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INTERNATIONAL DIVERSIFICATION AND THE EMERGING MARKETS

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The models of portfolio selection developed by Harry Markowitz and James Tobin provide normative rules for the diversification of risky assets. These models have been extended and empirically tested after their first presentation; later, international diversification has been added to them. Both institutional and individual investors are increasingly attempting to diversify risk by spreading their portfolios across different national stock markets. This article reviews the argument for international investment, discusses the risk reduction effect of correlations between securities and concludes that emerging markets have an important role to play for asset allocation.

The case for international investment

Since an integrated international capital market has not yet been fully built, international diversification helps to improve the risk-adjusted performance of a domestic portfolio. On the other hand, one can observe more similarity in capital market behavior if there are closer economic and politic policies between the countries as in the members of E.U. countries or the United States and Canada[1] . The coveriation between markets, however, is still far from unity, leaving ample opportunities for risk diversification[2] .

Drummen and Zimmermann (1992) analysed in their recent survey the daily local currency returns on 105 stocks from 11 European countries over the 1986-89 period. Their findings may be surprising, given the degree of European economic and financial integration and the internationalization of stock trading in Europe. The result of their survey indicates that risk reduction on the order of magnitude of 19 % can be achieved by diversifying across European markets. This means that, notwithstanding the economic integration in Europe, one can still achieve risk reduction in his portfolio through diversification among EU countries. Of course, significant advances in the integration process will eventually lead to changes in the behavior of investors.

International investment in equities differs from domestic investment in equities in three important aspects[3]

1) Since the national factors effects the securty returns within the domestic markets, the covariances among equities are much higher than the covariances among equities in different markets.

2) Taxation, currency controls and even investor tradition may segment financial domestic markets, so that equities are priced in a domestic context.

3) Foreign Exchange Risk is involved only in the international investment.

International diversification has been an older tradition in Europe than in the USA and Japan e.g. the majority of the European mutual funds are internationally diversified[4] . They may even specialize in holding stocks of specific countries (e.g. USA or Japan). It is therefore fairly easy for most Europeans to hold a well diversified portfolio. The same is getting true for the USA and Japan as well as for some newly emerging markets. International diversification literature after 1950's uses some data from foreign stock markets to make the point that American investors should hold foreign stocks to reduce the variance of a portfolio of domestic stocks without reducing its expected return[5] .

What are the main objectives that make the international invesments feasible despite currency risks. One decade ago, most investors would have found that investing in less devel-

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[1] Since the level of interdependencies and activities between international financial markets have increased, it is easy to believe that financial markets have become more volatile and highly integrated in recent years. But this does not necessarily imply high(statistical) correlations between markets.

[2] For a detailed discussion See, Solnik, Bruno(1989)

[3] See, Lessard, Donald R.(1976)

[4] See, McDonald (1973).

[5] See, Grubel (1968), Levy and Sarnat (1970), Lessard (1970) Adler & Dumas 1983, Solnik (1974)(1988), Bailey & Stulz (1990)

oped markets was too risky[6] . Today, most of the investors think that investing at emerging markets looks very much as investing in USA, the UK, Japan, Germany did a decade ago. Three reasons can be identified for investing in those countries[7] . Firstly, the international investor experiences only a small part of the often enourmous volatility confronting the purely local investor. Table I. shows five year US dollar monthly return of the IFC index of emerging and some developed markets. One can easily see that, for instance, Polish stock exchange market has annulized mean of 267.72 and standard deviation of 104.82 as an extreme example, meanwhile US S&P500 has 14.40 annualized mean and 13.03 standard deviation. This is a clear proof of higher risk and return on an emerging market. Secondly, emerging markets are attractive to investors becouse the different participants gradually come to the market. New stock markets participants are usually passive investors and begin with little trading. When the market starts being developed professional investors enter to the market and try to use fundamental information before others use it. As the market becomes fully developed the amateurs join to the market since they simply amplify existing price trends, on this stage a value-oriented investor can enjoy, superior income. Thirdly, the emerging markets are imperfectly integrated with the world capital markets, so that if the investor can foresee the real potential growth of that particular market, he can realize better return than the other investors.

