

**IMPACT OF MULTIFACTOR ASSET PRICING MODEL ON
STOCK RETURNS UNDER THE FRAMEWORK OF
DOWNSIDE RISK IN PAKISTAN STOCK EXCHANGE**

By

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ABSTRACT

Thesis Title: Impact of Multifactor Asset Pricing Model on Stock Returns under the Framework of Downside Risk in Pakistan Stock Exchange

This research examined the relationship between portfolio return and multifactor asset pricing model such as downside risk, size, value, profitability, investment and momentum. The data for the companies is collected from website of Pakistan Stock Exchange, Data Stream and Financial reports of the listed companies from the period 2000-2015. Fama-MacBeth (1973) methodology is used to test the hypothesis. Portfolios of returns made for better results. The results show that all factors have insignificant outcomes mostly which lead towards in favor of null hypothesis i.e factors considered having impact on stock returns either positive or negative. The Downside market Risk gives overall insignificant results show their impact on portfolio stocks return. Which means this variable have importance for investors while doing investment. DRM will represent the relationship between risk and expected return in better way. The results of the study for the factor of SMB (small minus big) supported null hypothesis which means the SMB have impact on the portfolio returns. The result showed that small companies outperform big companies. Insignificance of the factor HML supported the null hypothesis that HML has impact on stock portfolio returns. . The finding for CMA is also in the favor of null hypothesis which shows the impact on stock portfolio return. The findings regarding the momentum (WML) factor in this study supported the null hypothesis for all generated pool. The results of profitability (RMW) have insignificant results supported null hypothesis that has impact on portfolio returns.

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Ayesha Liaquat

DEDICATION

I dedicate this thesis to my family. Without their patience, understanding, support and most of all love, the completion of this work would have not been possible.

CHAPTER NO.1

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

This research examines the relationship between stock returns and multifactor asset pricing model such as size (SMB), investment (CMA), value (HML), profitability (RMW) and momentum (WML) under framework of downside risk (DRM).

Size of firm is calculated by capitalization of firm and it categorized into small capitalization firm and big capitalization firm (SMB). Investment is another market tool to check the relation between return and risk. Investment calculated by total asset of firm and categorized into high investment firm and low investment firm (CMA). Value is another market indicator to measure the risk. Profitability of firm calculated by earning per share and it divided into high profitability firm and low profitability firm (RMW). Momentum is another factor which impact on stock returns and it is calculated by average return of last 12 months and categorized into high past return and low past return firms (WML). Downside risk (market risk) factor is calculated by downside market risk (DMR).

A proper risk measure helps determine appropriate risk-adjusted returns for bearing a given level of risk. There exists a large body of literature attempting to identify the risk measure that better explains the cross-section of stock returns. Yet, no consensus has been developed among researchers to identify a proper risk measure that better captures investors' risk perception. Therefore, the question which individual risk measure is best in explaining equity returns remains one of the major topics of empirical investigation in finance literature. Most of the existing empirical studies have attempted to investigate the ability of different risk measures in combination in order to explain stock returns. There is strong evidence that the mean-variance CAPM performs poorly. A criticism of the mean-variance CAPM is its disregard to up and down movements of asset returns. The concept of downside risk is considered as an alternative. However, only a few studies compare the performance of the mean-variance CAPM and the

pricing models in a downside framework.

After the financial disasters, financial market and investors are in a state of confusion. Experience and well educated market players analyze the performance of stock market due uncertainty, fluctuations, movement and rapid changes in the stock price. But lay and uneducated investors are confused either to buy or sell the stock. The optimal and outmost objective of every investor is to attain a higher future return thus maximizing the return. In order to get the prime benefit of stock returns; investors avoid the risks due stock prices volatility and movements.

Risk management is more important in terms of managing it after the market failure in 2008. Derivative market factor like financial market globalization, technology development, integration of financial system and complexity create new sources of risks that need to be managed and identified properly. The growth of financial system regarding trade activities result in more financial risk for both firms and investors. That's why needed better risk management to identify and measure risk. Uncertainty of losses known as financial risk. Investors are more concern about their losses. That's why this study highlights the importance of downside risk and test whether the downside risk is better measuring tool in asset pricing model. In this study we use multifactor asset pricing model to check the impact of these factors on adjusted return or return portfolio under framework of downside risk in Pakistan Stock Exchange (PSX).

1.2 Background of study

Investors are mainly concerned about the movement of stock prices and volatility as their wealth is directly affected in the form of capital increase & reduction. The investor constantly reviews stock market volatility, stock prices and performance of the company. Market makers, researchers and investors depend on the market indices such as to investigate the performance of stock market dependence is on price-earnings ratio. Market multiples such as price per share, price to earnings ratio, price to book ratio, price to cash flow ratio, are the measured used as market indicators. These multiples are used to evaluate stock of the firm that is whether stock are undervalue, overvalue or equally priced as compared to industry (Stowe, 2007).

Harry Markowitz (1952) presented Modern Portfolio Theory. CAPM is built on the basis of this MPT. Sharpe (1964) Capital Asset Pricing Model suggests that the expected returns of

risky assets should be determined by the covariance of their returns with the returns on the market portfolio. Capital Asset Pricing Model (CAPM) assumes that the relationship between risk and return is positive, linear and significant. The CAPM divides the risk influencing an asset's expected return into two categories, one type is unsystematic risk or specific risk, and the long-term average returns for this typical risk should be naught. Another type is due to general economic uncertainty, CAPM asserts that the risk is priced by rational investors is systematic risk, because that risk cannot be eliminated by diversification when an investor holds the market portfolio, each individual asset in that portfolio entails specific risk. Systematic risk can be measured by using beta.

CAPM is a model that attempts to describe the relationship between the risk and the expected return of an investment that is used to determine an investment's suitable price. The formula used to create CAPM is the expected return of a stock equals the risk-free rate plus the portfolio's beta multiplied by the expected excess return of the market portfolio. The CAPM shows that risks can be used in the capital market, where risks can be bought, sold and assessed. In this way, the prices of risky assets are adjusted to make portfolio decisions. A lot of studies have been done to test the empirical validity of CAPM. The results of the studies done by (Black, 1993; Eatzaz & Attiya, 2008; Rehman & Javed, 2013) show that CAPM hold which means that there is a positive, linear and significant relationship between risk and return. The capital asset pricing model of using the model provides about the market pricing of securities and expectation return rate determination of thoughts, it can also be widely used in the investment management and corporate finance. Its many uses make it popular among investment workers (1) used for risk investment decision (2) used for portfolio decisions; the capital asset pricing model is derived from the portfolio theory, and it turn for portfolio decisions.

Different researcher criticizes the CAPM model. Studies that gave a different answer to CAPM were conducted by (Banz,1981; Basu,1977; Bhandari,1988; Fama & French,1992; Groenewold, 1997; Gomez & Zapatro, 2003) they founded that in addition to beta size and Book to Market ratio also effect the stocks return. A number of studies found that the variation in average security returns cannot be explained by the market beta alone and showed that fundamental variables such as size (Banz, 1981), macroeconomic variables and the price to earnings ratio (Basu , 1983), book-to-market ratio (Reid *et al.* 1985; Chan *et al.*, 1991) account

for a sizeable portion of the variation in expected returns.

