Portfolio Management in International Capital Markets: A Swiss Perspective

1. Introduction

Traditionally, foreign securities constitute an important component of the portfolio of European investors. It would seem, therefore, that there is no need to discuss the reasons one might have to invest abroad. However, in practice, it is common for investors to hold foreign securities for erroneous reasons and hence to make portfolio choices that could be improved upon. For instance, investors often let their current knowledge of the growth prospects of various economies guide them in how they allocate their fund across countries. Such a practice receives no support from the vast body of research known as modern finance theory, which provides solid reasons to invest abroad and offers helpful suggestions about how to construct portfolios that include holdings of foreign securities.

2. Market efficiency

The central tenet of modern finance theory is that financial markets are efficient[1]. Market efficiency means that available information about a given corporation is reflected in the price of the securities of that corporation. To understand the concept of market efficiency, it is important to remember that investors have enormous incentives to uncover new pieces of information about a company, future interest rates, future economic activity or any other variable which affects asset prices. Fortunes can be made by using information that no other investor knows. However, as soon as an investor starts taking advantage of his most private information, his actions change asset prices so that they come to reflect his information. For instance, if an investor knows that newspapers will publish unfavorable news about corporation Z in a week, he will shorten that corporation's common stock immediately. As the investor shortens more and more of corporation Z's common stock, the price of the common stock falls to reflect the bad news that the investor knows about. However, once the price of corporation Z's common stock has fallen, it is no longer possible to make a profit if one knows that bad news will be announced and, furthermore, the announcement of the bad news will have a negligible impact on the stock price. In summary, markets are efficient because investors work hard to try to make money.

Hundreds of academic papers which test for market efficiency have been published, most of which show that new information is incorporated in asset prices very quickly. While a number of studies have uncovered various types of market inefficiencies, it is fair to say that modern finance theory shows conclusively that one cannot make money in the investment world by reading newspapers carefully. While so-called inside information improves the performance of one's portfolio, the typical investor cannot rely on a steady flow of inside information to guide his portfolio choices.

One might argue that all these studies which show that financial markets are efficient focus mainly on the U.S. financial markets. However, studies of market efficiency have been conducted for most countries which have financial markets[2]. Most studies show that when asset prices are allowed to move freely, they incorporate information quickly. As was demonstrated recently for Swiss common stocks there is no evidence that an unexpected decline in the price is

more likely to be followed by a further decline rather than by an increase[3]. This is evidence in favor of the hypothesis of market efficiency because it means that bad news is quickly incorporated in the stock price. Thus, there is no reason to sell the stock short because its price has already fallen to reflect all the implications of the bad news for the corporation.

3. Two reasons to invest in foreign stock

There are, however, at least two good reasons to invest in foreign stocks. Investing in foreign stocks makes investors better off because it enables them to *diversify* their portfolio and to *hedge* some risks that they care about.

3.1 The benefits of diversification

Consider the Japanese stock market. Looking at the data shows that there is little co-movement between the Japanese stock market and the Swiss stock market. This means that, sometimes, when the Swiss stock market does well, the Japanese stock market does poorly, and reciprocally. One would therefore expect that, for instance, investing half of one's wealth in the Japanese stock market and half in the Swiss stock market would involve bearing less risk than putting all of one's wealth in the Swiss stock market. This is known as *diversifying* one's portfolio, which means simply not putting all of one's eggs in the same basket. Investing abroad creates portfolios with less risk because foreign economies do not move in step with the Swiss economy.

To see how diversification works, we have to be able to measure its effects. Typically, one wants to know the expected return and the variance of the return of given portfolio strategies. The variance is a measure of the possible dispersion of the returns. For a given expected return, less variance is better because it means that the uncertainty about the outcome of a portfolio strategy is smaller. However, in an international context, one cannot directly compare a return in Japanese yen and a return in Swiss francs. Returns have to be translated into a common numeraire. For the moment, we use the dollar as the common numeraire and we will discuss the issue of currency risk later.