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[6] Emerging markets are usually considered to be too risky becouse of their association with higher political risk and currency risk. Political risk includes uncertainties on the capital flows and exchange controls, imposition of taxes, the risk of expropriation, political instability, etc. Errunza and Losq(1987) discussed in their work that these perceptions do not apply to all emerging markets.

[7] See, Wilcox, Jarrod W. , (1992).

Table I
Statistics of the IFCG Total Return Indexes
(US$; December 1988-December 1993)

Market	*Number of months*	*Mean of % change*	*Standard deviation*	*Annualized mean*	*Annualized standard deviation*	*Correlation with S&P500*
Latin Amerika						
Argentina	60	8.26	33.63	99.12	116.50	0.06
Brazil	60	4.05	21.92	48.60	75.93	0.20
Chile	60	3.45	7.46	41.40	25.84	0.16
Colombia	60	4.12	10.76	49.44	37.27	0.09
Mexico	60	3.91	7.76	46.92	26.88	0.33
Peru	12	3.42	12.76	41.04	44.20	0.53
Venezuela	60	3.17	14.68	38.04	50.85	0.08
East Asia						
China	12	1.15	19.81	13.80	68.62	0.69
Korea	60	0.06	8.52	0.72	29.51	0.19
Philippines	60	2.52	10.53	30.24	36.48	0.34
Taiwan, China	60	1.57	15.03	18.84	52.07	0.15
South Asia						
India	60	1.86	11.09	22.32	38.42	0.17
Indonesia	48	0.91	9.34	10.92	32.35	0.17
Malaysia	60	2.43	6.68	29.16	23.14	0.42
Pakistan	60	2.74	9.00	32.88	31.18	0.06
Sri Lanka	12	4.56	7.95	54.72	27.54	0.12
Thailand	60	3.27	9.31	39.24	32.25	0.31
Europe/Mideast/Africa						
Greece	60	2.46	14.01	29.52	48.53	0.03
Hungary	12	2.08	7.25	24.96	25.11	0.41
Jordan	60	1.18	5.72	14.16	19.81	0.22
Nigeria	60	1.21	11.89	14.52	41.19	0.11
Poland	12	22.31	30.26	267.72	104.82	0.21
Portugal	60	0.42	7.19	5.04	24.91	0.36

Market	*Number of months*	*Mean of % change*	*Standard deviation*	*Annualized mean*	*Annualized standard deviation*	*Correlation with S&P500*
Regions						
Composite	60	1.48	6.40	17.76	22.17	0.25
Latin America	60	3.24	8.90	38.88	30.83	0.25
Asia	60	1.19	7.61	14.28	26.36	0.18
Developed						
U.S., S&P500	60	1.20	3.76	14.40	13.03	1.00
MSCI, EAFE	60	0.36	5.91	4.32	2047	0.43
FT EuroPac	60	0.33	6.10	3.96	21.13	0.41

Source : IFC Emerging Stock Markets Factbook 1994

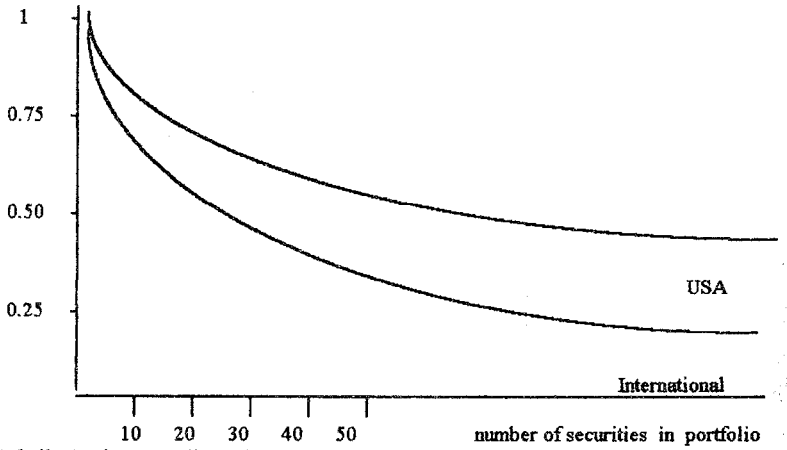
The correlation structure between foreign markets