Fama and French (1992) observed that the two non-market risk factors size (calculated by small cap firms minus big cap firms) and value (calculated by High book to market ratio- low book to market ratio firms) are useful factors when explaining a Cross-section of equity returns. He observed that two classes of stocks have tended to do better than the market as a whole

- Small Capitalization
- Stocks with a high book to market Ratio.

Fama and French (1992) found that investors are concerned about three separate risk factors rather than just one. Actually, they found that in the real world, investors care about lots of different risks. But, the risks that have systematic prices attached to them and that in combination do the best job of explaining performance and pricing are market, size and value.

Investor returns are the mirror image of a firm's cost of capital. Even in the secondary market, the cost of a firm's capital is best estimated by the price of their securities. Small firms must pay more for capital when borrowing or issuing securities in the capital markets. Distressed firms (value), those that have poor prospects, bad financial performance, irregular earnings and/or poor management must also pay more for capital. Small firms and distressed firms have lower stock prices to compensate investors for these risks. Fama & French (1992) found that most appropriate measurement of the one with the most explanatory power was the ratio of the stock's adjusted Book value to its Market price (BTM). Stocks with high BTM are value stocks.

Daniel and Titman (1996) tested the Fama & French model on NYSE, AMEX and NASDAQ for the period 1963-1993. Their findings do not support Fama & French model. They concluded that there is no relationship between expected return and Fama & French risk factors. Carhart (1997) included momentum factor in the Fama & French three factor model. When the prices of the stock are rises, the trend of price rises is called momentum effect. When the tendency of the prices move downward than stock prices decrease also referred as momentum effect (Kent, 2014). Carhart (1997) develop the four factor model which represents an asset pricing model by owing to the fact that the three factor model of Fama & French (1993, 1996) could not explain the Momentum effect presented by (Jegadeess & Titman, 1993).

This model was an expansion of the Fama & French three Factor Model with addition of one additional factor; momentum. This factor was added, because many studies, like (Jegadeesh & Titman, 1993; Fama & French, 1996) founded that it is possible to increase your earnings by buying stock that was doing well over the last 1-6 months and selling stocks that were doing badly over the last 1-6 months. This strategy is often used in cases when you have to decide in a couple of minutes which stocks you wish to buy. Buying stocks that just lost a lot of value and selling stocks that increased in value tends to give good results. The reason behind that the market always corrects itself. After a large gain in value, there are always people that wish to cash out their profit and sell their stock for the high price, decreasing the value of the stock in the process. Another theory says that after a large increase in value, the stock may be overpriced and will quickly return to its real value. Andrew et.al (2001) founded that high returns associated with the momentum strategies (Jegadeesh & Titman, 1993) are sensitive to the fluctuations in downside risk. Past winner momentum portfolios have greater exposure to the downside risk factor than past loser momentum portfolios.

Fama and French (2015) developed a five-factor model based on their three-factor model. They have discovered that average stocks return can be better explained by adding two more factors which are operating profitability and investment. The tracking period was July 1963 through December 2013, which was 264 months longer than the tracking period of their 1993 study. This may affect the comparison of the results in these two studies. The sample is, however, the same from all NYSE, Amex and NASDAQ stocks. The way Fama & French constructed the market factor, size factor, and value factor was the same. On the other hand, they calculated the operating profitability in a way which revenues subtract cost of goods sold, subtract selling, general, and administrative expense, subtract interest expense all divided by book equity.

The investment was measure as the change in total assets from the fiscal year ending in year $t - 2$ to the fiscal year ending in $t - 1$, divided by $t - 2$ total assets. As the three factor model ignored profitability and investment as they are significant variable which determine the average return. In Fama & French five factor model these two profitability and investment factor added. The model's main problem its failure to capture the low average returns on small stocks that invest a lot despite low profitability.

1.3 Problem Statement

The problem is to explore the impact of multifactor asset pricing model on stock returns under framework of downside risk. If there is any association then how this relationship is beneficial for investors, managers, researchers and business organization etc. In the theory of the mean-variance framework of a portfolio selection, variance is used as the risk measure (Markowitz, 1952). However, variance has been criticized as a risk measure as it equally weight the upside risk and the downside risk. In general, investors are more concerned about the downside risk as it results in losses while the upside risk results in unexpected profit. For investors deciding how to allocate assets a downside risk measure might be a better approach than using variance.

While selection of portfolio, investor has tended to be careful firstly, about higher average return portfolio, secondly, portfolios having lower risk or deviation. Thirdly, they take such portfolio, which does not perform poorly. Investors are more conscious about risk which is associated with losses in recession periods with lower mean and bit higher risk. Investors now may differ in their desire or ability to take on recession –related risk as well as in their tolerance for accepting the overall risk.

In order to minimize their risk and maximize their returns on investment, investors use different market indicators. Thus, the ultimate and utmost objective of the investor is to earn maximum return. Investors try to maximize their return on investment. Investors are more conscious about their losses. To predict losses they need better portfolio that's why this study focus on to determine better multifactor asset pricing model.

Several studies and researches have been performed on the stock market returns because it helps both the investor and the firms to identify what affect their investment returns and firms stock value respectively. An investor considered two factors in the selection of stocks that is risk and return. In order to minimize risk and to maximize return, investor use market multifactor to pricing an asset (Alroaia et al, 2012).

Business organizations always try to improve firm value to attract investors and improve their creditworthiness. The relationship also helps firm managers and investor to achieve their

related objective. Thus, investors and managers can get a high return by investing in the stocks which have a high returns by examine their previous return in market. This research aims to determine an appropriate asset pricing model which helps the investor to price of asset in a better way in Pakistan Stock Exchange 2000 to 2015.

1.4 Problem Definition

Investor considers two factors while investing in a firm that is risk and returns. They are more concern about downside risk. Investor wants to minimize the risk factor and want to generate maximum return. Therefore investor face two problems how to increase their profit at maximum level and how to reduce risk at its minimum level. On the other hand business organization always face problem how to improve their firm value to attract investors and to insure their creditworthiness in the industry.

1.5 objective of the Study

The main objective of this study is:

- To investigate the effect of multifactor asset pricing model (Size, value, investment, profitability and momentum) on stocks return under framework of downside risk in Pakistan Stock Exchange.

The secondary objectives of the study are:

- To examine impact of factor size on portfolio return under framework of downside risk of listed companies in Pakistan Stock Exchange.
- To examine impact of factor value of the firm on portfolio return under framework of downside risk of listed companies in Pakistan Stock Exchange.
- To examine impact of factor investment on portfolio return under framework of downside risk of listed companies in Pakistan Stock Exchange.
- To examine impact of profitability on portfolio return under framework of downside risk of listed companies in Pakistan Stock Exchange.
- To examine impact of momentum on portfolio return under framework of downside

risk of listed companies in Pakistan Stock Exchange.

1.6 Research Questions

There are some research questions prior to examining the stock return on the basis of multifactor and downside risk.

