International Diversification from a Swiss Perspective

The purpose of this article is to examine from the viewpoint of a Swiss investor the historical and perspective benefits of internationally diversifying a stock portfolio. This article is divided into 6 section.

In the first section we examine the market value of alternative equity markets around the world. It turns out that no country comprises most of the world's wealth. Given the great number of opportunities world wide, we examine whether international diversification is a sensible strategy for Swiss investors. To analyze this question, we first show how returns on foreign assets are computed. The reasonableness of international diversification depends on the correlation coefficient between markets, the risk of each market and the returns in each market. This is the subject of the next sections of this article. One of the major sources of risk in international investment is changes in exchange rates. The impact of exchange risk on international diversification and the possibility of eliminating part of the risk through hedging is examined next. The final section of this article examines the key role of return expectations in determining the benefits of international diversification. Break-even returns are derived.

1. World Portfolio

In discussing the size of capital markets it is interesting to employ the concept of a world portfolio. The world portfolio represents the total market value of all stocks that an investor would own if he or she bought the total of all marketable stocks on all the major stock exchanges in the world. Table 1 shows the percent each nation's equity securities represented of the world portfolio in 1989. In this year the largest equity markets were Japan, which represented 38.9% of the world total, while the next largest was the U.S., which represented 30.3% for the total [1]. All of the major European countries combined only accounted for 25.2% of the world equity market while Switzerland only accounted for 2.90%. For Swiss investor's a large part of the worlds wealth lies outside the investor's home country. International assets could be duplicates of those found in the home country, in this case they do not offer new opportunities, or they could represent opportunities not duplicated in the home country. Which of these possibilities holds needs to be analyzed in order to determine whether international diversification should be an important part of each investor's portfolio. To examine this question we need to analyze the correlation between markets and the risk and return of each market. But before we do this we must first examine how to calculate returns on foreign investments.

Table 1: Comparative Sizes of World Equity Markets (1989). From Morgan Stanley Capital International Perspective, January 1990.

	Area of Country	% of Total
Europe		25.2
	United Kingdom	8.1
	West Germany	3.7
	Switzerland	2.9
	France	3.1
	Netherlands	1.5
	Sweden	1.4
	Italy	1.5
	Spain	1.0
	Belgium	0.6
Pacific Area		41.7
	Japan	38.9
	Australia	1.4
	Singapore	0.6
	Hong Kong	0.7
North America		33.0
	United States	30.3
	Canada	2.7
World		100.0

Note:
Column sums may not equal totals because of rounding error and because percentages for all European countries are not shown.

2. Calculating the Return on Foreign Investments

The return on a foreign investment is affected by the return on the asset within its own market and the change in the exchange rate between the securities own currency and the currency of the purchaser's home country. Thus the return on a foreign investment can be very different than simply the return in the asset's own market and in fact can differ according to the domicile of the purchaser. From the viewpoint of a Swiss investor, it is convenient to express foreign currency as costing so many francs [2]. Thus it is convenient to express the exchange rate of dollars to francs as one dollar costs 1.25 francs. Assume the following information:

Time	1 Cost of One Dollar	2 Value of American Shares	Value in Francs (1x2)
0	1.25 Francs	40 Dollars	1.25 x 40 = 50
1	1.00 Francs	45 Dollars	1.00 x 45 = 45

Further assume there are no cash flows on American shares. In this case the return to the American investor expressed in the home currency (dollars) is

$$(1 + R_H) = 45/40 \text{ or } R_H = 0.125 \text{ or } 12.5\%$$

However the return to the Swiss investor is

$$(1 + R_S) = \frac{1.00 \times 45}{1.25 \times 40} = 45/50 \text{ or } R_S = -0.10 \text{ or } -10\%$$