Investors who want to allocate their investment portfolios so as to maximize the rates of return on their portfolios for a given risk, or to minimize the risk for a given rate of return, are interested to know the degree of correlation between foreign stock markets. The proportion of the investment risk that is diversifiable depends on the degree of correlation among the returns on these assets. Moreover, the extension of diversification across national boundaries allows the elimination to a certain extent of the risk that is systematic within each country. Solnik (1974) pointed out that, using 300 European stock and all

shares quoted on the New York stock Exchange, international diversification was attractive. He took randomly selected portfolios of different sizes, starting with single stocks and then calculated the variance of the portfolios. He confirmed that when the number of shares in a portfolio increased from one to ten its risk fell dramatically whereas more than ten stock made very small differences to the results. Figure 1 compares the risk reduction that can be obtained through diversification within the USA, to that obtainable through international diversification. In the latter case, portfolio risk drops to 33 percent of that of the national stock.

Figure 1

standard deviation of portfolio relative to standard deviation of typical stock.



Source : B.H. Solnik "Why not diversify internationally rather than domestically? The financial Analysts Journal (July-August 1974) pp.48-54.

The reason for this additional diversification is that returns on diversified single-country portfolios display considerable independence. Many of the factors effecting share values are essentially domestic in nature. Differences among nations in tax laws, monetary policies and general political climate influence the differences in stock returns between countries. Hence, the total risk of a portfolio will not only depend on the number of securities in a portfolio, but also on the degree of independency of each individual stock risk in terms of variability of returns. This can be seen by examining the correlations between returns on the stock markets of major countries. Table II. Shows the correlation coefficient matrix of IFC total return indexes for the major stock markets and most of the emerging stock markets.