- Dose size of the firm effect better explain the cross-section of portfolio returns under the downside risk framework?
- Dose value of the firm effect better explain the cross-section of portfolio returns under the downside risk framework?
- Dose investment effect better explain the cross-section of portfolio returns under the downside risk framework?
- Dose profitability effect better explain the cross-section of portfolio returns under the downside risk framework?
- Dose momentum effect better explain the cross-section of portfolio returns under the downside risk framework?
- Dose downside risk perform better, when it is applied to pricing an asset by taking into account size, value, investment, profitability and momentum factor?

1.7 Contributions to the Study

This research highlights the performance of listed firms in Pakistan Stock Exchange. Investors are more conscious about losses so that's why firstly this research helpful for investors prior to their investment decision to investigate the performance of the listed companies. Secondly this research is evidence that investor concern about their returns and they are more conscious about their losses so they should invest on the basis of portfolio investment to reduce their risk.

This study also highlights the role of small companies and big companies regarding their stocks return. It also highlights that small companies perform better or big companies. It also highlight that the impact of multifactor is more either on big companies or small companies. This study highlights either downside risk performs better when it is applied to pricing an asset in

small companies or big companies. This study compares the performance of small companies and big companies regarding multifactor asset pricing model. This study demonstrates the performance of all companies listed in Pakistan Stock Exchange from 2000 to 2015.

1.8 Significance of the Study

This research is beneficial for investor for investment purpose. The increasing trend in investment activity has made the environment more volatile which exposes firm and investors to more financial risk. Investors need a model with which they estimate their investment risk and increase their earnings. The asset pricing model is giving the way to forecast the risk and the impact of risk on stocks return. The investment creates employment. The investment creates income. When investor made investment and they earn return then they made consumption. That's why investment is important for stock exchange.

Downside risk is important factor which make investor more conscious about their investment. The study is useful for investor point of view because investor more conscious about their risk. The investors use this model to estimate the risk including all market factors and also can check their returns on investment. A suitable asset pricing model for a stock market of a country has been an area of great interest for researchers, academicians, corporate managers and policy makers alike because Mispricing of assets may contribute to financial crises and such crises can damage the overall economy.

The behavior of asset prices is essential for many important decisions, not only for professional investors but also for most people in their daily life. The choice between saving in the form of cash, bank deposits or stocks, or perhaps a single-family house, depends on what one thinks of the risks and returns associated with these different forms of saving. Investors desperately need a model with which they can forecast returns, diversify their risk and increase their earnings.

So this study will provide a model under the downside risk framework which helps the researchers, academicians, corporate managers and policymakers and investor for better pricing the assets diversify their risk and increase their earning. Asset prices are also of fundamental importance for the macro-economy because they provide crucial information for key economic

decisions regarding physical investments and consumption.

Asset pricing models assess risk-return relationship in order to ensure value for the stakeholders in financial markets. There are more than one assets pricing model and the focus of this study is whether the market premium, Size and value is enough to explain the stock market dynamics or other factor such as momentum, Investment and Profitability is also important to predict the stock market return under the framework of downside risk. This study is different from the other studies because the combined effect of multifactor model is not comprehensively tested under the framework of downside risk in Pakistan Stock Exchange. A lot of studies has been done on the empirically testing the validity of CAPM (Javid & Ahmad, 2008; Iqbal & Brooks, 2007) Fama & French three factor model (Beenish & Moazzam, 2013) and Carhart four factor model (Madiha & Abu baker ,2014)under the traditional risk-return relationship in the stock market of Pakistan. The studies related to downside CAPM (DCAPM) (Rashid & Faiza, 2015; Usman et al, 2013; Akbar et al, 2012) has also been conducted on PSE but the validity and combined effect of multifactor model under the framework of downside risk on PSE is not yet tested.

This study ensures the role of listed firms in PSE. First of all, this study is a supportive tool for stockholders and corporate managers because it provides a model under framework of downside risk for better pricing of assets to minimize their risk. Secondly, this study provide an evidence that investor can invest on the basis of this model in order to diversify their risk increase their earnings. This research is quit beneficial for corporate managers and policy makers regarding investment point of view. Because it provide a model with downside risk factor for better pricing of assets, diversify their risk and increase their earnings.

1.9 Scope of the study

With the development of financial markets throughout the years, the importance of risk Management has increased, especially after the market failure in 2008. Globalization of Financial markets, financial integration, technology improvement in trading systems and more complex derivative markets, result in new sources of risk.

The growth in trading Activity has made the environment more volatile, which exposes firms and investors to more financial risk. The expansion of complex financial structures calls for a better risk Management where risk must be accurately identified and measured. Financial risk is the uncertainty of possible loss. The purpose of this study is test whether the downside risk is a better tool in investment management than variance.

In this study we use multi-factor model in downside risk framework to understand the impact on the expected return of a portfolio for better estimation of risk adjusted return in Pakistani Stock Market (PSE). Investors desperately need a model with which they can forecast returns, diversify their risk and increase their earnings. There is strong evidence that the mean-variance CAPM performs poorly. A criticism of the mean-variance CAPM is its disregard to up and down movements of asset returns. The concept of downside risk is considered as an alternative. However, only a few studies compare the performance of the mean-variance CAPM and the pricing models in a downside framework. This research will help the investors to estimate the returns of the portfolio in a better way. This study gives numerous utmost benefits to economists, analysts, researchers and investors and business organizations simultaneously. They all can get optimal benefits from this research in achieving their individual and collective objectives.

1.10 Organization of the Study

The first chapter of the study covers the introduction of the study, the problem statement, the definition of the problem, the objective of the research, research questions, the contribution and importance of the study, the scope of the study. The second chapter of the literature review is based on diverse empirical studies conducted in past such as efficient market hypothesis, modern portfolio theory, random walk theory, behavioral finance, review of research literature by different researchers in different markets in different countries, and experimental evidence based on stock return including size, value, investment, profitability and momentum and the factor downside risk.

The third chapter consists of a research methodology (Fama Mcbeth,1973) procedure population, sample, and research model, data analysis software i. EViews software and statistical

tool such as multiple regression analysis. The methodology relies on two lanes. The first part includes time series analysis, and the second part includes cross section analysis. Chapter 4 consists of the main findings, discussions and derived conclusion based on the regression results. Chapter 5 consists of the conclusion, recommendations and last but not least, its limitations.

1.11 Research Gap

Although, some studies are conducted previously to test the downside risk based on CAPM (Iqbal & Brooks 2007; Rashid & Faiza, 2015; Usman *et al*, 2013) but none of them has been used to test the multifactor CAPM on the basis of downside risk with context to PSX. The current international evidence on the descriptive power of downside risk based CAPM is actually auspicious (Estrada, 2002; Olmo, 2007). This research tries to contribute to the downside risk based on multifactor capital asset pricing model in Pakistan. The present research investigates empirical validity of the hypothesis underlying the downside risk by using the multifactor model and establishing their efficacy in explanation of the cross section of stock returns in the PSE (Pakistan Stock Exchange) from the period of 2000 to 2015.

CHAPTER NO.2

LITERATURE REVIEW

2.1 Theoretical review

Different theories are discussed with respect to their origins and applications. This chapter is related to the literature review based on research of various authors and impact of market or various organizational factors on the return on equity. It also covers the theoretical reviews based on various theories and researchers. The secondary data on various stock exchanges of different countries are also reviewed in this chapter. The most important is the empirical study based on various theories that clear the relation among dependent and independent variables. The multi-factor asset pricing model is also part of this chapter that includes size, investment, profit margin, value and momentum and downside risks. Stock return or portfolio returns are dependent variable in this study and its valuation depends upon this multifactor model.