The American investor received a positive return while the Swiss investor lost money because francs were worth less at time one than at time zero. It is convenient to divide the return to the Swiss investor into a component due to return in the American market and the return due to exchange gains or losses. Letting R_X be the exchange return we have

$$(1 + R_S) = (1 + R_X)(1 + R_H)$$

$$1 + R_x = \frac{1.00}{1.25} = 1 - 0.20 \qquad \text{or } R_x = 0.20$$

$$1 + R_H = 45/40 = 1 + 0.125 \qquad \text{or } R_H = 0.125$$

$$(1 + R_S) = (1 - 0.20)(1 + 0.125) = -0.90 \qquad \text{or } R_S = 0.10$$

Thus the 12 1/2% gain on the American investment was more than offset by the 20% loss on the change in the value of the Swiss Francs. Restating the above equation

$$(1 + R_S) = (1 + R_x)(1 + R_H)$$

Simplifying:

$$R_S = R_x + R_H + R_x R_H$$

In the example:

$$-0.10 = -0.20 + 0.125 + (-0.20)(0.125)$$
$$= 0.20 + 0.125 - 0.025$$

The last term (the cross product term) will be much smaller than the other two terms so that return to the Swiss investor is approximately the return of the security in its home market plus the exchange gain or loss. Using this approximation, we have the following expressions for expected return and standard deviation of return on a foreign security.
Expected Return:

$$R_S = R_x + R_H$$

Standard deviation of return:

$$\sigma_S = [\sigma^2_x + \sigma^2_H + 2\sigma_{Hx}]^{1/2}$$

As will be very clear later when we examine real data, the standard deviation of the return on foreign securities (σ_S) is much less than the sum of the standard deviation of the return on the security in its home country (σ_H) plus the standard deviation of the exchange gains and losses (σ_x). This relationship results from two factors. First, there is very low correlation (ρ_{Hx}) between exchange gains (or losses) and returns in a country (and therefore the last term ($\sigma_{H,x}$) is close to zero). Second, squaring the standard deviation, adding them, and then taking the square root of the sum is less than adding them directly. To see this let

$\sigma_x = 0.10$
$\sigma_H = 0.15$
$\rho_{Hx} = 0$ (to make the covariance zero)

then

$\sigma^2_S = 0.10^2 + 0.15^2$

and

$\sigma_S = 0.18$

Thus the standard deviation of the return expressed in Swiss francs is considerably less than the sum of the standard deviation of the exchange gains and losses and the standard deviation of the return on the security in its home currency. The reader should be conscious of this difference in the Tables that follow. having developed some preliminary relationships it is useful to examine some actual data on risk and return.

3. The Risk of Foreign Securities

Table 2 presents the correlation between the equity markets of several countries for the period 1980-1988. These correlation coefficients have been computed using monthly returns on market indexes. The indexes are computed by Morgan Stanley Capital International and have been adjusted for dividends. They are market weighted indexes with each stock's proportion in the index determined by its market value divided by the aggregate market value of all stocks. the indexes include securities representing approximately 60% of the aggregate market value of each country. All returns were converted to Swiss francs at prevailing exchange rates before correlations were calculated. Thus, the Table presents the correlation from the point of view of a Swiss investor. These are very low correlation coefficients relative to those found within a domestic market. For example, the correlation coefficient between two 100-security portfolios drawn at random from a domestic stock exchange is on the order of 0.95. The numbers in the table are much smaller than this, with the average correlation being 0.388.
The correlations between international indexes is roughly the same as the correlation between two securities in the U.S. and less than the correlation between two securities in most other markets. The

Table 2: Correlations among Stock Indexes Measured in Swiss Francs.

	Australia	Austria	Belgium	Canada	Denmark	France	Germany	HongK.	Italy	Japan	Mexico	NL	Norway	Spain	Sweden	Swiss	U.K
Australia																	
Austria	0.144																
Belgium	0.356	0.332															
Canada	0.672	0.224	0.366														
Denmark	0.322	0.055	0.299	0.409													
France	0.367	0.374	0.576	0.413	0.271												
Germany	0.334	0.478	0.504	0.356	0.290	0.502											
Hong Kong	0.512	0.246	0.306	0.435	0.302	0.264	0.371										
Italy	0.314	0.209	0.366	0.394	0.353	0.461	0.304	0.410									
Japan	0.330	0.024	0.332	0.313	0.273	0.352	0.247	0.248	0.428								
Mexico	0.368	0.129	0.223	0.197	0.013	0.127	0.233	0.299	0.156	0.147							
Netherlands	0.456	0.302	0.529	0.642	0.415	0.527	0.612	0.540	0.404	0.337	0.308						
Norway	0.532	0.216	0.551	0.514	0.371	0.543	0.446	0.446	0.231	0.230	0.296	0.620					
Spain	0.392	0.217	0.297	0.380	0.243	0.389	0.330	0.366	0.418	0.363	0.218	0.351	0.284				
Sweden	0.443	0.221	0.307	0.448	0.243	0.334	0.357	0.424	0.408	0.252	0.303	0.434	0.455	0.314			
Switzerland	0.493	0.420	0.539	0.545	0.329	0.522	0.740	0.446	0.300	0.223	0.202	0.651	0.583	0.313	0.475		
United Kingdom	0.591	0.222	0.491	0.680	0.356	0.493	0.408	0.541	0.428	0.337	0.287	0.667	0.540	0.411	0.478	0.515	
United States	0.550	0.247	0.416	0.775	0.471	0.457	0.441	0.432	0.378	0.341	0.268	0.692	0.530	0.372	0.503	0.584	0.626

