</tr>
</tbody>
</table>

   b. Which of the portfolios is preferable? On what basis?

4. **Spiegel Chemikalie.** Oriol Almenara is a European analyst and strategist for Mirror Funds, a New York-based mutual fund company. Oriol is currently evaluating the recent performance of shares in Spiegel Chemikalie, a publicly traded specialty chemical company in Germany listed on the Frankfurt DAX. The baseline investment amount used by Mirror is $200,000.

<table>
<thead>
<tr>
<th>Element</th>
<th>Jan 1 Purchase</th>
<th>Dec 31 Sale</th>
<th>Distributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share price, euros</td>
<td>€135.00</td>
<td>€157.60</td>
<td>€15.00</td>
</tr>
<tr>
<td>Exchange rate, US$/euro</td>
<td>$1.3460</td>
<td>$1.4250</td>
<td></td>
</tr>
</tbody>
</table>
PART 6 Topics in International Finance

5. Bastion Technology: British Pound-Based Investors. Using the data above, calculate the annual average capital appreciation rate on Bastion shares, as well as the average total return (including dividends) to a British pound-based investor holding the shares for the entire period shown.

6. Bastion Technology: Euro-Based investors (A). Using the same data, calculate the annual average total return (including dividends) to a euro-based investor holding the shares for the entire period shown. Assume an investment of €100,000. What is the average return, including dividend distributions, to a euro-based investor for the period shown?

7. Bastion Technology: Euro-Based Investors (B). Using the same data—but assuming an exchange rate which began at €1.4844/£ in June 2008, and then consistently appreciated versus the euro 1.50% per year for the entire period. Calculate the annual average total return (including dividends) to a euro-based investor holding the shares for the entire period shown. What is the average return, including dividend distributions, to a euro-based investor for the period shown?

8. Bastion Technology: U.S. Dollar-Based Investors (A). Using the same data, calculate the annual average total return (including dividends) to a U.S. dollar-based investor holding the shares for the entire period shown. Assume an investment of $100,000. What is the average return, including dividend distributions, to a U.S. dollar-based investor for the period shown?

9. Bastion Technology: U.S. Dollar-Based Investors (B). Use the same data, but assume an exchange rate which began at $1.8160/£ in June 2008, and then consistently appreciated versus the U.S. dollar 3.0% per year for the entire period. Calculate the annual average total return (including dividends) to a U.S. dollar-based investor holding the shares for the entire period shown. What is the average return, including dividend distributions, to a U.S. dollar-based investor for the period shown?

10. Kamchatka-Common Equity Portfolio (A). An investor is evaluating a two-asset portfolio which combines a U.S. equity fund with a Russian equity fund. The expected returns, risks, and correlation coefficients for the coming one-year period are as follows:

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Expected Return</th>
<th>Expected Risk (σ)</th>
<th>Correlation (ρ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common equity fund (United States)</td>
<td>10.50%</td>
<td>18.60%</td>
<td>0.52</td>
</tr>
<tr>
<td>Kamchatka equity fund (Russia)</td>
<td>16.80%</td>
<td>36.00%</td>
<td></td>
</tr>
</tbody>
</table>

Assuming the expected correlation coefficient is 0.52 for the coming year, which weights (use increments of 5% such as 95/5, 90/10) result in the best trade-off between expected risk and expected return?

11. Kamchatka-Common Equity Portfolio (B). Rework problem 10, but assume that you have reduced the expected correlation coefficient from 0.52 to 0.38. Which weights (use increments of 5% such as 95/5, 90/10) result in the best trade-off between expected risk and expected return?

12. Brazilian Investors Diversify. The Brazilian economy in 2001 and 2002 had gone up and down. The Brazilian reais (R$) had also been declining since 1999 (when it was floated). Investors wished to diversify internationally—into U.S. dollars for the most part—to protect themselves against the domestic economy and currency. A large private investor had, in April 2002, invested R$500,000 in Standard and Poor’s 500 Indexes which are traded on the American Stock Exchange (AMSE: SPY). The beginning and ending index prices and exchange rates between the reais and the dollar were as follows:

<table>
<thead>
<tr>
<th>Element</th>
<th>April 10, 2002</th>
<th>April 10, 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share price of SPYDERS (U.S. dollars)</td>
<td>$112.60</td>
<td>$87.50</td>
</tr>
<tr>
<td>Exchange rate (Reais/$)</td>
<td>2.27</td>
<td>3.22</td>
</tr>
</tbody>
</table>
a. What was the return on the index fund for the year to a U.S.-based investor?
b. What was the return to the Brazilian investor for the one-year holding period? If the Brazilian investor could have invested locally in Brazil in an interest bearing account guaranteeing 12%, would that have been better than the American diversification strategy?

**Internet Exercises**

1. **Modern Portfolio Theory.** Use the MoneyOnLine site to review the fundamental theories, assumptions, and statistical tools that make up modern portfolio theory.
   MoneyOnLine Limited www.moneyonline.co.nz/
   modern-portfolio-theory

2. **International Diversification via Mutual Funds.** All major mutual fund companies now offer a variety of internationally diversified mutual funds. The degree of international composition across funds, however, differs significantly. Use the Web sites of any of the major mutual fund providers (Fidelity, Scudder, Merrill Lynch, Kemper, and so on) and any others of interest, to do the following:
   a. Distinguish between international funds, global funds, worldwide funds, and overseas funds
   b. Determine how international funds have been performing, in U.S. dollar terms, relative to mutual funds offering purely domestic portfolios

3. **Yahoo! Finance Investment Learning Center.** Yahoo! Finance provides detailed current basic and advanced research and reading materials related to all aspects of investing, including portfolio management. Use its Web site to refresh your memory on the benefits—and risks—of portfolio diversification.
   Yahoo! Finance Learning biz.yahoo.com/edu/ed_begin.html