Alroaia et al. (2012) noted that the investors are concerned only about two factors in stock selection: one is risk and the other is return. To reduce the risk and increase return, market index is probably used to forecast the impact of various independent variables on equity return by the investors. The basic purpose is to minimize the risk and boost return on investment. The investor, thus, uses various market indicators to reach the higher targeted returns and predict risk and return analysis. Therefore, the aim of the investor is to obtain maximum returns along with security on investment in desired country stock and capital market. This is the only objective of the investor to maximize the profit. Investor's first priority is to maximize the profit margins. Therefore, it is important to find relation in portfolio return and various factors those are beneficial for the investors to boost their returns on equity and judge the portfolio along with risk reduction on the chosen investment. Strong and authentic evidence related to the average change in the returns and average performance in the CAPM model is not considered good. CAPM, sometimes neglect the stock upward and downward movements. There are limited studies that compare and contrast the ultimate performance of the average cost (CAPM) and pricing models in the downturn trend (Fama & French, 1993). Several studies and research on stock market returns have been conducted by various researches in the various stock markets in various countries. However, it helps not only the investors but also the companies to determine the main

factor that affects the return on investment and the value of corporate shares, respectively.

The basic aim of organizations is to improve the value of company in order to grab investors and make better fixed value in their obligations and responsibilities toward market "creditworthiness". It is also good for businesses, managers businesses, organization, business firm and investors for gaining their related goals. Managers and investors tried to acquire a high return by making investment in equities so that they would be more aware as they invest and take more interest in the factors that affect the return by scrutinizing their past market trend and correspondingly by examining the influence of the multi-factor asset pricing model such as size, value, investment, profitability, momentum and downside risks.

2.1.1 Modern Portfolio Theory

The latest portfolio theory created by the Markowitz's selection theory had been first explained in 1952 and William Sharp's contribution to the theory of basic asset price pricing was explained in 1964 and became familiar as the Asset Pricing Model Capitalism (CAPM) (Veneeya, 2006). The variance and standard deviations were the tools of measuring the capital asset risk. The modern portfolio theory is concerned with the investor decision for choosing an asset with less volatility and to the specific level of risk; the investor has to choose an asset with higher return. The standard deviation of the consolidated portfolio is less than the standard deviation of individual assets. Portfolio assets should not be selected solely on the basis of individual characteristics, but should consider how each asset moves in relation to other assets during portfolio formulation. Markowitz formed portfolio by keeping in mind the mean and variances of the stocks which construct the portfolio, by doing so efficient frontier was constructed. According to efficient frontier model the investor chooses those securities which provide maximum return for a giving level of risk and those securities whose risk is minimum for a giving level of return. Mainly, the modern portfolio theory gives a detailed framework for investment to choose and construct desired portfolio that must be based on increasing the returns and reducing the investment risk in current scenarios (Fabozzi, Gupta & Markowitz, 2002). In general, the risk component can be taken in modern portfolio theory, using different mathematical formulas, and reduced through a diversification concept based on selecting a weighted set of investment assets correctly which together show less risk factors than investing

in either individual or individual assets. Diversification is truly the basic concept of modern portfolio theory and directly depends on the traditional information of "not placing all your eggs in one basket" (Fabusi, Gupta & Markowitz, 2002; McClure, 2010).

2.1.1.1 Capital Asset Pricing Model (CAPM)

The structure, on which the CAPM is established in the modern portfolio theory, is very important to understand. The prediction model that estimates the excessive yield or return to risk free rate is presented by Sharp (1964) model. It predicts for a featured portfolio which can be based on the returned to a relation of risk free rate and beta in the underlying portfolio of market. The investor always expects to have compensation for the additional or excessive risks. CAPM explains that no portfolio can show a mix of risk-free assets and a current business market portfolio is based on the risk rate. The two most vital components in CAPM are return and ultimate risk. These can be estimated by using beta that is bounded or linked with variance like square root and standard deviation of the proceeds as an indicator of volatility. The most important point in this model is the division of risk into two elements: the risk of diversifiable (non-systematic) and the risk of non-diversifiable (methodological). When pricing an asset, systemic risk is important only because investors can reduce irregularity by increasing the number of securities in the portfolio.

2.1.1.2 Explanatory power of the three factors models

To address the CAPM challenge and the explanatory power of the other asset pricing model, Fama & French (1993) modeled three factors, which include market returns, volume of profitability and investment along with B/M factors. These factors show the average return over equity and other financial instruments like bonds. They used shares from the New York Mercantile Exchange, American Express, and NASDAQ from July 1963 to December 1991. It is calculated in a way that the excessive market profitability in monthly context market return minus the risk free rates in business market. The size factor is vitally calculated as SMB for small portfolio in which returns subtracts the return of larger scale portfolio for a business group. The factor of B/M ratio was taken as a return for the total B / M ratio, which grab the return of the low B/M group. The Fama & French (1993) methodology was based on advanced sequential

regression method of (Black, Jensen & Scholes, 1972). Monthly returns on financial stocks, instruments and bonds fall on market returns and mimic volume portfolios, B / M ratio, and time based risk factors on investment returns. There are two other issues why the regression approach uses the time series. One is based on pricing assets rationally, the variables are related to the average returns should be sensitive to the common risk factors in the returns. The other is that the clues in this regression series provide a simple measure of return and a formal test of the ability to capture the cross-section of the average return with a different mix of known factors. The Fama & French (1993) study encompasses two parts. First, size and B / M are in fact factors that are sensitive to the risk factors common to stock returns as they attract rigid variation in investment returns, regardless of anything in the decline of the time series. Second, the market factor and size and the B / M ratio have a good illustrative capacity on the cross-section of average stock returns.

2.1.1.3 Downside capital asset pricing model

Eric Bank (2011) The CAPM system makes a number of simple (and critical) assumptions for action. Two assumptions were open to criticism: 1) Portfolio revenues are distributed symmetrically around the average. 2) It is assumed that portfolio revenues have no external values (or "fat tails"). One is called the semi variant CAPM variant called D-CAPM (Downside-CAPM). The normal old trial version is changed by a beta-negative (β_D) experiment. Various researchers have provided changed technical definitions for β_D . Javier and Estrada: $\beta_D = \text{Negative variance between the change in asset portfolio and market} / \text{negative variance of the market portfolio}$. The main point is that the empirical studies depict that D-CAPM provides much better predictions than CAPM. The emerging markets specially focus on the calculation of CAPM and BD for investors. The assumptions are made on the return on investment from the emerging markets are always less natural and strongly deviant as compared to the markets return rate of developed economies. D-CAPM is highly regarded for its reasonableness, strong evidences and better usage of D-CAPM. Hogan and Warren (1974) expanded their work on lower risk techniques by creating a near-expected variance model, or the E-S model. They have developed the ES-CAPM model, which replaces the beta version of the trial version based on semi-variance differences and the identification of the common difference.