correlations shown in Table 2 are very similar to those found in other studies. thus Table 2 is very representative of typical correlation coefficients.

Table 3: Risk (standard deviation) for Swiss Investors 1980-1988.

Stocks	Domestic Risk	Exchange Risk	Total Risk
Australia	27.19	15.05	32.34
Austria	19.65	5.53	20.69
Belgium	20.18	8.47	20.85
Canada	21.02	12.73	25.55
Denmark	19.35	5.81	19.99
France	21.61	6.54	22.87
Germany	19.77	6.29	20.88
Hong Kong	36.70	12.97	41.35
Italy	29.46	6.60	30.65
Japan	17.47	11.51	21.72
Mexico	48.07	39.41	62.26
Netherlands	20.37	5.23	20.83
Norway	28.43	8.17	29.62
Spain	23.41	8.59	25.29
Sweden	24.19	9.63	25.32
Switzerland	16.39	0.00	16.39
United Kingdom	20.47	11.57	23.54
United States	17.30	13.94	21.70

Risk depends not only on correlation coefficients but also on the standard deviation of return. Table 3 shows the standard deviation of return for an investment in the common equity indexes. It should be emphasized once again that the standard deviation is calculated on market indexes and is therefore a measure of risk for a well diversified portfolio consisting only of securities traded within the country under examination.

As shown in the last section, there are two sources of risks. Risk caused by return variations in the foreign securities home market and risk caused by exchange gains and losses.

The column headed domestic risk shows the standard deviation of return when returns are calculated in the indexes' own currency. Thus the standard deviation of 19.77 for Germany is the standard deviation when returns on German stocks are calculated in marks. The second source of risk is exchange risk. Exchange risk comes about because the exchange rate between the mark and Swiss franc changes over time, affecting the return to a Swiss investor on an investment in German securities. The variability of the exchange rate for each currency converted to Swiss francs is shown in the column titled exchange risk. As discussed in the last section, the exchange risk and the within country risk are relatively inde-

pendent and standard deviations are not additive. Thus total risk to the Swiss investor is much less then the sum of exchange risk and within country risk. for example the standard deviation of German stocks in marks is 19.77%. The standard deviation of changes in the mark Swiss franc exchange rate is 6.29%. however the risk of German stocks in Swiss francs when both fluctuations are taken into account is 20.88%. It should be emphasized that the variability of exchange rates is calculated by examining the variability of each currency in Swiss francs. thus the total risk is measured from a Swiss investor's point of view.

As shown in Table 3 over the 1980-1988 time period the standard deviation of an index of the Swiss equity market was lower than the standard deviation of any of the other market indexes when each market was stated in its own currency. When the effect of exchange risk is taken into account, the low risk of Swiss investments for the Swiss investor is even lower. However, this does not mean that international diversification is without benefit. Given the low correlation between Swiss markets and other equity markets, a combination of Swiss securities and foreign securities is likely to be less risky than holding Swiss securities by themselves. As an example of this, Table 4 shows the combination of a value weighted index of world markets and the corresponding Swiss index. The numbers in the Table are standard deviations of this combination when various percentages are invested in the international portfolio. the minimum risk is achieved with 60% in the Swiss portfolio and 40% in the market weighted world portfolio (including Swiss securities). While the reduction in risk might seem small from putting 40% in the world portfolio keep in mind that the return on the world portfolio was over 16% while the return to the Swiss investor was just over 9%. Thus this decrease in risk was accompanied by an increase in return from a level of 9% to all level of over 11.8%. We will have more to say about returns in the next section of this paper.