From January 1977 to December 1981, the variance of monthly returns for the Swiss stock market was 30.01% while the variance of the monthly returns of the Japanese stock market was 22.33%[4]. To measure the variance of a portfolio invested in equal proportions in Japanese and Swiss stocks, one has to know the covariance between returns on the Swiss and Japanese stock markets, which was, for monthly returns, 10.32%. The covariance is a measure of the comovement of two stock markets; roughly, the higher the covariance, the more likely it is that an increase in one market is accompanied by an increase in the other market. Hence, the higher the covariance, the smaller the diversification benefit because the more likely it is that the foreign market behaves just like the Swiss market. The variance of the monthly returns of the Swiss/Japan portfolio is equal to:

¼ variance of Swiss portfolio
+ ¼ variance of Japanese portfolio
+ ½ covariance of the two portfolios
= ¼ 30.01% + ¼ 22.33% + ½ 10.32%

This amounts to 15.16%. Therefore, the variance of the monthly returns of the Swiss/Japan portfolio is smaller than the variance of the monthly returns of either the Swiss or the Japanese portfolios. This reduction in variance brought about by the inclusion of foreign stocks in a domestic portfolio is the benefit of international diversification. Obviously, there is no reason to add only Japanese stocks. Adding U.S., British and other foreign stocks to the Swiss/Japan portfolio would further reduce the variance of its monthly returns.

At this point, the reader is probably tempted to say: what about the return of the Swiss/Japan portfolio? From January 1977 to December 1981, the dollar monthly return for the Swiss portfolio was 0.763% per month while it was 1.524% per month on the Japanese portfolio. This means that the dollar return per month on the Swiss/Japan portfolio was:

½ average return on Swiss portfolio
+ ½ average return on Japanese portfolio
= ½ 0.763% + ½ 1.524%

which amounts to 1.144% per month. Therefore, the Swiss/Japan portfolio does better than the Swiss portfolio in the return dimension. However, it would be wrong to devote much attention to that return. The point of diversifica-

tion is that it is *always* possible to decrease the variance of an undiversified portfolio by diversifying without changing its *expected* return[5]. This is because, for any required expected return, it is possible to construct a diversified portfolio which will have that expected return. The diversified portfolio always has a lower variance than the undiversified portfolio.

How great are the benefits of international diversification for a Swiss investor? From January 1977 to December 1981, the variance of the monthly returns of a portfolio invested in the major stock markets of the world according to their capitalization was 12.2% and the average monthly return was 0.916%. This means that by diversifying internationally, a Swiss investor can reduce the variance of the dollar return of his portfolio by 60% and still have a higher expected return. Alternatively, with an interest rate of 0.5% per month, the Swiss investor could double his monthly expected return without changing the variance of his portfolio by borrowing twice his investment and putting everything in the widely diversified portfolio[6]. This example shows that the benefits from international diversification for Swiss investors are considerable.

3.2 The hedging benefit

Consider now a Swiss investor who owns a watchmaking factory in Switzerland. His competition is Japanese. If his competition does well, he does poorly. For such an investor, investing abroad can provide insurance against some risk that he cares about – in this case, losing money because his competitor did unexpectedly well. To see this, note that the stock price of his Japanese competitors is likely to increase when he unexpectedly loses money on his factory. Hence, if the Swiss watchmaker invests in these stocks, he buys insurance against the economic risks of his business. Another example of a risk that an investor might care about is the risk of unexpectedly high inflation. An investor in a country with volatile inflation might want to invest in Swiss bonds as an inflation hedge because the real return of such bonds has little variance. These examples show that foreign securities markets offer the opportunity to insure against risks for which domestic securities markets offer no insurance.

