**SUMMARY**

**The Cross Section of Expected Stock Returns**

**Eugene F. Fama And Kenneth R. French (1992)**

**INTRODUCTION**

The basic idea of this article evolves from the very popular model, that is capital asset pricing model which is also known as Sharpe-Lintner-Black (SLB) model, as the birth of this model is marked by Sharpe (1964) and Lintner (1965) while Black (1972) has further extended pt. The foundation of CAPM is formed from the mean variance portfolio model of Markowitz (1959). According to Markowitz’s model the only two parameters about which investors cares while choosing portfolio are the mean and variance of the returns which they will get on their investment. The Markowitz portfolio efficiency can be described firstly as there is positive association between expected returns and the market B and secondly risk can be effectively measured by the market B. Testing the soundness and validity of CAPM is the basic objective of this research conducted by Fama and French (1992). The discussion in this study starts with the background of the topic and literature against and in favors of the basics of the CAPM model. The proposed study will serve professionals and academicians by stressing on the significance of beta with the help of which risk related to investment is measured by them.

Moreover loads of literature is included in this study which provides the source for checking the association between expected return and beta.

**LITERATURE REVIEW:**

The literature in this study is structured in such a way to discover such studies that are in contrast to the propositions of SLB model. Size effect by Benz (1981) is one of the major contradictions. According to Benz (1981) the association between expected return and beta is augmented by the market equity as stocks having low market equity are having greater expected returns due to greater risk as evident from their beta value while those stocks having large market equity have lower average returns. Moreover the study conducted by Bhandari (1988) is also in contrast to the SLB model which argues that there is direct linear link between leverage and average return. From the result of Bhandari (1988) it was evident that in such tests where beta and market equity was included there the variation in stocks return was explained by the leverage.

According to the research carried out by Stattman (1980) and Rosenberg, Reid and Lanstein (1985), it is argued that there is direct association between book to market equity ratio and expected return in US which similar result was evident from the study of Chan, Hamao and Laknishoh (1991) who found the same linear association between book to market equity ratio and the changes in average return in Japanese market. At the end it is argued in the study conducted by Baso (1983) that cross sectional changes in the average return are also explained by the earning price ratio. From the studies it is evident that the stocks with higher return and risk are found to have high P/E ratio and those stocks with low risk and return have low P/E ratio. In all the studies mentioned in the literature above SLB model has been criticized while the combined effect of all the above mentioned variables that have influenced an expected returns of stock has not been provided by the researchers. In order to fill this gap this study contributes to the existing body knowledge by presenting a combined effect of all the above mentioned variables in order to find out the soundness of SLB model and also to look for right substitute for market risk if the relation between beta and expected returns of this stocks is found to be weak.

In the studies conducted by Black, Jenson and Scholes (1972) and Fama and Macbeth (1973) positive association between beta and average stock return was explored in the period before 1969. While in other studies and in this studies it is evident that the relation between beta and average stock return has been vanished during the time period between 1963 to 1990.

**METHODOLOGY:**

All the non financial organizations listed as NYSE, NASDAQ and AMEX are included in the sample for the study. The reason behind not including financial firms is that the meaning of high leverage for both financial and non financial firms is not the same, as for financial firms it is normal while for non financial firms it is a distress .here the impact of beta , leverage, size, book to market equity and P/E ratio has tried to be explored on expected returns. It means that expected return is a dependent variable while the others are independent variables.

**Variable explanations**

1- **Beta** : With the help of beta volatility of stock as compared to market is measured

2- **Leverage**: It shows the amount of debt that is used by the firm to finance its assets. The more the debt used, the higher the leverage.

3- **Market Equity**: Its calculated by multiplying the number of shares outstanding with that of the share price.

4-**Book to Market ratio**: The value of a company is found through this ratio by comparing book value of a firm to its market value.