Table II

	US S&P500	MSCI, EAFE	FT, EuroPac	IFCG Comp.	IFCG L. Amer	IFCG Asia	Argentina	Brazil	Chile	China	Colombia	Greece	Hungary	India	Indonezya	Jordan	Korea	Malaysia	Mexico	Nigeria	Pakistan	Peru	Philippines	Poland	Portugal	Sri Lanka	Taiwan	Thailand	Turkey	Venezuela	Zimbabwe
U.S. S&P500	1.00																														
MSCI,EAFE	0.43	1.00																													
FT,EuroPac	0.41	1.00	1.00																												
IFCG Comp.	0.25	0.30	0.30	1.00																											
IFCG L.Amer	0.25	0.19	0.18	0.51	1.00																										
IFCG Asia	0.18	0.27	0.28	0.96	0.28	1.00																									
Argentina	0.06	-0.11	-0.13	-0.06	0.00	-0.09	1.00																								
Brazil	0.20	0.18	0.16	0.36	0.84	0.14	-0.19	1.00																							
Chile	0.16	-0.14	-0.16	0.32	0.38	0.24	-0.03	0.23	1.00																						
China	-0.69	-0.06	-0.03	-0.21	-0.66	-0.07	-0.47	-0.23	-0.23	1.00																					
Colombia	0.09	0.06	0.05	0.13	0.09	0.11	-0.07	0.44	-0.12	-0.32	1.00																				
Greece	0.03	0.12	0.11	0.01	0.12	-0.05	0.10	0.19	0.05	0.41	0.17	1.00																			
Hungary	0.41	0.04	0.02	0.23	0.42	0.11	0.41	0.03	0.08	-0.29	0.67	0.19	1.00																		
India	-0.17	-0.22	-0.23	0.02	0.11	-0.02	0.17	0.12	0.12	-0.01	-0.01	0.06	0.59	1.00																	
Indonezya	0.17	0.06	0.06	0.43	0.05	0.41	-0.19	0.10	0.16	-0.25	0.24	0.32	0.50	0.11	1.00																
Jordan	0.22	0.24	0.24	0.16	-0.16	0.21	-0.12	-0.09	0.00	-0.28	0.04	0.09	-0.15	-0.11	0.08	1.00															
Korea	0.19	0.31	0.32	0.41	0.05	0.47	-0.13	-0.33	-0.05	-0.19	-0.07	-0.22	-0.23	-0.14	0.02	0.01	1.00														
Malaysia	0.42	0.51	0.50	0.59	0.27	0.59	-0.19	0.12	0.11	0.01	0.18	-0.01	0.32	0.02	0.49	0.18	0.31	1.00													
Mexico	0.33	0.18	0.17	0.44	0.45	0.36	0.35	0.08	0.08	-0.47	-0.02	-0.04	0.32	0.04	0.11	-0.02	0.27	0.42	1.00												
Nigeria	-0.11	0.17	0.18	-0.10	-0.06	-0.08	0.06	-0.11	-0.18	0.44	0.08	0.08	-0.18	-0.19	-0.09	0.47	0.14	0.08	-0.01	1.00											
Pakistan	0.16	0.01	0.00	-0.14	0.05	0.15	0.05	-0.03	0.04	-0.37	0.43	-0.10	0.00	-0.03	0.13	0.10	0.08	0.11	0.04	-0.04	1.00										
Peru	0.53	0.44	0.38	0.49	0.61	0.39	0.74	0.05	0.17	-0.62	0.31	-0.02	0.46	-0.14	0.34	0.04	-0.05	0.36	0.51	-0.35	0.31	1.00									
Philippines	0.34	0.33	0.31	0.50	0.24	0.50	-0.01	0.20	0.17	0.10	0.30	0.22	0.06	-0.06	0.52	0.23	-0.08	0.56	0.19	-0.02	0.22	0.37	1.00								
Poland	0.21	0.35	0.38	0.03	-0.07	0.08	-0.03	-0.14	-0.20	-0.30	0.54	0.07	0.24	0.36	0.38	0.24	0.20	0.35	-0.01	0.11	0.05	-0.07	-0.08	1.00							
Portugal	0.36	0.55	0.54	0.20	0.21	0.11	0.13	0.25	0.09	-0.02	0.04	0.44	0.56	0.09	0.37	-0.05	0.02	0.27	-0.03	-0.05	0.06	0.12	0.36	0.53	1.00						
Sri Lanka	-0.12	-0.45	-0.44	0.20	0.48	0.11	-0.02	0.11	0.08	-0.34	0.32	-0.07	0.33	0.53	-0.05	-0.32	0.05	0.05	0.50	-0.22	0.38	0.44	0.05	-0.33	-0.08	1.00					
Taiwan	0.15	0.24	0.24	0.86	0.24	0.91	-0.06	0.14	0.23	-0.03	0.11	0.00	-0.10	-0.17	0.38	0.20	0.24	0.42	0.30	-0.16	0.12	0.38	0.48	0.07	-0.09	-0.06	1.00				
Thailand	0.37	0.27	0.25	0.41	0.12	0.44	0.07	0.01	0.19	0.01	0.15	0.16	0.10	0.17	0.39	0.17	0.18	0.64	0.29	-0.01	0.22	0.36	0.53	0.17	-0.10	0.19	0.28	1.00			
Turkey	-0.19	0.06	0.05	0.23	0.07	0.20	0.17	0.16	-0.11	0.44	0.08	0.39	-0.10	0.10	0.31	-0.09	-0.05	0.17	-0.11	0.21	0.03	-0.15	0.03	0.30	-0.22	-0.37	0.47	0.19	1.00		
Venezuela	-0.08	-0.12	-0.12	-0.29	-0.20	-0.26	0.06	-0.19	-0.20	-0.07	0.18	0.02	-0.04	0.08	-0.06	-0.10	-0.05	-0.19	-0.11	0.18	0.04	0.12	-0.14	-0.42	0.28	0.15	-0.20	-0.16	-0.11	1.00	
Zimbabwe	0.03	0.17	0.18	0.05	0.09	0.04	-0.10	0.05	-0.03	-0.12	-0.06	0.08	0.77	-0.12	0.23	0.11	-0.06	0.28	0.08	0.08	-0.02	0.51	0.14	0.15	0.14	0.42	0.06	0.07	0.05	0.16	1.00

US S&P500	MSCI, EAFE	FT, EURO.	IFCG AMERİCA	IFCG ASİA	ARG. COMP.	BRA. LATİN	CHİLE	CHİNA	COLOM.	GREECE	HUN.	INDİA	INDON.	JORDAN	KOREA	MALA.	MEX.	NİGER.	PAK.	PERU	PHİL.	POL.	PORT.	SRİ	TAİW.	THİAL.	TURKEY	VENEZ.	ZİMBAB.