2.1.1.4 Multifactor capital asset pricing model (CAPM)

The CAPM is also expanded by Fama & French (2015) by adding more variables to the capital asset pricing model. The authors Fama & French provide the third factor structure or model by adding two factors of the size of non-market negative return (calculated by small cap firms that minus large value firms) and value (drives by book-to-market ratio) are useful factors when explaining a Cross-section of equity returns and further additions is done by Carhart (1997) in CAPM model by adding another factor called momentum. Fama & French added furthermore two factors named profitability and investment in capital asset pricing model.

2.1.1.5 Criticism on CAPM

As in modern financial theory, critics of CAPM assert that the assumptions are so restrictive that they invalidate their conclusions, especially the rationality of investors and the ideal and linear markets. Furthermore, the CAPM is a one-time model; based on estimates of risk-free rates, market returns and beta factors, which are said to be difficult to define in practice. Finally, the company assumes that investors will keep a diversified portfolio. So it ignores irregular risks, which may be of vital importance to investors who do not. Although there is evidence from Black (1993) indicating that CAPM does not work accurately for high or very low yield investments, which increases the yield required for the first and loses the desired return of the latter (suggesting non-formal risk compensation) · Validate CAPM for a wide range of beta values. It also retains the properties of individual beta returns for the portfolios. In fact, the experimental version of the portfolio appears to be more stable because the fluctuations between its components tend to cancel each other. There is strong evidence that the average change in average performance (CAPM) is bad. CAPM is the neglect of stock movements up and down. The concept of downside risks is considered an alternative. However, there are only a few studies that compare the performance of the change in the average cost and the pricing model under the landing.

2.1.2 Efficient Market Hypothesis

An effective market and stock based hypothesis shows that asset estimated and actual prices must show adequate market information (Damodaran, 2006). It drives the concept that rise

and fall in the asset prices resulted from the real market knowledge. It is also considered that the market is efficient and suitable to reflect the real data and information. In such scenarios, the investors should not expect larger profits. The unexpected or abnormal profit comes from excess returns in such market portfolio. An effective market hypothesis assumes that a large number of profits that increase the size of the market are involved in the analysis of market securities independently. Second, it is assumed that the signal of vital knowledge related to market securities shows the market in a random manner, declaring it independent. Therefore, profit raising investors adjust prices of securities quickly to show the impact of new market information. Vama (1970) divided the effective market into three types. These were weaker market hypothesis with low efficiency, strong market hypothesis, and lastly the medium market hypothesis. The market performance in terms of weak hypothesis depicts that the current financial stock shows entire information related to the market with the estimation that whether it will be in the best interest of the firm or not. It will also look at the favorability for shareholders. This also shows the past yield and ultimate prices have no link with the expected returns. The semi-strong market hypothesis in terms of form considers that market prices have been significantly set at the result of the release of all market information. As investors are interested to raise profit, they will quickly face arbitrage chances and show outcomes with best public information. The strong market hypothesis of strong form suggests that prices actually reflect all knowledge about private and public sources. Efficient market hypothesis gives favor to different researches that are based in the observed stock and financial market reactions along with the announcement of different signals for example as stock splits shown by (Fama & French, 1988). According to the Ball and Brown (1968) earnings and stock splits play vital part for all stakeholders of stock markets. The market activities are evaluated in context of effectiveness or enough market data. The adjustment of stock prices is made on latest information given by the event announcements. The evidence based security prices are normally expected to a better degree of consistency and return reliability. The effective tool of EMH is best for the financial research and studies. The economists are always reluctant to condemn the models and keep eye on better models for investments. The financial crises of 2007-2010 in international financial and stock markets don't prove the models' effectiveness. The investor tends to engage various techniques and tools in the crisis as they usually follow. The work paths are effectively adjusted by investors. According to Grantham, financial crisis always comes from the assumptions made by the financial leaders.

The leaders encounter weak areas and reduce the risks of financial and stock markets. The most famous financial journalists and correspondents are satisfied with the EMH approach. The outcomes of the annual conference of the International Securities Organization in June 2009 considered financial individuals and EMH most discussing issue. The EMH was strongly criticized. Ignoring theoretical investor and stakeholders as impractical with no actual data regarding markets working in real life, Fama was the creator of the EMH model. The scholar did not lose confidence in the model by looking at markets situation and crisis. The question is that why it did not so. More research may be needed, but a reliable hypothesis such as EMH is unlikely to be dismissed easily. The objective of stock splitting is boosted in the financing of modern companies. It is declared that it is a perfect tool to harmonize the common interests of the shareholders of the company and management at the same time. In stock, one share is divided into two or three called one for two and one for three. The number of shareholders in investment is increasing by 1 to 2 and 1 for three; however keeping the wealth same since stock prices are falling so that the balance of shareholders' equity in the balance sheet remains unchanged.

2.1.3 Random Walk Theory

The effective market hypothesis and hypothesis of random walking are consistent with each other. The assumption of random walking suggests that high and low stock prices do not hang on the appropriateness of providing data. Keeping portfolio of market in a manner that does not have an opportunity to earn any abnormal profit is the best strategy for investment. It is impossible to make a profit in the direction of stocks because it is not possible to predict changes or variations in prices of stock. The market responds fully to novel information, i.e. profits in turn are due to variance in share prices can either be negative or positive (Shleifer, 2000). The main concept in the theory is that if EMH is sustained, tomorrow's stock prices are only be influenced by tomorrow's news, data and information and are independent of today's price variation. On other hand, no one knows what will happen in near future, so the news cannot be predicted. If the news information is unpredictable, the predicted stock rate of returns will be unsystematic. This theory argued that stock prices look like to be wandering around randomly (Kendall, 1953). Some abnormal markets must be known to the investor. The effective market hypothesis has been questioned, especially after recognition of the qualitative shifts in the country's capital markets. A large part of the fundamental irregularities and inconsistencies

identified as "January Effect" are called. In this concept, it is certain that in achieving a higher average of stock and back where the confirmation of the highest return was archived in January that was seen by looking at various records and tracks in different months. This helps to estimate the effect of weekend; normally it is declared on Monday. The impact of the weekend was presented by the (French, 1980). French (1980) studies stock dividends every year from 1953 to 1977 and finds there is a tendency for profits to be negative on Monday; while they are not negative in the alternative days of the week. It also describes the idea of seasonal impact seen on some holidays in the entire country and prevailing in the country concerned. Fama and French (1995) found that business or market and volume consider profit to support to clear market and volume. Above and below the response of stock prices is to earn advertising. There is effective archived evidence about response with addition of income. It correctly hinted at as contradictions because they cannot be explained within the current global view of an effective market hypothesis. It unequivocally endorses that information in the market is accountable for affecting the price on both sides of the scale either positively or negatively, and the positive is called profit and negative is called "loss".