5-**P/E ratio:** It is calculated by dividing market value per share by earning per share. Ikt shows whether the stock is undervalued or over valued in market

The reason behind considering all these variables that can influence, the variation in expected returns is to show the compound effect of all these variables. For the purpose of testing the soundness of CAPM, Fama and McBeth regression approach has been used . this approach is comprised of two stages with the help of Fama–McBeth (FM) approach variances that exist within the portfolio are dealt with by dealing with individual stock’s characteristics.

First stage is comprised of beta calculation for individual stocks that are included in this study. Beta is calculated when the individual stock returns are regressed on market returns.

These calculated betas are then named as pre-ranking betas . as argued by Chan and Chen (1988) portfolios are formed on the basis of size on variety of betas and average returns are produced by the size. But here arises a problem due to the high correlation among the size of the portfolio and their respective betas , so in such test size and beta effect can not be separated in average return. Inorder to cope with this problem, on the basis of pre-ranking betas , ten portfolios are created.

For each and every month of the sample betas are calculated due to which there is variation in the betas of individual stock. With the help of this technique betas variation within the portfolio can be plummeted. With the help of the following equation, the individual stock beta can be calculated,

$$R\_{i}= α+ βR\_{m}$$

The portfolio based on pre-ranking betas are developed, now betas for portfolio are calculated. This time portfolio returns are regressed on market returns, for which 10 regressions are needed to be run. These betas calculated for portfolio are called post ranking betas . The betas calculated in this second stage then act as the independent variable . The next step is regressing portfolio return on post ranking betas. The soundness of CAPM is then judged from the slope of this regression. Zero value of the slope means that the assumptions of the CAPM are not valid while if the slope value is not zero so it means that the CAPM is valid.

Now consider the effect of size FM regression is customized , that is on the ground of relative market equity firms are included in the sample. The logic behind considering the size effect in the portfolio is evident in the study conducted by Chang and Chen (1988) who argued that although expected return is influenced by the size and beta but the problem of high positive correlation arises between the size and beta of the portfolio. As a solution for this problem and to include the size effect, the firms of sample are divided into groups called as deciles. Considering the market equity of firms, these size portfolios are developed. Now in order to separate the beta effect from the size ( as they are highly co-related) on the basis of pre ranking betas firms are placed into 10 portfolios. Due to which 100 size and pre ranking betas portfolios are created. The sample consists of 330 months of the time period of 1963 to 1990. When the beta value of the portfolio is estimated once , then this beta value is given to all the stocks included in the portfolio, and with the help of this beta values the individual stock return is identified. The motivation for going through all these processes in the methodology was to find out the strength and soundness of CAPM after isolating the size effect from beta .

**ANALYSIS AND INTERPRETATION:**

From the results of table 1 it is clear that the range of post ranking betas is enhanced when portfolio consists of both size and pre-ranking betas. When the size portfolio was further grouped on the basis of pre-ranking betas, so no association between beta and average return was found while strong relations between size and average return was evident which is in contrast to the SLB predictions. While when the only size effect was considered in forming a portfolio so the prediction of SLB model was supported, that says that there is a direct link between the beta and the average return, whereas it also showed a negative association between the size and the average return which is also consistent with the research conducted by (Banze, 1981). So it can be said that although there is a link between the size and average return but when the size effect is controlled the relationship between the beta and the average return vanishes. The regression result also showed that even if beta is the only single independent variable, there will be flat association between the beta and the average return, when changes in beta not in relation to size is allowed for. In table 3 the association of expected return examines one by one with each explanatory variables such as size, leverage and P/E ratio. Negative association between size and average return was found as the size of the stock increases so the average return decrease. While, the regression result shows that average returns are not influenced by beta as compared to the size which has a strong influence on average return.

***Book To Market Equity, E/P And Leverage:***

A strong association between average return and book to market equity is explored also it is explored that the effect of leverage and E/P ratio are disappeared when size and book to market equity are amalgamated.