These results were derived using data from 1980-1988. An interesting question to analyze is whether the results are unique to the period examined or if we can safely generalize them. The conclusions depend on the correlation between the world portfolio and the Swiss index and the standard deviation of each index. The correlations and standard deviations used in this analysis are very similar to the correlations and standard deviations used in this analysis are very similar to the correlations and standard deviations other researchers have found in other periods and for other currencies. thus the risk reduction shown in Table 4 would hold if data from other periods were used and the results are likely to be robust across periods. furthermore, rather substantial errors in selecting the optimal mix could be made and risk would still be reduced. Therefore, using data from a prior period to decide on a mixture of an international and domestic portfolio would likely result in a less risky portfolio than pure domestic investment.

Table 4: Risk from Placing *X* Percent in a World Index (including Swiss securities) and the Rest in the Swiss Index (value weighted index).

X Proportion in World Index	Standard Deviation
0	16.39
10	15.86
20	15.47
30	15.20
40	15.08
50	15.10
60	15.26
70	15.51
80	16.06
90	16.56
100	17.23

4. Returns from International Diversification

Table 5 shows the average annual returns from January 1980 to December 1988 on several international markets. The column labeled exchange gain is the difference between the return in the assets home country and the assets return to the Swiss investor [3]. The average non Swiss equity index had a return

of 23.08% in its home country compared to 9.34% for the Swiss market. With an exchange gain averaging -6.59%, when converted to Swiss francs the average non Swiss equity index returned 16.49%. Examining the column in Table 5 that presents returns in francs shows only 1 country had a return below Switzerland and 16 had higher returns. Thus almost any internationally diversified equity portfolio would have had a higher return than the Swiss market index over this period. During this period international diversification had the advantage of higher returns as well as lower risk.

For portfolio decisions, estimates of future values of mean return, standard deviation and correlation coefficients are needed. The correlation coefficients between international markets have been very low historically relative to intra-country correlations. As Europe integrates its markets and as all countries move toward greater integration, these coefficients are likely to rise [4]. However, they are still likely to be low relative to intra-country correlation. For example, the correlation coefficient between countries whose economies are relatively highly integrated such as Canada and the U.S., the Benelux countries or the Scandinavian countries is still much lower than the intra-country correlation coefficients. Thus international diversification is likely to continue to lead to risk reduction in the foreseeable future. However, we know of no economic reason to argue that returns will be higher or lower internationally.

Table 5: Return to Swiss Investors 1980-1988 (percent per annum).

Stocks	Own Country	Effect of Exchange Gain or Loss	To Swiss Investor
Australia	20.97	-6.82	14.15
Austria	10.80	-1.17	9.63
Belgium	23.93	-4.39	19.54
Canada	12.46	-2.96	9.50
Denmark	17.91	-4.38	13.53
France	19.39	-6.13	13.26
Germany	12.56	-0.11	12.45
Hong Kong	24.86	-6.43	18.43
Italy	30.98	-7.10	23.88
Japan	20.66	+6.63	27.29
Mexico	63.81	-51.43	12.38
Netherlands	19.92	-1.25	18.67
Norway	13.12	-5.32	7.80
Spain	29.80	-8.21	21.59
Sweden	31.43	-6.84	24.59
Switzerland	9.34	0.00	9.34
United Kingdom	23.57	-4.32	19.25
United States	16.12	-1.79	14.33

5. The Effect of Exchange Risk

In the first section we showed how the return on a foreign investment could be split into the return in the security's home market and the return from changes in exchange rates. In each of the prior tables we separated out the effect of changes in the exchange risk calculated the effect of converting all currencies into Swiss francs. obviously if we were presenting the same Tables from a Spanish or Norwegian point of view, the expected return and risk columns would be different since they would contain results as if all currencies were converted to Pesetas (for the Spanish person) or Kroner (for the Norwegian). Since Pesetas and Kroner have not fluctuated perfectly with Swiss francs, these columns would be different. Thus the country of domicile affects the expected returns and risk (including correlation coefficients) from international diversification.

