

# **CHAPTER-V**

## **'No-integration' – Benefits from International Diversification**

## 5.1 INTRODUCTION

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There is a clear consensus among financial economists that return correlation among assets is the single most important factor to reduce risk for a given level of returns that make up the portfolio. Low as opposed to high correlation among international markets suggest agenda of globalization yet to be completed and still any artful portfolio manager can enjoy the benefit of risk reduction by investing abroad. But this benefit is only achievable against higher transaction cost, tax, cost of collecting information and numerous other cost finally it is truly a formidable task to assess 'net benefit' of international diversification.

In many organizations, equity investing started as a domestic only affair with institutional investors investing in securities and companies that they 'knew'. Given the domestic focus of many investors' that is widely known as 'home-bias', fascination to invest in the local market is not surprising. Even then risk reduction with bias for local market is possible if most of the revenue of domestic companies flow from foreign countries (Ruben, 2009) or a number of foreign companies enlist shares in the local market. It is truly possible in developed economy such as US, UK, Japan, Canada etc. where 'invest locally-enjoy benefit of global economy' to an extent achievable. The benefits of course largely absent in the emerging markets those are in fact comparatively less integrated and ill developed. Poor 'quality' of functioning, unfavourable regulatory environment, informational inefficiency, high transaction cost debar its investors to enjoy the benefit of international diversification relying simply on domestic market. So 'invest abroad', 'allow foreign portfolio investment', 'enjoy benefits of diversification' are the contemporary slogan of globalized economy. Hence the question is not whether to invest in Japan or in British market; the relevant point is whether to invest in an internationally diversified portfolio or in a purely domestic market.

Declaration 'invest abroad' though appears sound and simple but a number of crucial decisions to be taken carefully before responding to the current fashion – 'go beyond the boundaries'. Goal of risk reduction is undeniably important and rightly emphasized by financial economist. But neither it is possible to invest in all the

available countries nor is it desirable too. It involves huge transaction cost, administrative expenditure or even it may be unmanageable. 'Quality of the market' along with pattern of co movement of earnings to be taken care of ignoring 'picks and choose policy'. Financial economists of course find more interest to study - Should we construct simply debt or equity portfolio? If it is a combination of two, what should be the optimal mix? Should we follow passive or active portfolio strategy? What are the implications of country restriction on portfolio mix and performance? Country or industry sector which one is important? How to select benchmark portfolio? 'To hedge or not to hedge' what strategy to be followed? Is it conditional or unconditional correlation which one is appropriate while measuring risk? How to manage currency risk? Financial economics are largely geared to meet above problems that disturb asset managers while investing abroad. The intensity of the problems have perpetuated currently when increased percentage of households savings invested in capital market and there is a growing trend of cross border flow. Of course, all the problems are not equally important across countries or region- currency risk is nearly irrelevant in Euro countries, in developed economy investors enjoy more freedom regarding asset mix, alternatively concept of optimal portfolio is nearly unachievable in many emerging economies due to enormous restrictions.

Present thesis mainly attempts to answer two contemporary issues of international portfolio diversification that are closely related to present trend of integration. Virtually, there are two main sources of risk reduction, first, nature of correlation among assets, second increased number of investible foreign asset markets that widens the scope of diversification. While correlation and risk reduction is widely discussed in the literature of financial economics, widening of scope and its impact on performance of international portfolio is mostly ignored. As the present movement for internationalization is mainly restricted to some developed economy thus there is wide scope of investing in relatively unexplored economy to enjoy benefit of diversification. Firstly we attempted to measure benefit of widening scope of investing in the new era. Secondly, we tried to how risk-return relationship in the changing economic environment alters to suggest attractiveness of overseas investment. This will help investor to decide should we invest domestically,

regionally or globally. Of course, if all the investors hold the world market portfolio then only theoretically it would be possible to achieve global equilibrium.

We reiterate, that the scope of this section is to measure the benefit of international diversification with no ambition to predict risk, to decompose sources of risk, to assign weight age to each source of variance and to measure risk premium objectively (Pollet and Wilson, 2010). There are outstanding research works showing correlation changes and its impact on risk-return relationship of portfolio and these can only be ignored at the cost of huge error. Study of regime - switching model developed by Ang and Chen (2005) along with other notable researchers documented the impact of asymmetric correlations on equity portfolio (Butlar and Joaquin 2002, Longin and Solnik 2001, Arouri, M. 2004). In our case we simply tried to show benefit of investing beyond national boundaries at a point of time relying on widely used mean variance concept. Following earlier studies we followed passive instead of active strategy because it minimizes transaction cost and cost of rebalancing the portfolio [Solnik 1994, Solnik et. al 1996, Bartram and Dufey 2001, Arun A. Kumar 2008, Ruban and Melas 2009].

For an international investor, the return on any foreign asset varies partly due to asset specific risk and the rest stems from fluctuations in exchange rates. Though the importance of each component of risk varies, grossly total risk of international invest may be defined as the summation of asset specific risk and currency risk while the latter constitutes only 10% of total risk (Sohnke, Bartram and Dufey, 2001). There is good number of research that has dealt with currency risk elaborately with robust econometric tools and no serious study can ignore these findings [Bhattachrya and Mukherjee 2003, Nath and Samanta, 2003]. Similarly, a wide group of researchers most probably due to fuzzy relationship between stock and exchange market, trivial contribution of exchange risk in the total risk, insurmountable problem of management and cost involved preferred to ignore this component of risk (Odier and Solnik 1993, Froot 1993, Black 1989). We ignored currency risk as it is comparatively insignificant compared with market risk. In fact systematic currency hedging is very costly in the long run because of the transaction costs and

administrative burden of constantly monitoring and rebalancing the forward currency position [Solnik 1993].