There is a U shaped relation between E/P and average return as first average return reduces with negative E/P value and then it elevate as the E/P improves. Another result that is evident from table 4 is the direct link between book to market equity and average return, and the value of average return elevated from 0.30 % to 1.83 % with the increase in book to market equity ratio from its minimum to maximum. So it is clear from the spread of 1.53 % per month, that the association between average return and book to market equity is twice as strong as the association between the size and the average return, as that spread between size and average return was 0.74% per month. It is also concluded that the firms with negative BE ratio have high returns, in the same manner as the firm with high BE/ME ratio have high average returns. The reason behind this is that both negative BE ratio and high book to equity ratio are the indication of worse earnings.

***Fama and MacBeth regression:***

When regression was run to find the average return and leverage association an interesting fact about BE/ME ratio and average return’s association came forward. Two leverage ratio are used that is1 ) book asset to market equity and 2) book asset to book equity. Market leverage is estimated with the help of A/ME and book leverage is measured by A/BE. Natural log of these ratios is used during regression as interpreting the impact of leverage and book to market equity on average return is made easy with the help of logs. The FM regression results between the average return and leverage the two variables are quite confusing as the relation between A/ME and the average return is positive, which is also explored by Bhandhari (1988), while there is a negative association between A/BE and the average return. Although both the results are slops with opposite signs, but taking their absolute values are much closer to each other. But actually the difference between A/ME and A/BE is equal to BE/ME ratio, also the average value of the slop of BE/ME is much similar to the absolute value of the leverage ratios. As the leverage and book to market ratios are so closely related, so the impact of BE/ME on average return can be interpreted in two ways, 1) First the high BE/ME ratio can be thought of as firm having poor earnings ( Distress effect). 2) Secondly, the high BE/ME ratio indicate that as compared to book leverage, the leverage imposed by the market is more.

From the table 4 it is evident that there is a U shaped association between E/P ratio and the average return, if only E/P variables are used. In this study dummy variables are used in place of E/P, while there are negative earnings, as in this case E/P cannot be used to predict for expected returns. From the slope of dummy variables for E/P it is clear that the average return is enhanced for negative earnings. But this effect of dummy variable is vanished when size is included in the regression. It is clear that when regression include both size and BE/ME ratio, so the average value of the slop of E/P is reduced but in opposition to this result, the slop of ME ratio and BE/ME ratio is similar if E/P ratio is included or not.

***Average Return, Size and Book To Market Equity:***

The results in table 5 shows that when the size is controlled for , strong changes in the average return occur due to the book to market equity. While, size effect is left in average return when book to market equity is controlled.

***Size and Book to Market Equity:***

Negative correlation is evident between the size ( ME) and book to market equity ( BE/ME) as evidenced from this value -0.26. It means that when a firm will be having low market equity so it will be expected to have poor earnings and so the stock crisis decline and so in return book to market equity is enhanced. Similarly, if the firms are having high market equity so the market will perceive them to have higher future earnings in the return the stock prices also raise, while book to market equity and average return drops. The regression results in table 3 are affected due to the correlation between size (ME) and market to equity ratio (BE/ME). As a slight change is evident in the slop of ME ratio from -0.15 to -0.11, when BE/ME ratio is added in the regression. In the same manner , when ME ratio is included in the regression so the slope of BE/ME ratio declines by 0.25 ( from 0.50 to 0.35) . The reason behind the influence of size in regression is because the stocks having small ME mostly having more BE/ME ratio, and the reason behind the influence of book to market equity ratio in regression is because stocks having high book to market equity often have reduced ME. So it can be concluded that in order to investigate the variation in the average stock return, both ME and book to market equity ratio are essential.