Table 6 illustrates this by computing expected return and risk from the U.S. investor's point of view, and from the French point of view. The numbers are clearly quite different. It is possible to protect partially against exchange rate fluctuations. An investor can enter into a contract for future delivery of a currency. For example, a Swiss investor purchasing U.S. securities could simultaneously agree to convert dollars into Swiss francs at a future date and at the end of the period, the investor would be completely protected against exchange rate fluctuations by agreeing to switch an amount of dollars exactly equal to the value of the investment. However, given that, in general, the end of period value of the

Table 6: Return and Risk (variance) for U.S. Investors.

	Mean Return		Variance	
	in Francs	in Dollars	in Francs	in Dollars
Australia	19.3	16.4	32.2	31.4
Austria	15.7	12.8	20.3	23.0
Belgium	25.9	23.0	21.5	24.2
Canada	14.6	11.7	24.8	23.5
Denmark	19.3	16.4	20.1	20.9
France	19.5	16.6	21.5	25.3
Germany	18.5	15.6	20.8	23.0
Hong Kong	23.1	20.2	40.8	39.3
Italy	29.2	26.3	29.5	29.5
Japan	33.2	30.3	22.0	22.8
Mexico	16.5	13.6	62.2	60.3
Netherlands	23.8	20.9	21.0	21.3
Norway	13.6	10.7	29.2	30.4
Sweden	30.0	27.1	25.7	24.7
Switzerland	15.6	12.7	17.2	20.3
United Kingdom	24.8	21.9	23.1	23.6
United States	19.0	16.1	21.0	17.3

investment is random, (e.g. its expected value) the best the investor can do is to protect against a particular outcome [5].

As shown earlier, the standard deviation of foreign investments is increased as a result of exchange risk. If exchange risk was completed hedged then the column entitled Domestic risk in Table 3 would be the relevant column to use to measure risk. In all cases, entries in the domestic column are substantially less than the column titled total risk. While we will not present the Tables, the correlation coefficients are similar whether we calculate the correlation between returns assuming exchange risk is fully hedged away or we include exchange risk. Thus risk in international portfolios is considerably reduced if exchange risk is hedged away. The effect on expected return is less clear. Examining Table 5 shows that over the 1980-1988 period exchange movements caused losses to Swiss investors for most countries. However, the loss to the Swiss investor is the gain to the foreign investor, investing in Switzerland. Therefore, a different Table would hold if we expressed returns in, for example, U.S. dollars. Thus the effect on expected return of eliminating exchange gains or losses varies from country to country and period to period.

One way of analyzing whether international diversification will be a useful strategy in the future is to analyze how low returns would have to be in foreign countries for an investor not to gain via international diversification.

6. Return Expectations and Portfolio Performance

Most of the literature on domestic and international diversification tells us that history is a much better guide in forecasting risk than it is in forecasting returns. If we accept the historical data on risk as indicative of the future for any assumed return on the Swiss market, we can solve for the minimum return that must be offered by any foreign market to make it an attractive investment from the Swiss standpoint.

We did this under two assumptions: that the Swiss market would return 9% and that it would return 12%. These numbers were selected because 9% is approximately the return for the Swiss equity market in the 80's and 12% is roughly the historical long term return for many markets. The calculations used the correlation coefficients shown in Table 2 and the standard deviations shown in Table 3 and a risk free rate of 6%. These numbers are shown in Table 7. The basic formula to determine these numbers is as follows:

Hold Non Swiss Securities as long as

$$\frac{\bar{R}_N - R_F}{\sigma_N} > \frac{\bar{R}_S - R_F}{\sigma_S} \rho_{N,S}$$

Where

$\bar{R}_N$ is the expected return on the non Swiss securities.

$\bar{R}_S$ is the expected return on Swiss securities.

σ_N is the standard deviation of the non Swiss securities.

σ_S is the standard deviation of Swiss securities.
$\rho_{N,S}$ is the correlation between Swiss securities and non Swiss securities.
R_F is the risk free rate of interest.

While this equation is written from a Swiss investor's point of view a similar equation holds for investors in any country considering foreign investment. The reader would simply redefine the symbols presently subscripted S to the country of interest. While this equation is derived from the first order condition it has an economically plausible interpretation [6]. The idea of buying into a foreign market when it's excess return to risk is higher than the excess return to risk of the domestic market is intuitively appealing. But since only part of the risk must be borne (can't be diversified away) this criteria is two stringent. The required return on the foreign market must be lowered by the condition coefficient to adjust for the fact that the Swiss investor only bears part of the risk.