There is a long standing debate-Is it country or industry effect that influences portfolio performance? [Jeffrey (2002) Baca et al (2000), Cavaglia et al (2004)] Should portfolio manager follow 'top down' or 'bottom up' approach as it is conveniently known in modern finance? In emerging markets study suggests country effect is more prominent than industry [Kumar 2008 Griffin and Stultz 2001]. Thus we considered country level diversification ignoring industry effect in the present study.

## 5.2 DIVERSIFICATION RATIO AND RISK REDUCTION: METHODOLOGICAL ISSUES

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Investors who prefer to invest only in domestic market virtually restrict themselves to a smaller number of securities to choose from. Since they exclude the large set of foreign stocks, bonds and other securities, they limit the power of diversification a priori and forgo the possibility of further reducing portfolio risk by picking some foreign stock that exhibit low correlation with domestic portfolio.

One of the most popular findings in financial economics is the decrease in portfolio risk that occurs with the sequential addition of stocks. Initially, the portfolio variance decreases rapidly as the number of investible country increases thereafter it reduces marginally. Statman (1987) concludes that most of the variance reduction can be achieved when the number of stocks in a portfolio reaches 30. Underlying assumption is that, while individual security variance matters for portfolio with few stocks, portfolio variance is primarily driven by the average covariance when the number of securities becomes large. The lower the covariance between securities, the smaller the variance of a diversified portfolio becomes, relative to the variance of the securities that make up the portfolio. The primary motive for international diversification has been to take advantage of the low correlation between stocks in different national markets. Solnik (1976), Goetzmann et. al. (2005) conclude that an internationally diversified portfolio enjoy a substantially reduced risk compared to the portfolio

invested domestically. This is the point that we attempt to elaborate in this section with due attention to Indian investors.

Unfortunately, the lack of individual stock return data for a period of nearly a decade restrains us from studying the benefits of international diversification at the company level. But given that these benefits are largely driven by the correlation across markets, a simple analogue can be constructed by comparing the variance of a portfolio of country indices relative to the variance of portfolios that invest only in a single country. This will help to understand incremental benefits of diversifying internationally rather than investing in a single domestic market.

Benefits of international diversification mainly stem from two main sources. The first is the average covariance -or correlation -between markets. A lower covariance rotates the diversification curve downwards. This is widely discussed, need little elaboration and we describe it as 'qualitative aspect' of risk reduction. Stock market variance may be defined as a product of correlation among markets  $\rho_t$  and individual market variance  $\sigma_t^2$ . The stock market portfolio  $s$  is the weighted portfolio of all stocks where  $w_j^t$  is the weight age defined as the fund invested in each country.

The variance of the portfolio return is given by:

$$\sigma_{s,t}^2 = \sum_{j=1}^N \sum_{k=1}^N w_{j,t} w_{k,t} \rho_{jk,t} \sigma_{j,t} \sigma_{k,t} \dots \dots \dots \text{Eq (i)}$$

We defined  $\bar{\sigma}_t^2$  to be equal weighted cross sectional average variance for the N

stocks,  $\bar{\sigma}_t^2 = \frac{1}{N} \sum_{j=1}^N \sigma_{j,t}^2 \dots \dots \dots \text{Eq (ii)}$

We let  $\xi_{jk,t}$  the pair wise stock specific deviations from the cross sectional variance average for variance.

$$\xi_{jk,t} = \sigma_{j,t} \sigma_{k,t} - \bar{\sigma}_t^2 \dots \dots \dots \text{Eq (iii)}$$

And rewrite the expression from stock market variance

$$\begin{aligned} \sigma_{s,t}^2 &= \sum_{j=1}^N \sum_{k=1}^N w_{j,t} w_{k,t} \rho_{jk,t} (\sigma_t^2 + \xi_{jk,t}) \\ &= \sigma_t^2 \sum_{j=1}^N \sum_{k=1}^N w_{j,t} w_{k,t} \rho_{jk,t} + \sum_{j=1}^N \sum_{k=1}^N w_{j,t} w_{k,t} \rho_{jk,t} \xi_{jk,t} \dots\dots \text{Eq (iv)} \end{aligned}$$

Thus, stock market variance is the sum of two terms. The first term is the product of the equal weighted average of individual stock return variances and the value weighted average return correlations across all pairs of stocks in the portfolio. The second term depends on the cross sectional relationship weights, pair wise correlations, and cross products of standard deviations. When all assets have same individual variance, the second term is equal to zero and the expression can be simplified accordingly

$$\sigma_{s,t}^2 = \sigma_t^2 \sum_{j=1}^N \sum_{k=1}^N w_{j,t} w_{k,t} \rho_{jk,t} = \sigma_t^2 \bar{\rho}_t \dots\dots \text{Eq (v)}$$

This expression has two components: average variance and average correlation. We approximated stock market variance with the right hand side of the Equation (v) (Pollet and Wilson, 2010)

The second important factor is the number of markets available to investors. An increase in the number of available market allow investors to move down along a given diversification curve. Earlier studies unduly emphasized on how increased correlation among markets in the new regime limits benefit of diversification ignoring the offsetting impact of increasing investment opportunity that was not available earlier. We refer this aspect often ignored by economists as ‘quantitative’ aspect of risk reduction. [Goetzmann et. al 2005]

To measure independent and joint impact of correlation and increase in international investment opportunity we developed the following model. Algebraically, the ratio of the variance of an equally-weighted portfolio to average variance of a single market is given by:

$$\text{Var} \frac{\left( \sum_{i=1}^n X_i / n \right)}{\frac{1}{n} \sum_{i=1}^n \text{Var}(X_i)} = \frac{\frac{1}{n^2} \sum_{i=1}^n \text{Var}(X_i)}{\frac{1}{n} \sum_{i=1}^n \text{Var}(X_i)} + \frac{\frac{1}{n^2} \sum_{i=1}^n \text{Cov}(X_i, X_j)}{\frac{1}{n} \sum_{i=1}^n \text{Var}(X_i)} \dots\dots\dots \text{Eq (vi)}$$