4. The currency dimension

It is well-known that exchange rates exhibit substantial volatility. Investing in a Japanese stock means that the Swiss franc return on the investment will be approximately the yen return plus the rate of change of the price of the yen in Swiss francs. One could therefore argue that in the presence of volatile exchange rates, a Japanese stock is more risky for a Swiss investor than for a Japanese investor. The Japanese investor bears only the risk of the yen return while the Swiss investor bears the risk of the yen return plus the risk of the change in the exchange rate. This argument is fallacious in that there is no reason for the Swiss investor to bear the exchange rate risk[8]. First, an investor who has a widely diversified portfolio will own securities in many different countries. As exchange rates do not all move together, there will be a diversification effect among exchange rate risks as well as a diversification effect among stock returns. There is evidence, however, that the diversification effect among exchange rates can be much more pronounced than among common stocks[9]. Hence, in a well-diversified portfolio, the contribution of the variance of exchange rate changes to the risk of the portfolio is likely to be small. Second, it is easy and cheap to remove most of the exchange rate risk from a diversified portfolio of common stocks[10]. Suppose one has a substantial investment in Japanese stocks. Taking a short position in the yen equal to the value of investments in yen removes almost all of the exchange rate risk if the yen value of the investment does not fluctuate too much with the yen/Swiss franc exchange rate. If one cannot take a short position in a yen/Swiss franc forward contract, one can take a short yen futures position and long Swiss francs dollar futures position on the International Money Market in Chicago.

While exchange rate risks cannot be a serious impediment to foreign portfolio investment, what about expected changes in exchange rates? With efficient markets, these expected changes are already incorporated in asset prices. Not investing in Japan because one expects the yen to depreciate does not make sense because the anticipated return on the Japanese stock market *increases* if investors expect the yen to depreciate. If this phenomenon did not take place, it would be possible to achieve

above average returns at no risk by simply borrowing in Japan and investing the proceeds in Swiss bonds. One cannot make or lose money out of expected changes in exchange rates.

This discussion has an important implication for portfolio management because it implies that the currency of habitat of an investor should not affect that investor's holdings of common stocks very much[11]. The benefits of international diversification are substantial enough that an investor is better off to hold a widely diversified portfolio and hedge some exchange rate risks than to hold a portfolio of domestic securities only to avoid bearing exchange rate risks[12]. The currency of habitat of an investor should affect his holdings of bonds, however. This is because the only significant risk of foreign short-term bonds is the exchange rate risk. Hence, foreign short-term bonds should be held only if one wants to bear exchange rate risks.

5. Some difficulties in international portfolio management

While there are benefits from international diversification when viewed from small countries, this does not mean that care should not be used when constructing an internationally diversified portfolio. In the United States there has been a lot of discussion on how to construct an internationally diversified portfolio[13]. To derive the portfolio which has the highest mean return for a given variance, one needs to have some estimate of the expected returns, variances and covariances of the common stocks available. Unfortunately, it is hard to estimate expected returns with much precision. It would, however, be wrong to draw the conclusion that international diversification is a theoretical concept which has no practical use.

No case can be made that Swiss investors would be better off using complicated mathematical techniques to diversify internationally. Just adding foreign stocks to a Swiss portfolio, making sure to select these stocks among different countries and industries, can bring about a substantial improvement in performance. One should, however, be aware that foreign investors are not treated like domestic investors. For instance, the tax treatment often differs: Foreign investors may have to pay special taxes or

fees; foreign stock holdings may be limited; exchange controls can make it difficult to repatriate one's money; foreigners can be victims of expropriation. All these differences between the treatment of domestic and foreign investors have implications for portfolio choice[14]. For example, consider a country which taxes dividends accruing to foreigners at a higher rate whereas capital gains taxes are uniform. Therefore, foreign investors would tend to concentrate their holdings in securities of the country with low dividend yields. This is because securities with high dividend yields have lower after-tax returns for foreign investors than for investors of that country.

6. Active management

It is important to understand that investing on information has a cost in the form of a reduction in the degree of portfolio diversification. There are ways to minimize the loss in diversification[15]. If one's strategy involves going long in some stock, one should consider going short in some other stock or portfolio of stocks that remains unaffected by the information which triggered the action. For instance, if one believes that one has bad information about the American auto industry that is not reflected in stock prices, it can make sense to go short in American auto industry stocks and long in Japanese and German auto industry stocks. This involves a much smaller loss in diversification than just going short in the American auto industry because some of the risks of the long and short positions cancel out. For instance, an unexpected fall in oil prices would most likely increase all auto industry stock prices, so that it would create losses on the short position, but the effect on the value of the long position would cancel out most of the effect on the value of the short position.