Note in Table 7 that the return required on a foreign investment is for all markets considerably less than the return on the Swiss investment. For an assumed Swiss expected return of 9%, Austrian securities would have to have an expected return of less than 7.59% for it not to pay to invest in Austrian securities at all. For the Swiss investor diversification will pay as long as the investor expected return in a foreign market is no less than the expected return in the Swiss market.

If we rearrange the expression (1) we have the following rule:

Hold foreign securities as long as

$$\bar{R}_N - R_F > [\bar{R}_S - R_F] \left[\frac{\sigma_N \rho_{N,S}}{\sigma_S}\right]$$

As long as the expression in the last bracket is less than one, foreign securities should be held even with lower expected returns than those found in the domestic market. for all the countries examined, except Hong Kong and Norway, the expression in the brackets was less than one so that the expected return on non Swiss securities could be less than Swiss securities and international diversification would still pay. Thus for the period studies expected returns in non Swiss countries could have been considerably less than in Swiss countries and international diversification would still have payed.

Table 7: Minimum Returns on Foreign Markets Necessary for International Diversification to be Justified.

Swiss	9 %	12 %
Australia	8.92	11.84
Austria	7.59	9.18
Belgium	8.06	10.11
Canada	8.54	11.10
Denmark	7.20	8.41
France	8.19	10.37
Germany	8.28	11.66
Hong Kong	9.38	12.75
Italy	7.68	9.37
Japan	6.89	7.77
Mexico	8.31	10.60
Netherlands	8.48	10.96
Norway	9.16	12.32
Spain	7.45	8.90
Sweden	8.20	10.40
United Kingdom	8.20	10.44
United States	8.32	10.64
Value Weighted Index	7.93	9.87

All entries in Table 7 except those in the last row showed the minimum expected return when one country was added to the Swiss portfolio. thus the portfolio was composed of two countries' securities. The last row shows the expected return on a value weighted index necessary to justify adding it to Swiss securities. While not the lowest return, it is less than most countries' return considered separately. If the expected return on Swiss securities is 9%, a value weighted portfolio should be added if its expected return is greater than 7.93%. This is a general result. Portfolios of securities from many countries will be less risky than portfolios of a single country's securities. Examining equation 2 shows that for a given correlation the lower the standard deviation the lower the expected return on a foreign

portfolio can be and still have international diversification pay.

We argued in the first section that international diversification lowers risk. In this section we have shown that returns in foreign markets would have to be much lower than returns in the domestic market or international diversification pays. However, what is foreign to one investor is domestic to another. Are there any circumstances where international diversification does not pay for investors of every country?

To understand this issue, consider the Swiss and U.K. markets and refer to Table 7. This table shows that if the return in the U.K. market is not less than 8.2% when returns in the Swiss market are 9%, a Swiss investor should purchase some U.K. securities. Furthermore it is easy to show that if a U.K. investor believed expected returns in the U.K. would be less than in Swiss, then the U.K. investor should purchase Swiss stocks. If investors in the two markets agree on expected returns, we have one of three situations: both gain from diversification, the Swiss investor gains, or the U.K. investor gains. However, in all three cases at least one investor should diversify internationally. If the investors do not agree on returns in the markets, then it is possible that neither the Swiss investor nor the U.K. investor will benefit from international diversification. For example, assume Swiss investors believed U.K. markets have an expected return of 5% while Swiss markets would have an expected return of 10%. Further assume U.K. investors believe U.K. markets have an expected return of 10% while Swiss markets have an expected return of 5%. Under this set of expected returns neither Swiss nor U.K. investors would wish to diversify internationally. Are there any circumstances where investors in all countries could rationally believe that returns are higher in their country relative to the rest of the world. The answer is yes. If governments tax foreign investments at very different rates from domestic investments, then the pattern just discussed would be possible for after tax returns. Differential taxation has occurred in the past, continues to occur today, and will likely persist into the future [7]. Second, many countries impose a withholding tax on dividends. Taxable investors may receive a domestic credit for the foreign tax withheld and thus not have returns lowered. However for non-taxable investors (or for a non taxable part of an investor's portfolio such as pension assets) the withholding is a cost that lowers the return of foreign investment. A third situation that could cause foreign investments to have a lower return than domestic investments for all investors is if there were differential transaction costs for domestic and foreign purchases. This could occur if there was difficulty in purchasing foreign securities or currency controls existed. For example, there may be restrictions in converting domestic to foreign currency that could affect returns. The exchange of currency A for B might take place at an official rate higher than the free market rate and there might be an expectation of a later reversal. A fourth influence that can result in investors in all countries having an expectation of higher returns from domestic investments relative to foreign is a danger of governments restricting the ability of foreigners to withdraw fund. Governments can and do place such restrictions on foreigners. This can reduce returns to foreigners. The considerations just discussed are real and can affect the returns from international diversification. Before leaving this section, one other issue needs to be discussed. It has been suggested that investors could confine themselves to a national market and get most of the benefits of international diversification by purchasing stocks in multinational corporation. JACQUILLAT and SOLNIK (1978) have tested this for the American investor. They find that stock prices of multinational firms do not seem to be affected by foreign factors and behave much like the stocks of domestic firms. The American investor cannot gain very much of the advantage of international diversification by investing in the securities of the multinational firm.