Using upper bars to indicate averages, this can be written as:

$$\text{Var} \frac{\left( \sum_{i=1}^n X_i / n \right)}{\frac{1}{n} \sum_{i=1}^n \text{Var}(X_i)} = \frac{1}{n} + \left( \frac{n-1}{n} \right) \times \frac{\overline{\text{Cov}(X_i, X_j)}}{\overline{\text{Var}(X_i)}} \dots\dots\dots \text{Eq (vii)}$$

As the number of countries [n] becomes large, this simply converges to the ratio of the average covariance among markets to the average variance. If the correlations among individual markets were zero, virtually all risks would be diversifiable by holding a portfolio that combined a large number of countries. By contrasts, in times of high correlations, even a large portfolio of country indices would experience considerable volatility. With a limited number of international markets in which to invest, however, ‘n’ may be small. Indian experience is satisfying in the sense; correlation of Indian market with the rest of the world is still encouraging from diversification perspective so possibility of risk reduction and scope of increasing the number of investible countries are wide.

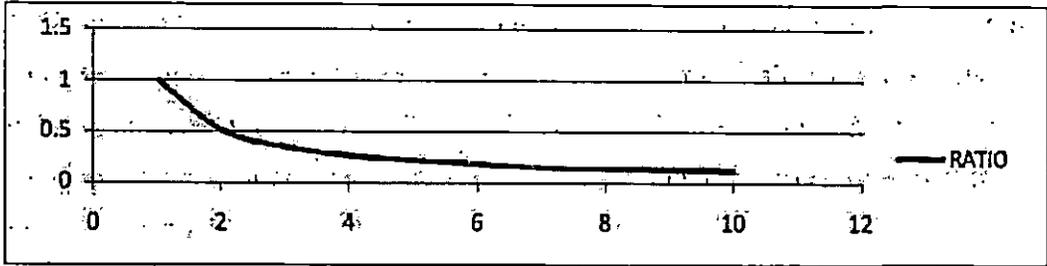
To calculate the separate impact of change in the correlations and secular increase of the investment opportunity set, we compute the above equations that gradually include;

1. First, we consider two developed countries that namely US and UK that are included in the sample.
2. Then we consider eight Asian countries that satisfy hypothesis of ‘proximity’.

In a sense we gradually increased and finally considered substantially large number of countries that is all ten counties that in a restricted sense represent world index [n = maximum available].

Figure 5.1

Reduction of Equity Risk: Country Effect



Countries included are: India, USA, UK, Japan, Singapore, Hong Kong, Malaysia, South Korea, Thailand and Taiwan

Figure compiled by the author

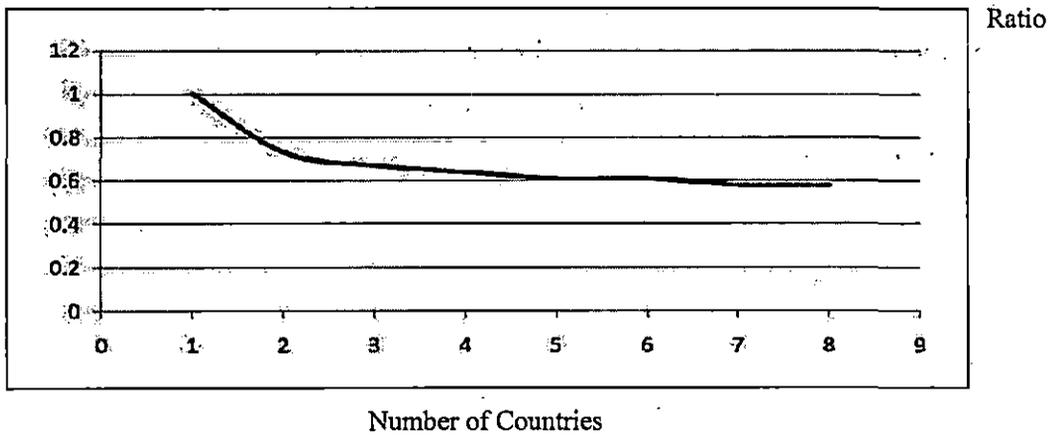
Figure 5.1 shows impact of change in the risk measured by correlation when investment opportunity set gradually increases. The final scenario gives the benefits of diversification for the full set of sample countries. In consonance with earlier studies, findings of present work suggest 'optimal portfolios are not necessarily well diversified' [Leavy and Sarnat (1970), Jorion (1985)]. Seven to eight countries are sufficient for maximum risk reduction as it is in our case there after it virtually remains constant.

International bond investment strategy involves some unique features that widely differ from equity such as markets are more likely to be disintegrated, comparatively more vulnerable to currency risk etc. Importance of bond market is gradually gaining importance in international investment as most of the pension funds in developed economy are primarily invested in bonds and those lessons may benefit us in future. For bonds, can we observe identical trend or it deviates from equity. Earlier studies suggest low or even negative correlation among international bond market [Bruno Solnik (1994), Sohnke and Dufey (2001)] and the reason emphasized is the national monetary Policies are not fully synchronized among countries thus co movement of long term Government bond yield is surprisingly low. However, the correlation among bond markets is higher among countries with strong economic and monetary ties such as European Union countries [E.U]. However possibility of high correlation is there for currency - hedged bond fund. The following table suggests benefits of

bond diversification of our sample countries that is closely similar to cross border equity investing.