Whenever one wants to use information about some economic variable which is not already incorporated in security prices, it is of crucial importance to take a position in those securities which are affected most by changes in that economic variable. This insight of modern portfolio theory is frequently neglected by portfolio managers. For instance, it is forgotten by a manager who invests in Japanese stocks because he expects the Japanese yen to appre-

ciate with respect to the Swiss franc. A Japanese short-term bond will have a Swiss franc return which moves almost one for one with the Swiss franc price of the yen. However, the yen value of a portfolio of Japanese common stocks could fall while the yen appreciates, so that the Swiss franc return to the portfolio would not benefit from the appreciation of the yen.

7. Conclusion

This paper provides a review of what modern finance theory has to say about international portfolio investment. It shows that the benefits of investing abroad for the right reasons can be considerable. While rather naive strategies involving international diversification are shown to be profitable, strategies which in addition take into account the fact that foreign investors are often treated differently from domestic investors are even more advantageous.

Appendix

I. The mechanics of international diversification

To simplify the notation, we consider only two countries, Switzerland and Japan. We use the following notation:

$R_{CH}^{fr}(t)$: Return in Swiss francs on a given Swiss portfolio from date $t-1$ to t.

$R_J^{yen}(t)$: Return in yen on a given Japanese portfolio from date $t-1$ to t.

$d(t)$: Rate of change of the Swiss franc price of a yen from date $t-1$ to t.

With this notation, the Swiss francs return on the Japanese portfolio is:

$$R_J^{fr}(t) = [1 + R_J^{yen}(t)][1 + d(t)] - 1$$
$$= R_J^{yen}(t) + d(t) + R_J^{yen}(t)d(t)$$

The cross-product term $R_J^{yen}(t)d(t)$ arises from the fact that the change in the yen value of the Japanese investment is also affected by changes in the Swiss franc price of the yen. While that cross-product is often negligible, it is not always so.

Let the subscript D denote a diversified portfolio which combines an investment of w in the Swiss portfolio and $(1-w)$ in the Japanese portfolio per dollar invested. At time $t-1$, the expected return of that portfolio over the coming period is:

$$E[R_D^{fr}(t)] = wE[R_{CH}^{fr}(t)] + [1-w]E[R_J^{fr}(t)]$$

The variance of the portfolio's return is:

$$Var[R_D^{fr}(t)] = w^2 Var[R_{CH}^{fr}(t)]$$
$$+ (1-w)^2 Var[R_J^{fr}(t)] + 2w(1-w) \quad Cov[R_J^{fr}(t), R_{CH}^{fr}(t)]$$

Let β_D be the reward to risk ratio of the diversified portfolio. The risk of that portfolio is Var $[R_D^{fr}(t)]$ while the reward for bearing risk is the excess return of that portfolio over the rate of return of a risk-free asset, which is the interest rate in Switzerland for that period, written $R^{fr}(t)$. Hence:

$$\beta_D = \frac{E[R_J^{fr}(t)] - R^{fr}(t)}{Var[R_D^{fr}(t)]}$$

The reward to risk ratio of the Swiss portfolio is:

$$\beta_{CH} = \frac{E[R_{CH}^{fr}(t)] - R^{fr}(t)}{Var[R_{CH}^{fr}(t)]}$$

Diversification is worthwhile if one can form a portfolio with investments at home and abroad such that the reward to risk ratio of that portfolio exceeds β_{CH}. If there is such a portfolio, one can always do better than investing in Swiss stocks alone by investing partly in that portfolio and partly in short-term bonds. To see this, note simply that a portfolio which has the same variance as the Swiss portfolio but is invested in the diversified portfolio has an expected return equal to:

$$R^{fr}(t) + \beta_D Var[R_{CH}^{fr}(t)]$$

while the portfolio invested in Swiss stocks has an expected return of:

$$R^{fr}(t) + \beta_{CH} Var[R_{CH}^{fr}(t)]$$

Hence, whenever $\beta_D > \beta_{CH}$, it pays to take a position in Japanese stocks.