2.1.4 Behavioral Finance

Most Recent study in behavioral finance claims investors attitude of not looking at the highest returns and risk levels, as the portfolio theory explain and assumes. Oslen (1998) found that an investor needs consistency in return, so choose the decision processes that maintain future financial flexibility. Instead of maximizing the expected return, they want to increase the pathological strategy. It makes perfect sense that the practice of human and social psychology will pay deeper attention to understand the evolving attitude of the stock market and forecast the attitude of the stock and financial market. Market investors use such market data in order to predict there is an investment decision. The researcher recently makes attempt to describe the distortions in the stock market. Physiology literature gives evidence that individuals with limited knowledge of the of the stock market prove that unfair information about transactions make the chances of errors often depend on another view that the investor faces in the stock market. The idea of behavioral finance developed and control in the early 1990s linked with the Behavioral finance against the idea of market efficiency hypothesis based on perilous research and judgment and adopted the decision taken by contributors in the country's financial market. De Bondt and

Thaler (1995) evaluated the concept of behavioral finance and called it "simple, broad-minded funding". In 1990s the Behavioral finance concept was theme lined and began to emerge with opposing effective market hypothesis with governance-based research and decision making process for participants in the financial market. He disagrees with the notion of market efficiency and beyond.

Barberis and Thaler (2001) examines the hypothesis of ordinary utility, which is further clarification to avoid hazards, and cannot be envisaged only by giving examples of how the hypothesis cannot be true and misleading. It also requires a model that foresees a greater benefit decision by observing the concept in the responsible market and the deficit. It requires an exemplary model to portray the decision under conditions of weakness, openness to the social and market issue. Moreover, it is recommended that denying efficient market hypothesis because market does not rely on mental screens for people who are confronted by people while they perceive the concept of human psychology when they face a particular selection of chore. It is usually agreed that the dissatisfaction of the micro-utility hypothesis is the failure to recognize the mental criteria that govern the selection of duty. Knowing about the idea of human behavior and the mental capability in relation to the psychology gives greater and reliable system in stock markets. These are examined by the financial specialist along with stakeholders who conducts trading in the stock market. But it gives authentic and committed information about the investment and analyses the ideas of human behavior in context of mental psychology. Writing on mental brain science gives a promising system for judging the behavior of financial disciplines in the stock index system. By lowering down rigid doubts about the level of rotation in the normal model, it may be possible to visualize part of the stubborn anomalies. For a moment, the concept of the eruption can be predicted by discovering that subjects, when everything is said to be done, be predisposed towards novel data and oversee base rates. More researchers, the specialists often permit their selection to be directed by useless and unimportant and perspectives, a prodigy inspected under the heading "Morning and Rotation".

2.2 Review of Related Literature

After going through the literature, it was extracted that a changed researcher had conducted studies in the stock market in developing countries. The stock market in a country

differs from the other. Thus, the researcher found a negative, positive and neutral correlation between the multi-factor return and the return on equity, which is discussed one by one. The most important paper which describes the stock return, risk and downside risk from 1952 is presented by Markowitz when presented Modern Portfolio Theory, till 2015. The modern portfolio theory is developed by (Markowitz, 1952). Standard deviation and variance is used to measured risk of capital asset. According to modern portfolio theory an investor chose an asset with low variability for a giving level of return and an investor select an asset with bigger return for a giving level of risk.

Roy (1952) argues that investors are concerned about the risks of loses, or simply, disaster safety as the most important goal. Roy (1952) does not use the first safety rule in asset pricing until (Hogan & Warren, 1974) who count on variance with semi-variance as the first official version of capital risk on a downward basis. Markowitz (1959) raises the possibility that agents will be apprehensive about downside risks rather than market risks. It is recommended to build investment portfolios based on semi-differences, not on differences, as the differences between the differences in weight (gains) and downside risks (losses) are different. Markowitz (1959), the selected bag on the basis of semi-variance is more efficient than those selected on the basis of variance, when the yield distribution is perverted. However, for the distribution of normal returns, both variance and sub-variance choose the same active portfolio. Markowitz proposed below mean-semi-variance and below target-semi-variance as a measure of downside risk.

The Sharpe's (1964) Capital Asset Pricing (CAPM) model undertakes that the relation among risk and return is significantly linear and positive. The most imperative point in this model is the division of risk into two elements: the risk of diversity (non-systematic) and the risk of non-diversity (methodological). When valuing an asset, systemic risk is important only because investors can reduce the irregular order by increasing the number of securities in the portfolio.

A second pilot study was conducted by Jensen (1967) on a sample of mutual funds in 1945-1964. However, this study differs from the Sharpe study for two reasons: the first concerns the use of the trial version instead of the standard deviation, and the second relates to the

research objectives. In fact, Jensen studied the ability of fund managers to achieve higher returns than risk level. In other words, by examining excess returns, it indirectly checks the relationship inherent in the capital asset pricing model. During the reporting period, the author examined 115 joint funds that, on the one hand, confirmed the risk-return ratio; and secondly, the validity of the pilot as an appropriate measure of risk.

Sharpe and Cooper (1972) investigate all stocks listed in the US stock market from 1931 to 1967 and find that there is a linear relationship between risk and return. The sample is divided into 10 portfolios based on the risk category, measured by the trial version, where they conclude that the portfolios with the lowest beta issues are lower returns and vice versa for the higher risk portfolio. The correlation between the US stock return and book-to-market ratio was observed (Rosenberg *et al.*, 1985).

Black (1993) found that there was a positive linear relationship between the excess yield and the beta portfolio. If the proceeds are positively tilted, investors are willing to pay more for a chance to achieve higher returns. Krauss and Leitzenberger (1976) tested CAPM and found the same results as Black, Jensen and Scholes. Many studies have done to test the validity of CAPM in the stock markets of different countries. In order to study the CAPM and the dynamic form of CAPM, several relative studies are conducted by numerous authors to study CAPM. They took monthly returns of sixty five companies listed on the Amman Stock Exchange for 12 years from 2000 to 2011. The results of the study showed that the revenues expected by the CAPM police woman were more accurate (Ajlob *et al.*, 2013).

Historical research has shown that the P / BV ratio has caused fluctuations in the expected return on equities while anticipating stock prices. Change in price can be positive or negative that can result in profit or loss, respectively (Daniel & Titman, 1997).

Banz (1981) found that the portfolio of low-flow stocks outperformed large-cap portfolios. So investors should consider other risk factors along with beta. If small businesses give a bigger return, CAPM will face another blow. The researchers who support CAPM said that the small company has a large beta of major companies. However, the trial version is not enough to explain the completely different yield between uppercase and lowercase letters.

Another problem with CAPM was founded by (Rosenberg, Reid & Lenstein, 1985). The researchers found substantiation against CAPM demonstrating that a stock that has a high proportion of books to market has higher returns than stocks with a lower book-to-market ratio.

Nantel (1982) shows that previous negative beta values for US stocks are systematically different from normal beta cases. Specifically, the typical trial reduces the risk of low-trial stocks and increases the risk assessment of high beta stocks. This finding may help explain why the prices of low-priced beta stocks have fallen systematically and company stocks appear to be systematically high in the CAPM test. A positive relationship was found (Banz & Rolf, 1981; & Basu, 1997) between stock returns and the underlying index. An arrow that has a low price to a profitability ratio has a higher than average yield compared to those stocks that have a higher price-earnings ratio.

Levy and Lerman (1985) combine price with transaction costs to gain the influence of price-earnings on return on equity, found in lower-priced stocks higher returns, only when transaction costs are lower. The stock's performance was low to profit and the P / BV ratio was well on the market although all non-financial companies over the period of 1963 to 1990 were listed in NASA (Fama & French, 1992). The scholars also demonstrated that the relation between book-to-market ratio and equity returns is sturdier than the re-pricing ratio to the price ratio. The price to sale ratio is discussed in relation to stock returns and a positive relationship was found between the ratio of sales to price and future equity returns (Fisher, 1984).