Surprisingly the curve shown below (Fig. 5.2) may provoke us to question- does bond diversification gives us slightly lower benefit than equity. Marginal difference in findings is partly due to variation in correlation of bond yield and mostly due to variance of foreign currency which strongly influence bond return (Appendix 5 for global bond yield). Of course sample countries for equity and debt portfolio also varies and the latter includes all developed economy excepting India, countries that have incredible impact on world economy and closely integrated.

Figure 5.2  
Reduction of Bond Risk: Country Effect



Countries included: India, Hong Kong, Japan, Germany, France, UK, USA, France, Australia

Bond Data Source: Long Term Government Bond Yield As Reported In Reserve Bank of India Bulletin

Figure compiled by the author

The graph further shows only four countries are sufficient to enjoy bond diversification benefit even if it is not well diversified. So long we elaborated, benefit of expansion of investment opportunity set that account for large percent of the benefit of international diversification and the rest is due to low correlation.

Figure 5.3

Reduction of Portfolio Risk: Ratio of Portfolio Variance and Variances of Individual Countries

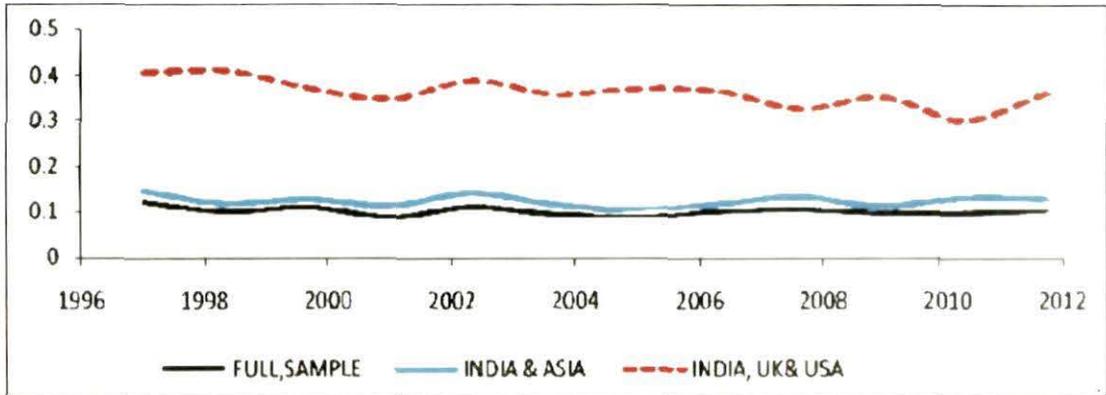


Figure compiled by the author

Figure 5.3 shows impact of diversification on the portfolio variance and the average variance of the countries. Addition of new markets changes the variance structure; the influence can either be positive or negative depending on whether the additional markets increase or decrease average among markets. First, we consider two major economies (US and UK) assuming Indian investors were allowed to invest only in these countries. Secondly we assume investment opportunity set was limited to only Asian countries and lastly all countries were considered. It is quite clearly visible that the ratio jumps down from 40% to as low as 10% when all the countries are introduced. It is evident that, apart from the covariance effect only the number of countries have a serious impact on portfolio risk.

## 5.3 INTERNATIONAL INVESTMENT: THE DOMESTIC-INTERNATIONAL APPROACH

Reduction of risk is undeniably important that would help to optimize risk-return profile of investment. Construction of such a portfolio is however not an easy task and we relied on a more practical and operationally manageable 'passive approach'. While constructing domestic portfolio we used BSE 200 (annualised daily log normal return) and long term Government Bond yield as reported in Reserve Bank of India Bulletin. While drawing efficient frontier following Markowitz's technique (1952) we started to assign weightages starting from all equity portfolio i.e 100% to stock and 0% to bond. Then we gradually increase the weightage of bond from 1% to all bond portfolio (100%). Table 5.1 shows the weight assigned and outcomes of the portfolio in terms of risk and return.

Figure 5.4

Indian Investor: Domestic Diversification-Stock and Bond  
1997-2011

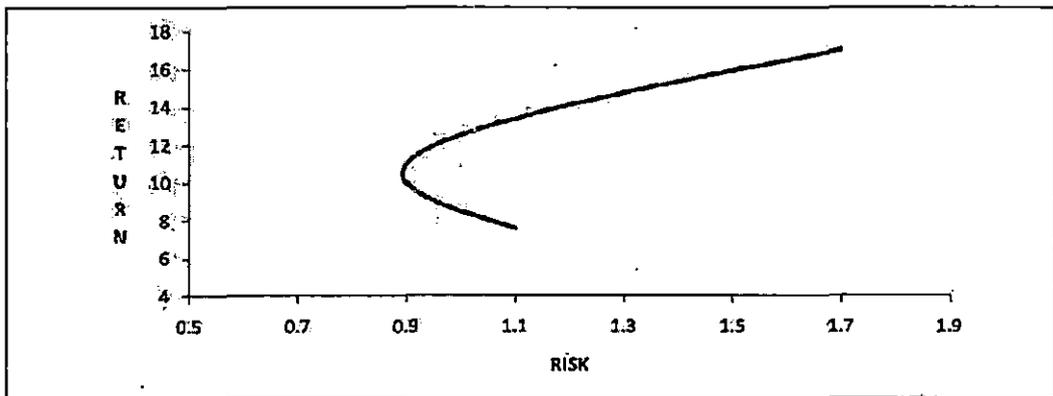


Figure compiled by the author

Efficient frontier for domestic diversification (Fig. 5.4) has been prepared by considering incremental allocation of 10% between the extremes of debt and equity. It may be reasonably argued 'why stock-bond' instead of 'large and mid-cap' stock combination. There are studies suggesting implications of large and mid cap stock combination on efficient frontier (Ruben and Melas, 2009). We relied on the popular belief supported by strong empirical evidences that portfolio should normally consist

of at least one important class of nonstock asset whose return covariance with the stock market is negatively related to average variance of stock and this is mostly satisfied by long term government bond. We have used local currency to calculate risk and return to represent hedged return. Alike many other emerging markets average return and risk of Indian market is too high. Return is 16.8% for equity (risk 7.7%) and 7.6% for 10 year Government bond (risk 1.6%). Thus risk premium is 9.2%. Whereas average world stock risk premium slightly exceeds 3 percent. Risk [α] return [r] trade-off for an equally weighted portfolio (fifty percent each) is roughly 8.44 for India. Minimum risk (1.47) portfolio (92% bond) can fetch a return of 5.9% and risk return trade-off is 6.86%.