Consider the portfolio for which β_D is highest and denote the highest value of β_D as β_D^*. Obviously, β_D^* is never smaller than β_{CH}, as one can always choose to take no position in Japanese stocks. For β_D^* to be greater than β_{CH} it must be the case that w differs from one, i.e., that one takes a position in Japanese stocks. By taking the derivative of β_D with respect to w, one can compute β_D^*. It can be verified that β_D^* exceed β_{CH}, and hence w differs from one, unless:

$$E(R_{CH}^{fr}) - E(R_J^{fr})$$
$$= 2\left[\frac{Var(R_{CH}^{fr}) - Cov(R_{CH}^{fr}, R_J^{fr})}{Var(R_{CH}^{fr})}\right]$$

where the variable t is omitted. Practically, this condition means that international diversification pays unless the comovement between the two stock markets is very high.

II. The optimal currency hedge

A Japanese bond has a yen return of $R_{JB}^{yen}(t)$. Its Swiss francs return is:

$$R_{JB}^{fr}(t) = [1 + R_{JB}^{yen}(t)][1 + d(t)] - 1$$
$$= R_{JB}^{yen}(t) + d(t) + R_{JB}^{yen}(t)d(t)$$

To hedge the Japanese investment against currency risks, one wants to take a position in the Japanese bond of x per dollar invested in the Japanese portfolio so that:

$$Cov[d(t), R_J^{fr}(t) + xR_{JB}^{fr}(t)] = 0$$

If this condition holds, the Swiss franc return of the total Japanese position is unaffected by unexpected changes in the Swiss franc price of the Yen. Solving for x by using the definition of $R_J^{fr}(t)$ and $R_J^{fr}(t)$, one obtains:

$$x = \frac{Cov[d(t), R_J^{yen}(t)]}{Var[d(t)]} - 1$$

Hence, if $Cov[d(t), R_J^{yen}(t)]$ is equal to zero, the hedge is to go short in Japanese bonds to pay for·one's investment in Japanese stocks as argued in the text. The derivation is similar if one uses forward or futures contracts.

Footnotes

[1] See Fama (1976) for a thorough discussion of the concept of market efficiency and a review of the empirical evidence.

[2] See, for instance, Solnik (1974).

[3] See Vock and Zimmermann (1984).

[4] The data is borrowed from Jorion (1985).

[5] For studies which emphasize the benefits of international diversification, see Lessard (1976) and the references therein.

[6] See Part I of the Appendix for a more formal derivation. The statement in the text requires that markets do not move perfectly in step.

[7] If the investor borrows two dollars for every dollar he owns, he has to pay 1% per month in interest but earns $3 \times 0.916\%$, so his net return is 1.748%. The variance of his return is $3 \times 12.2\% = 36.6\%$. Had the investor put one dollar in the Swiss market portfolio, his expected return would be 30.01% while his monthly average return would have been 0.763%. Hence, by borrowing slightly less than two dollars per dollar he owns, the investor's investments would have a monthly return variance slightly less than 36.6% and a monthly expected return slightly less than 0.763%, which verifies the claim in the text.

[8] However, for the reasons discussed in the previous paragraph, the Swiss investor may want to bear foreign exchange risk. Note also that investors are interested in real returns. If exchange rate changes offset differences in unexpected inflation across countries, it may well be the case that nominal foreign currency returns hedged against exchange rate changes are more risky in real terms than nominal foreign currency returns which are not hedged against exchange rate changes. In this case, investors are not averse to bearing exchange rate risk and the issue of exchange rate risk becomes irrelevant.

[9] Otherwise, one would expect forward exchange rates to be consistently biased predictors of future spot exchange rates. There is no evidence of a large and consistent bias for any currency. See Cumby and Obstfeld (1981) for a discussion of the evidence.

[10] See Lessard and Stulz (1984) and Adler and Simon (1985) for discussions of this. Part II of the Appendix derives the optimal hedge explicitly.

[11] Such a result can be derived formally, see Stulz (1981).

[12] See Solnik and Noetzlin (1982) for useful evidence to that effect.

[13] See Jorion (1985) and the references in that paper.

[14] See Stulz (1984).

[15] See Treynor and Black (1973).

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