Source : IFC Emerging Stock Markets Factbook 1994.

The benefit from the international equity investment will be determined by the degree of correlations of the national stock markets with respect to the world market. Hunter & Coggin (1990) found in their research that the international diversification could have reduced investment risk (defined by variance of return) to about 56 %. Eaker and Grant (1990) in their research for the period of 1975-1988 showed that even if the diversification is not optimal, it is beneficial to allocate the sources into foreign equities. The gain is even larger when the proportion of the foreign securities is higher in the total portfolio. They calculated that when the portfolio constructed 60 % with foreign equities the average return increased 232 basis points and the standard deviation decreased 182 basis point. It is noticeable that the potential benefits of diversification are very large.

Spiedell and Sappenfield (1992) discussed in their article that correlations among developed markets have been rising due to simultaneous decisions of investors. We have seen this simultaneous behavior in the OPEC oil embargo of 1973[8] ,international crash of October 1987[9] and the Iraqi invasion of Kuwait 1990. As the diversification across developed markets is reduced, spiedell and Sappenfield argues that emerging equity markets become increasingly important for international diversification.

The gain from diversification

The simplest way to measure the benefit of international diversification is to estimate how much international diversification can reduce the variance of a portfolio without changing its mean. The extent to which the variance can be reduced depends on the variance of the foreign indices, and their correlation with the local index, and on their mean returns.

Assume that the expected return in two countries is the same, being $E(R_1)=E(R_2)=12$ %, the variance of expected returns in this two countries is also the same, being $\sigma_1^2 = \sigma_2^2 =$ 20% Furthermore assume that investment proportion in each country's assets is the same ($x = 1 - x = 50\%$).

The expected return of such portfolio will be

$$E(Rp) = x \,.\, E(R_1) + (1 - x)\, E(R_2)$$
$$= (0.50) \,.\, (0.12) + (0.50).(0.12) = 12\%$$

On the other hand the variance of such portfolio will depend on the correlation between these two countries assets.

[8] Hilliard, J. (1979) reported strong correlations among intra-continental regional indices, but low interregional correlation during the period of July 1973 to April 1974.

[9] Roll, R.(1989), in his research showed that the stock markets examined moves in the same direction in October 1987. This was the only month during the 1980s that the stock markets moved simultaneously.

$$Var(Rp) = x^2 Var(r_1) + (1 - x)^2 Var(r_2) + 2x(1 - x)\sigma_1 \sigma_2 . \rho_{12}$$
$$= 0.50\ (0.20) + 0.50^2\ (0.20) + 2\ (0.50)\ (0.50) \sqrt{20} . \sqrt{20} . \rho_{12}$$
$$= 0.05 + 0.05 + 0.10\ \rho_{12}$$
$$= 0.10 + 0.10\ \rho_{12}$$

If the correlation is	+ 1	Var (rp) will be	0.20
"	+ 0.50	"	0.15
"	0	"	0.10
"	- 0.50	"	0.05
"	- 1	"	0

The calculations above illustrate the risk-reduction benefits available to the international diversified portfolios since the correlation between the countries' rates of returns varies.

Conclusion

Following the liberalization of capital flows and deregulation of financial markets in recent years international investors had alternative options for a better asset allocation. In this article the features of international diversification in a mean-variance framework have been highlighted. It is well-known that an investor can benefit from diversification of investments through the reduction of total portfolio risk without experiencing a decrease in the exepected return, or through the increase in the expected return without having to take any additional risk. Lowering the risk in an internationally diversified portfolio depends on the degree to which national markets are interdependent. There would be no benefit from international diversification if all cross-national correlations were one. If all cross-national correlations were zero, implying that all national markets are fully independent, then international diversification would completely eliminate the effect of variation in national markets. On the other hand, if markets are segmented, implying that market movements are less than perfectly correlated an investor's potential gain from international deiversification will be greater.

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