Allmost in each country there are restriction on asset mix, optimal equity investment is restricted and most importantly for this section, foreign investment atleast for some fund is not allowed-so domestic diversification is only means for risk reduction. This restrictions are more stringent for pension fund <sup>(i)</sup>.

Following earlier discussions we attempt to show how risk-return profile changes while investing abroad and the strategy of accomodating properly the currency risk. For an international investor, the return on any foreign asset varies not only because of asset specific risk, but also because of unpredictable fluctuations in exchange rates. Currency risk is relevant not only for optimal portfolio construction but also for determination of international assets equilibrium returns and currency risk. In Euro Area country, an investor is aware of high likelihood of disappearance of the currency risk component of the total risk of his investment and concentrate on 'fully hedged' asset risk. We ignored currency risk as it is comparatively insignificant compared with market risk. A diversified European portfolio, such as the MSCI Europe index has a very small currency risk component. The currency risk contribution of non-EU countries is larger than those EU currencies, but it is still small compared with market risk. In a global portfolio (the MSCI world index), market risk is ten times larger than currency risk [Solnik and Michenaud, 2005]. While importance of currency risk is negligible, hedging is very costly in the long run because of the transaction costs and administrative burden of constantly monitoring and rebalancing the forward currency

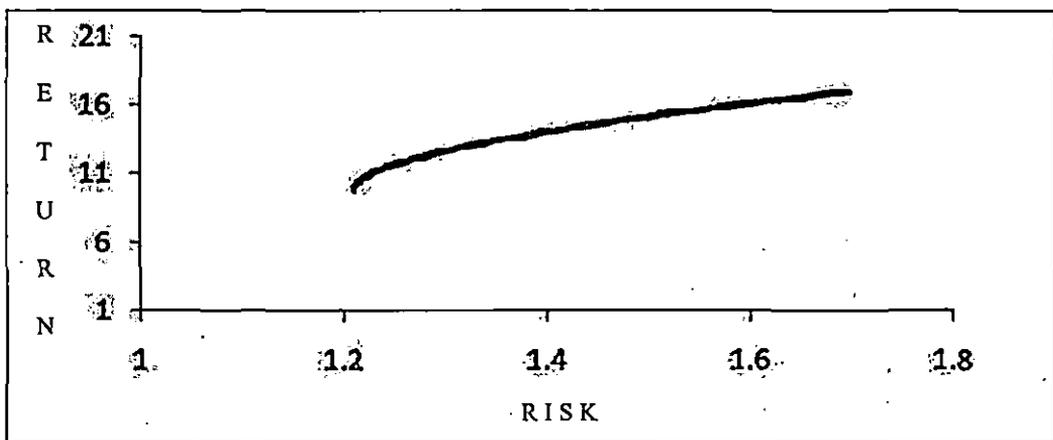
position. Often it is beyond the capacity of sophisticated investment manager to deal with the complex financial instruments that hedging can involve.

Investing in major Asia Pacific markets and two economic giants like USA and UK in true sense provide the benefit of world diversification of fund. This section presents risk-return tradeoffs and enhanced opportunities for diversification that are now available from the comprehensive coverage of the various equity market segments. We followed passive portfolio strategy and construct following efficient frontiers: i) firstly two stock portfolios consisting India and one of the other sample countries. ii) secondly three stock portfolio consisting India and other two Asian Countries (Japan and Singapore) then India and USA & UK. We assumed no constrain in investing abroad, though this assumption may be conveniently relaxed. All the efficient frontiers include 50 portfolios, weightage ranging from 100% to 50% in Indian stock. We don't go beyond that because investment beyond 50% in foreign market is practically not possible and it is not feasible too. In case of three stock portfolios the weightages are assigned ranging from all India portfolio (100%) to 50 percent India and 25% each for other two countries.

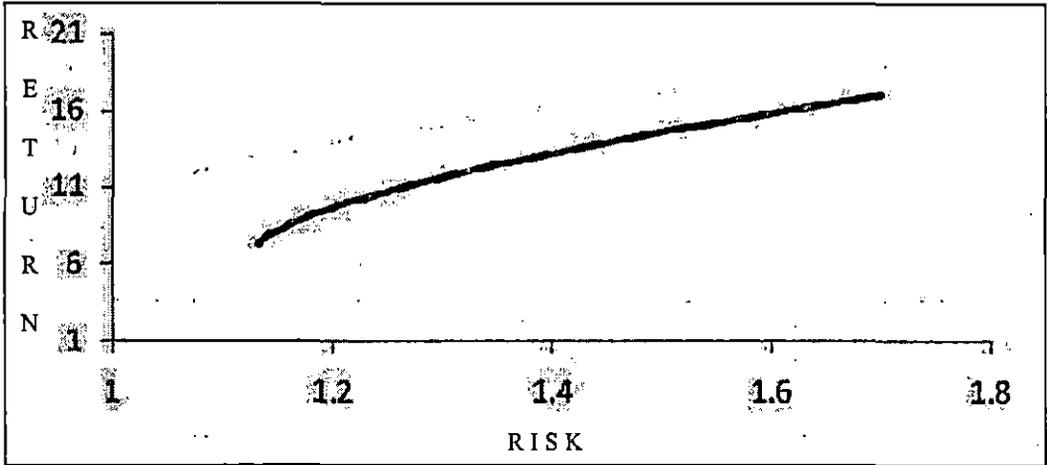
Figure 5.5

Indian Investors: Equity Allocation in Sample Countries  
 (Local Currency, 1997-2011)  
 (Based on annualised log normal return)