Gul (1991) aimed to stimulate the role of downside beta in asset pricing under a rational representative agent. They investigate the significance of the relationship between the downside beta and the cross-section of current and future US equities and find that the higher sensitivity stocks of the bearish market movements also have higher average returns.

Fama and French (1992) found the relationship between beta and return was not correct due to a negative relationship between the size of the company and beta. They tested beta effects, size, leverage, E / P ratio and ratio to stock market in stocks on various US stocks. They scholars gathered data for the time period from 1963 to 1990 and resulted that the traditional relationship between return and risk returns by CAPM had futile to hold them. The scholars encompass all

the work that has been done over the last 30 years and is integrated into one model named as the Fama-French Three Factor Model. Fama & French (1993) presented two new variants along with beta. The size signified by the market value and the value signified by the book-to-market ratio.

Fama and French (1992) established a strong positive relationship with respect to stock return and the ratio of books to the market. Fama & French (1992) examined the volume of the book and the price in the stock market. It combines the value to find the average return of the inventory of browser segments linked to book-to-equity ratio, price-earnings ratio, volume, and leverage.

The price-earnings ratio has a significant impact on the return of shares reported by (Shaw, 1994). He studied Taiwan Stock Exchange stock and verified the board of directors' sample of the shares that made a positive profit listed on the Taiwan Stock Exchange. Davis (1994) conducted a huge 23-year study utilizing Moody's accounting data, concluding that the value premium was not distinctive at the time Fama and the French were researching.

Chen *et al.* (2015) explored the market multiples of United States and Japanese firms and there model constitutes. This was done by dividing the price to earnings ratio. The components such as market stock price to book value ratio and price to earnings ratio were judged by the volatility of stock price to book value ratio and price to earnings ratio. The author told that the investor needs to get further suggestions that the attitude of the volatility of the price to earnings and price to book ratio with the stock price volatility is needed for further research. The results further shown benefits for the market stakeholders: buyers and sellers of stock and of other financial instruments. It is also beneficial for the managers and executive officers in multi-national companies.

Chan, Jegadeesh and Lakonishok (1995) drive a strong conclusion on the survivorship bias thought process and bias which is exaggerated as a very small amount of the firms will hesitate to immediately follow market and maintain financial statements; thus rising book to market ratio. Third, Kothari, Shanken and Sloan (1995) explained the right usage of value weighted portfolios to establish the Fama-French factors greatly less concerned about survivorship bias. Another imperfection was seen by some scientists and researchers of the Three

Factor Model with the beta estimation.

Barber and Lyon (1997) also declared in their research that B/M and size risk factors always show stock returns and explain genetic aspects for the financial companies that are listed on the NYSE from 1973 to 1994 exactly like non-financial ones. Schuermann and Stiroh (2006) examined many pricing models by taking sample of bank stocks seen in 1997-2005 and concluded that market, B/M, and size risk factors are vital in explaining variations in stock returns.

The author Carhart (1997) wrote in an authentic article over the risk and return, which was published in the Journal of Finance. The paper opened up new dimensions by exploring new factor that was momentum anomaly to the F & F model. The author also introduced multi factor pricing model considered as an alternative to the previous model. Thus, the total factors of CAPM become four in number. The facts that the three factors model of Fama and French (1993, 1996) doesn't explain things that were found in the four factor model and alternative approach by (Carhart, 1997). The previous model presented in 1993 doesn't properly explain the yield and momentum effect presented by (Jegadeesh & Titman, 1993). Jegadeesh and Titman (1993) research work also elaborated the same concept. The creation and development of portfolio strategy is totally based on the estimations to purchase stock that has great return and low risk record in past and sell out the stock with low performance and greater risk. Investors generate the positive returns over 3 to 12month time period. Only few stories have given declaration about the power and adding momentum factor to SMB and HML factors of F & F model along with (WML-winners minus losers) in describing the stock returns (Carhart, 1997; Jegadeesh, 2000; L'Her, Masmoudi & Suret, 2004; Bello, 2007; Unlu, 2012).

Chui and Wei (1998) opened new things by examining the Asia-pacific region stock markets and five major emerging capital markets. They used three factor models and consider it more trustworthy and effective in cross-sectional stock returns. The authors also explored the degree of correlation in average stock returns and the BE/ME ratio in those countries that was closely linked with the average BE/ME of that country. Fama and French (1998) again tried to explore relation in price to earnings ratio and stock return volatility. The authors' break up the yield and price to earnings ratio that was directly used in the forecast and prediction of stock

returns.

Dhatti *et al.* (1999) show clear relation among the stock returns and potential explanatory factors in Korea. The Korean market gives stock return according to the book value by linking it to the market value ratio. The equity and sales with the price ratio are not considered vitally related to the market value. The negative relation of the market value and the equity are estimated in a stock listed section. Three variables along with the Book to market ratio has largely depicted the explanatory power of financial returns.

Estrada (2000) argued that by taking the ratios of the semi deviations of the asset into account along with market to see the systematic downside risk. This measure of risk was empirical helps to explain the variations and differences in the cross section of stock returns in growing markets, industries and online stocks. Estrada (2002) told about the mean-semi-variance behavior hypothesis and give empirical references for the downside CAPM (D-CAPM). Harvey (2000) explored the supremacy of lowering down trend for emerging markets by taking a sample based on equilibrium and non-equilibrium-based risk measures.

Aleati, Gottardo and Murgia (2000) investigated the Italian stock market during the period 1981-1993 through the modified Three Factor Model to include other macroeconomic variables such as the change in interest rates and the default premium, and found that the relationship between beta and stock return is robust. The size and stock return are important aspects of the stock market based on the estimation methodology. Tseng (1988) showed that the entire portfolio established have low price when looked from the perspective of earnings ratio stock. The peak level adjustment returns are added in the portfolio that has greater prices toward earnings ratio. The minimum prices to the earning stock definitely have greater returns for the greater earnings ratio (Good & Peapy, 1986).

Stulz (1995) research was cited by the study of Estrada (2000) and estimate that the needed return in complete integrated markets is perfectly measured by beta. On the other hand, in emerging market, it is considered as divided into various segments along with the standard deviation appropriation. Thus, the use and implementation of a local CAPM in segmented markets is surely appropriate in the global CAPM. It is also applied in all type of fully integrated

markets. The author concluded that the research is stated by the semi deviation that can be applied at the country. The factors are examined at company level.

Ang et al. (2001) analyzed the explanatory power of downside risk based risk measure to explain momentum effect using daily U.S. stock data from January 1964 to December 1999. The time period taken was from January to December. The time from 1964-1999 was very important due to high variation in stock and returns. The authors found that average return on the stocks are linked with the higher downturn in the risk. The risk factor greater than the 6.5% per annum rate over the average returns of the stocks with the lowest downside risk neutralizes the effect of market beta, the size effect, and the value impact. It is also estimated that the returns in context of momentum strategy can partly be described by the Upper level exposure to lower risk. On the other hand, the investors failed to know any noticeable and clear pattern in the expected returns of stocks. This was seen when ranked by third-order moments (Rubinstein, 1973). Nicholson (1960) worked on the stock of the United States market. The author had drawn reverse relationship among the price to earnings ratio and stock return by taking the United States stock market.