***Sub period averages of FM slopes:***

* In table 6 , the FM regression slopes of two sub periods that is ( 1963 to 1976) and (1977 to 1990) has been compared.
* In both the sub periods the importance of beta is not explored, only it is a bit positive in the sub period of 1963 to 1976, which indicate delicate size effects in the sub period of 1977 to 1990.
* As the average return and book to market equity ratio linkage is so compact and strong as a result it is invisible from the slopes of both the sub periods . So this is further proved that variation in the stock average return are strongly determined and explained by the book to market equity ratio out of all the mention variables.
* It was also argued by Roll (1983) and Keim (1983) in their research study that the size effect play stronger role in the month of January. But the book to market equity ratio and average return positive linkage so well-built throughout the whole year.

***Beta and the Market Factor:Caveats:***

Some explanatory arguments are presented on negative role of Beta in explaining the average return. the definition of average variables play important role in the average premium of these variables. if the book to market equity is replaced by book equity so it will not affect the value of R2 until size variable is present in the regression . But this exchange of variables, shift the slope of ME upward. In the same way redefining the other variables will also bring changes in the slope of regression

Similarly all the tests in order to check these different types of relationships are conducted on stocks, no other assets are included in tests. So there is possibility if the same tests are run on using other assets like Treasury bills and other bends might change the opinions of researcher regarding the function of beta.

**CONCLUSION:**

Overall the purpose of this study conducted by Fama and French((1992) was to check the validity and soundness of CAPM by presenting the combined effect of the variables such as ME, BE/ME, leverage and E/P ratio on the average return of stocks and also to look for the appropriate subtitle for market risk in case weak relation between expected return and beta is observed. Data from all non-financial firms listed in the sample, which Fama and McBeth regression has been used to list the CAPM's soundness. The sample period ranges from 1963 to 1990. In the literature so many such studies are included that clearly contradict the proposition of CAPM. But the results of this study are consistent with the results of Reinganum (1981) and Lockonishok and Shapiro (1986) who explored that during 1963 to 1990 the relation between beta and the average return vanishes. According to Benz (1981) the association between expected return and beta is augmented by the market equity as stocks having low market equity are having greater expected returns due to greater risk as evident from their beta value while those stocks having large market equity have lower average returns. Moreover the study conducted by Bhandari (1988) is also in contrast to the SLB model which argues that there is direct linear link between leverage and average return. From the result of Bhandari (1988) it was evident that in such tests where beta and market equity was included there the variation in stocks return was explained by the leverage. Claims of SLB model are discarded by the findings of this study. In this study when the association of the average return was investigated separately with each explanatory variable , so significant association was evident . Out of all the explanatory variable the size factor was discovered so have strongest influence the average return.

Overall in this proposed study carried by Fama and French (1992) the involvement of beta in the average return variation has been discounted , where some other variables are identified that can play major role in describing the variables in average stock returns, one of which size, that is market equity through which variation in the expected return can be analyzed. Also book to market equity can also be used to evaluate the variations in expected returns.

**Applications:**

As the main result indicates two variables (Size and book to market equity), capable of explaining the stock’s average return variations, the question is whether it can be prescribed for further use or not? So its answer depends on its persistency and rationality of asset pricing. As there is possibility that the association of size and BE/ME to average return is explored by chance but actually they are not related to the expected returns but this possibility is really weak for book to equity ratio due to following reasons. Firstly because this relation of BE/ME to average return has not weakened in the time period between 1963 to 1990, also in the sub periods of 1963 to 1976 and 1978 to 1990this relation has consistently being strong . Secondly, it was also proved that firms with high BE/ME as compared to low BE/ME firms were really worst earners. Also during 1980 small size firm earnings were really depressive in comparison to large firms. on the basis of above mentioned points it can be said confidently that size and book to equity variable can be used as proxy for beta is explaining the variation is average return of the stocks.

Now, if these results of the study are not by chance so investors who are concerned with average return can use it for evaluating the performance and forming the portfolio. Also through these results portfolio's performance can be analyzed by comparing the average return of this very portfolio with that of benchmark having similarity in the size and book to market equity ratio.