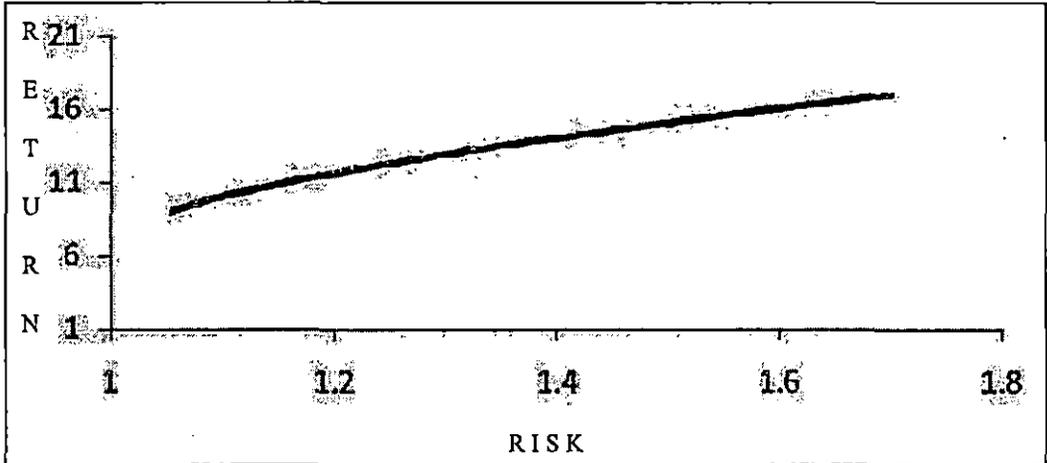
a) INDIA-HONGKONG



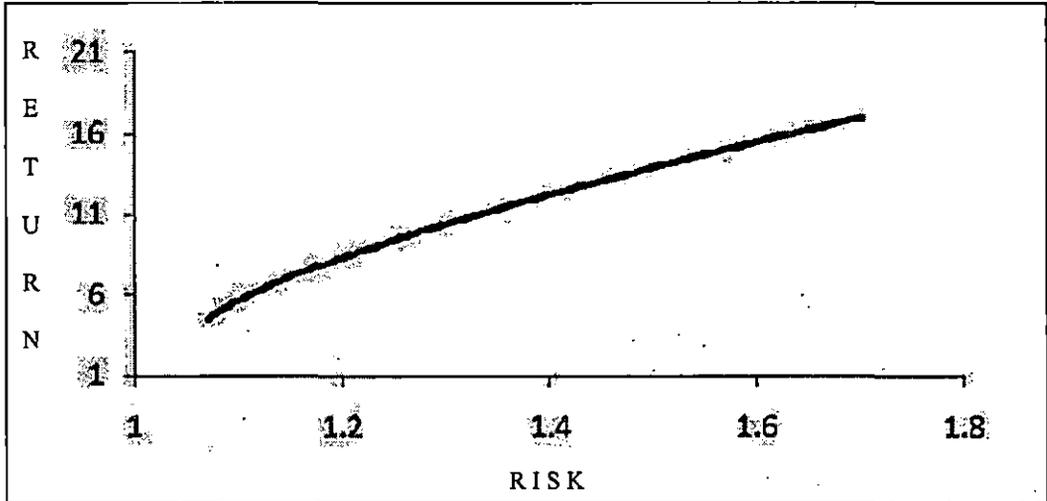
b) INDIA-JAPAN



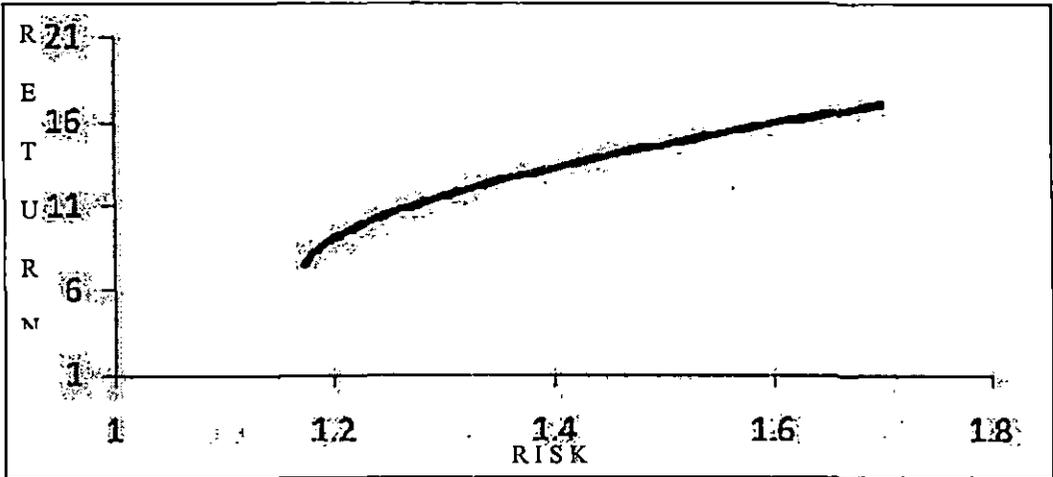
c) INDIA-MALAYSIA



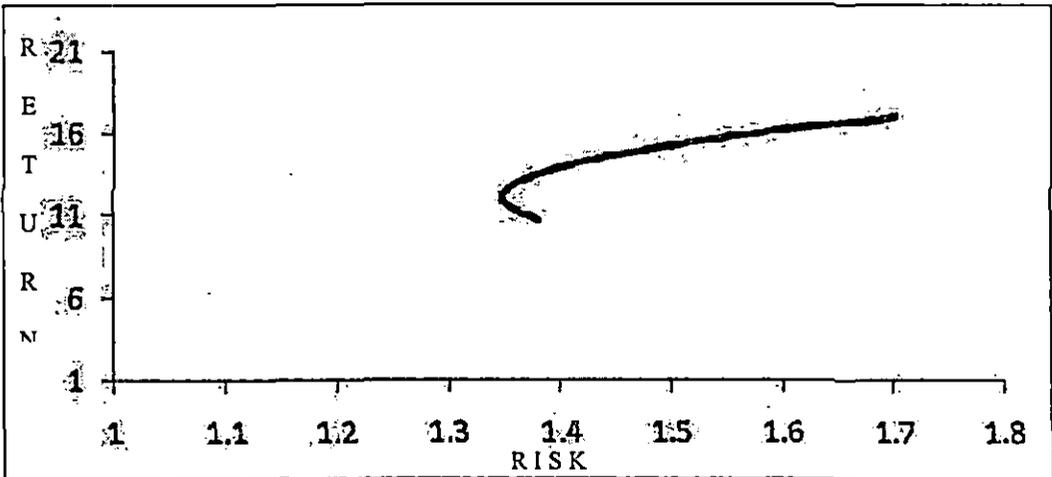
d) INDIA-SINGAPORE



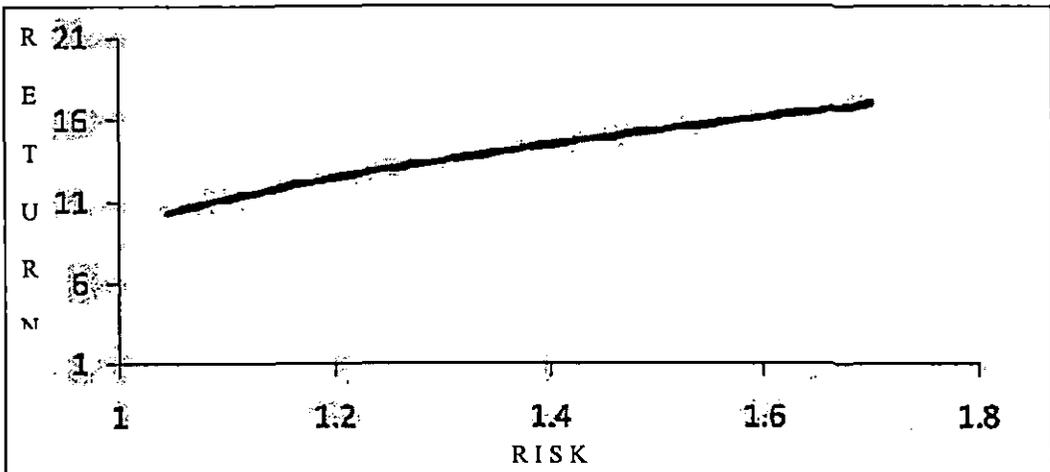
e) INDIA-TAIWAN



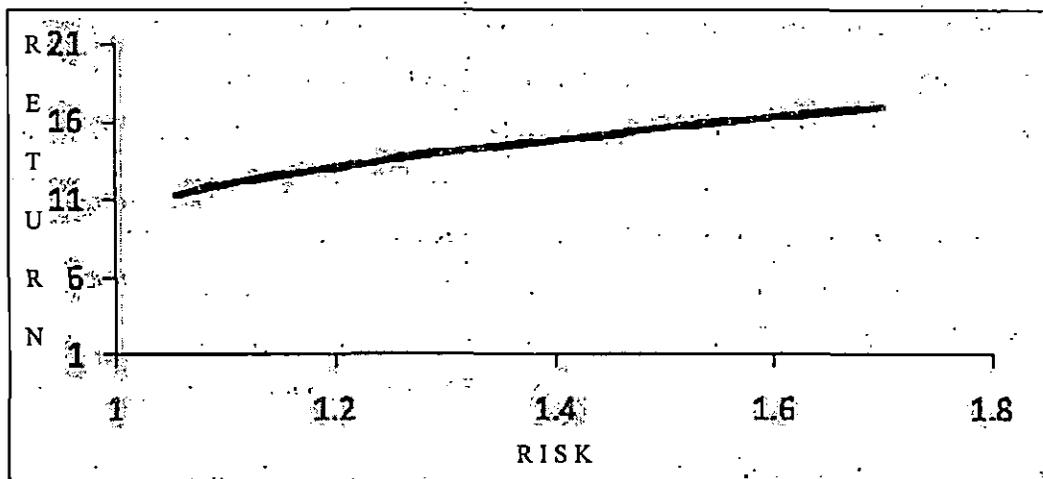
f) INDIA-KOREA



g) INDIA-UK



h) INDIA-USA



Figures Compiled by the author

In equally weighted portfolios (50-50) the return/risk ratio varies from combination to combination. Comparative studies [Figure 5.5 (a-h)] suggest go west approach is more beneficial than that of look east policy. Combination of India and USA is best, fetching maximum degree of risk return trade off i.e 10.2, followed by the combinations with UK (9.8). Singapore comes after that (8.5) followed by Korea (7.8). Benefits are same in case of Japan and Taiwan (6.4), while the trade-off is much less in Malaysia. That means combination with USA gives 20% better risk/return advantage than Asian best Singapore.