Conclusion

In this paper we have discussed the evidence in support of international diversification with special

emphasis placed on implications for the Swiss investor. The evidence that international diversification reduces risk is uniform and extensive. Given the low risk, international diversification is justified even if expected returns are less internationally than domestically. Unless there are mechanisms such as taxes or currency restrictions that substantially reduce the return on foreign investment relative to domestic investment, international diversification has to be profitable for investors of some countries and possibly all.

Footnotes

[1] Japan has a large number of companies with substantial equity holdings of other companies. The effect of companies having a portion of their assets invested in stock of other companies is to overstate the market values of the assets since the same assets are valued in the company that owns them and in companies that own its shares. Estimates of Japanese cross holdings are between 50% and 60%. This is much greater than for other countries. Thus these tables very much overstate the value of the Japanese assets. European countries are the next largest in cross holdings. Thus European values are somewhat overstated though not nearly to the extent of Japan.

[2] Foreign currency exchange rates can be quoted in two ways. If an exchange rate is stated as the amount of francs per unit of foreign currency the exchange rate is quoted in direct (or Swiss) terms. If the exchange rate is given as the amount of foreign currency per franc, the quote is in indirect (or foreign) terms. The form of quotes differs across markets. In the interbank market indirect quotes are used while in futures and options markets direct quotes are the norm

[3] From section 2, the expected return to a Swiss investor is not the sum of exchange gains and losses and the return in the investor's home country. Thus column two is not the exchange return.

[4] In particular, exchange rates between European currencies will be fixed. However, note that they are fixed within narrow limits currently so that the change will not be very much.

[5] Procedures exist for changing the hedge through time in order to eliminate most of the exchange risk. See KAPLANIS and SCHAEFER.

[6] To optimize any portfolio problem one can take the derivative of the ratio of excess return to standard deviation with respect to the fraction invested in each security. This leads to the well known first order conditions:

$$\bar{R}_N - R_F = Z_N \sigma^2_N + Z_S \rho_{NS}\, \sigma_S \sigma_N$$

$$\bar{R}_S - R_F = Z_N \rho_{NS}\, \sigma_S \sigma_N + Z_S \sigma^2_S$$

where Z's are proportional to the fraction invested in each market.

Setting Z_N equal to zero and elimination Z_S results in the above equation as an equality. Increasing $\bar{R}_N$ would cause Z_N to be greater than zero. For a more detailed derivation see ELTON GRUBER/RENTZLER (1987).

[7] A government's ability to enforce the payment of taxes may be lower on foreign than domestic securities. Tax cheating could mitigate tax rate differentials.

References

ELTON, E.J, M.J. GRUBER and J. RENTZLER (1987): "Professionally Managed, Publicity Traded Commodity Funds", Journal of Business 60, No.2, April, pp. 175-199.

JACQUILLAT, B. and B. SOLNIK (1978): "Multi-Nationals Are Poor Tools for Diversification", Journal of Portfolio Management, Winter, pp. 8-12.

KAPLANIS and SCHAEFER: "Exchange Risk and International Diversification in Bond and Equity Portfolios", unpublished manuscript, London Business School.