Following theoretical assumptions both return and risk of the sample countries are comparatively lower in comparison with Indian index excepting Korean index. Interpretation is the variation of the stock index return which is not explained by the world index is diversifiable in the context of a world market portfolio. Hence, in an aggregate perspective, expected return from global investment can be stated as follows;

$$R_{mt+1} - r_{f,t+1} = \beta_0 + \beta_1 \text{Var}_t[r_{mt+1}] + \lambda_{xt} + \epsilon_{t+1}$$

where,  $\beta_1$  is positive,  $\text{Var}_t[r_{mt+1}]$  is the conditional variance of the market returns of the other country,  $x_t$  represents other potential sources of variation in expected return  $\epsilon_{t+1} = 0$ . Campbell (1993) derives this relationship for a representative agent with

Epstein - Zin preferences under fairly general conditions. It is often assumed that the market portfolio satisfies a variance in mean relationship for excess log market return where  $\lambda$  is 0 in equation.

Again for an intensive comparative study of efficient frontier line and to analyze few theoretical underpinning we are considering three stock portfolios of India and Asia Pacific combination along with the case of Indian investors investing in USA and UK. Both are all equity portfolio simply scope of diversification is restricted to Asia-Pacific region in the second case.

Figure 5.6  
INDIA-ASIA & INDIA, USA & UK allocation  
(Local Currency, 1997-2011)

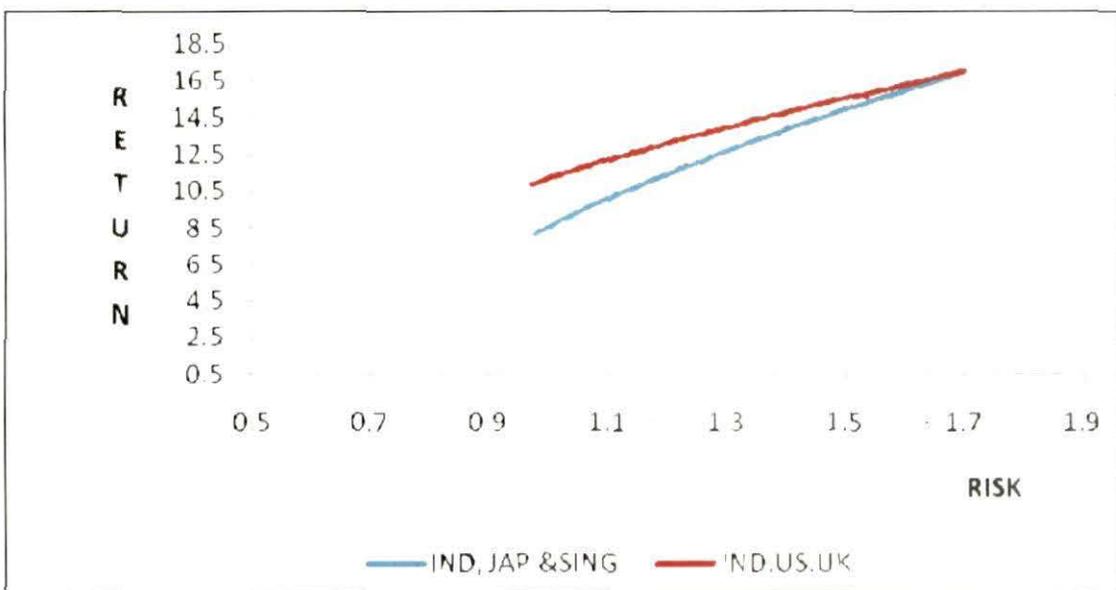


Figure compiled by the author

It is clearly visible from the figure 5.6 that, combination of India with USA and UK is giving better opportunity. investing 50% in India if any investors invest equally the remaining balance in USA and UK equally then he will get 11.14 return per unit of risk. The rate is 8.11 in case of Asian combination. The gain is more than 37%. The reason behind is, firstly the comparatively high correlation of Indian return with the Asian countries than that of the USA and UK, secondly the higher individual return of USA and UK.

Apparently, the stock markets of the country that are geographically close to each other show a stronger linkage than others (Bartram and Dufey 2001). Any solution in this line is suboptimal which is clear from the above graph drawn from experiences of Indian investor investing in Asia pacific region (Japan & Singapore): Same return can be earned with lower risk if funds were diversified in USA and UK.

## 5.4 CONCLUSION

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We can end up our discussion of this chapter saying that, though diversification gives better opportunity of risk reduction but unlimited diversification is not practically possible due to the policy restrictions of all of the countries. Hence the efficient frontiers to the investors in reality will be a suboptimal one.

### END NOTE:

i) New pension scheme: The subscriber will have the option to actively decide as to how the NPS pension wealth is to be invested in three asset classes;

E Class: Investment would primarily in Equity market instruments. It would invest in Index funds that replicate the portfolio of either BSE Sensitive index or NSE Nifty 50 index.

G Class: Investment would be in Government securities like GOI bonds and State Govt. bonds.

C Class: Investment would be in fixed income securities other than Government Securities Liquid Funds of AMCs regulated by SEBI with filters suggested by the Expert Group \* Fixed Deposits of scheduled commercial banks with filters \* Debt securities with maturity of not less than three years tenure issued by bodies Corporate including scheduled commercial banks and public financial institutions Credit Rated Public Financial Institutions/PSU Bonds Credit Rated Municipal Bonds / Infrastructure Bonds.

In case the subscriber does not exercise any choice as regards asset allocation, the contribution will be invested in accordance with the 'Auto choice' option. In this option the investment will be determined by a predefined portfolio. At the lowest age of entry (18 years) the auto choice will entail investment of 50 % of pension wealth in 'E' Class, 30% in 'C' Class and 20% in 'G' Class. These ratios of investment will remain fixed for all contributions until the participant reaches the age of 36. From age 36 onwards, the weight in 'E' and 'C' asset class will decrease annually and the weight in 'G' class will increase annually till it reaches 10% in 'E', 10% in 'C' and 80 % in 'G' class at age 55.