Faff (2001) carried out a research that focused on the monthly data for twenty four Australian industries. The period selected was among 1991-1999. His basic research revealed the validity of the Fama and French model based on three factors. The basic theme was to generalize the moments in GMM test. The author shows the period used as a sample uses the GMM test gives a rigid support of F & F model of three factors. The author looked at the negative consequences with size and portfolios relation with the rate of return. The small or medium size Australian industries give average rate of return. They never exceed the profits of larger firms. This also depicts the relation in risk premium and return on the stock. The positive influence is seen in the boom to market equity.

Shefrin (2001) declared the stock returns that are positively and directly correlated to the price and to book value. It is directly reported by the larger firms that have extremely low book value and the newly born firms that have high book value. On the other hand, the ratio of the price and the book value is judged according to the firm earning capacity and profit price return. According to the study of Go, Graham and Harvey (2001) clearly 73.5% of 392 CFOs, managers

and executives use CAPM. This happened when the cost of the assets and property rights are estimated. One more research of Brunnen, Abby and Codyk (2004) declared the same thing by taking two hundred and thirteen European financial heads. More than 43% of the financial heads told that we can leave some points in CAPM. The research was based in the fifty years older model and gave totally unique results. The time period depicted complete and sophisticated calculation about various areas of stock markets and pricing models. Some questions are raised about investors and their terrific understanding about the funds using the CAPM. According to me, the executives always know about the right and wrong usage of the CAMP. They gave lots of reasons for selecting the Fama and French model. There are many options existing about the three factor model and its complicity. The returns are collected by using the data and information. It is easier for the CEO of the company to use the three factor model for better performance and profitability of the company. L (2005) utilized the various solutions that show the portfolio groups based on three factor model, but in different time periods.

The three factors model gives publicity to the work of various authors and researchers that have examined various markets. Griffin (2002) showed that three factor model is performed on countrywide. Everything is seen in the global scenarios. The author took 1521 Japanese companies, 1,234 British firms and 631 Canadian firms with monthly average returns. The time period for collection of data was taken from 1981 to 1995. The author controlled the three factor model in local and international stock market context. The results reported R^2 rate at international model by 0.904 that was raised from 0.006 greater than the domestic model. The error in the pricing of global model was 0.24 that was comparatively greater than 0.22.

Ang, Chen and Xing (2002) studied the downside risk on the New York Stock Exchange and concluded that the previous bearish side is a good indicator of future change as the market moves down. Ange *et al.* (2006) reported a 6% risk premium for risk of decline and concluded that the average returns were higher on equities closely linked to the market in recessions. Another notable contribution to negative risk theory came from Estrada (2000).

Trevino and Roberson (2002) evaluated the United States stock market and concluded the influence of price is profit ratio from the stock profit returns. The outcomes are seen in the context of correlation in the price and profit margins, the short term equity and profits. These

outcomes are beneficial for concluding the long term stock returns.

Additionally, Lam (2002) evaluated the strong relation in the stock return and the standard benchmark of shares, the level of volume, book to equity and the leverage, book to equity and earnings to price ratio. It was extension of Fama and French model given in 1992 in the Hong Kong stock and financial market. The scholar recommended that the outcomes of this study were not determined by unusual return or extreme observation behavior for few months or by size.

Lau *et al.* (2003) examined the relation between stock returns and beta, the volume of book ratio to the stock market, sales growth, profit rate ratio, cash flow to price ratio. The scholars found anomalies in the emerging markets of Malaysia and Singapore over the time period of 1988-1996. The researchers further reported an uncertain relationship between beta earnings and returns in the two countries. Throughout the months with a positive return on the positive market, there has been a significant positive relationship. It was also reported that a negative correlation between beta returns and returns if the market confronted negative signals. They have had a negative impact on the returns on the size of both countries. In addition, the scholars reported a negative association among revenue and sales growth in Singapore; whereas, they found a positive association among yield and price-earnings ratio in Malaysia.

Drew and Veeraraghavan (2003) utilized four emerging Asian markets in Hong Kong, Korea, Malaysia and the Philippines from 1991 to 1999 to study the ability of the Fama& French three factor model for explaining the change in the average rate of return rate. The scholars resulted that three factors have a higher force in interpreting the average return on equity in all four countries.

Drew, Newton and Verarajhavan (2003) suggested that if investors in China chose a mix of small and low-volume books to market equity firms and market portfolio 13, they would generate high risk-adjusted returns. This is an indirect hint shows Chinese investors to follow the French Fama volume and B / M ratio factor in order to generate superior revenue. It also indicates that B / M ratio operates in the Chinese stock market. The trace period for the sample is from December 1993 to December 2000. First, the trace period is shorter compared to many

other similar studies. Second, the Chinese stock exchange was not long established. The market was not mature at the time. All of these effects may be affected on the outcome. Drew et al. (2003) used the 1 year deposit rate in China as a risk-free rate of return. In their research, they not only tested the French-French model of the three factors, but also tested the effect of January and the Chinese New Year by adding seasonal factors. They created a phantom variable for the January effect and one for the New Chinese Year effect. According to its findings, small and developing companies generate high returns in China. This means that the impact of value is not as widespread as it is found in the US portfolio and other international markets. This may be very important to our results.

Using the daily data from the Australian stock market (Faff, 2001) provides a test of the FF model for three factors. Using a sample from the industry, results show that FF provides an appropriate risk premium assessment. The results also suggest that the three factor model is still better than CAPM in interpreting the rate of return. Other studies have tested the health of asset pricing models in emerging markets.

Wang and Xu (2004) used each A share from July 1996 to June 2002 as a sample. They found that the price-to-market coefficient is not useful in interpreting stock returns while the volume factor is still working. Their methodology was to change the B / M factor to a free float factor. Because it tested the B / M coefficient was not statistically significant in all models but the free float factor is. In their views, free float would affect the future cash flow of the company, which is in turn a better agent for the growth potential of Chinese companies and investment opportunities. According to Wang and Xu results, the average R² rate is the regression of the time series including market factor, factor size, and free float factor is 0.90. The reason for the B / M rate factor not working in China was that most Chinese investors were looking for short-term gains, in another word, speculative. Thus, the average volume and trading rate was abnormal in the Chinese stock market. The B / M rate was useless in capturing cross-sectional differences in stock returns.

Damodaran (2007) reported that high-growth companies would have a higher price-to-earnings ratio than the low growth index. The proportion of firms will be reduced to companies that are more risky than low-risk companies. The company will have lower ROI needs with a

higher rate of profit than the company with higher reinvestment rates. However, it also states that it is difficult to stick to other things as high-growth companies tend to risk high rates of reinvestment.

Lam (2005) found a different solution by testing a different portfolio over different time periods. The FAM-FRANCE model was not always a better choice than CAPM. Malin and Verarajhavan (2004) tested a Fama-French model in different countries. They found that the impact of small businesses in France, Germany and the impact of large companies in the Kingdom, but not much more. Al-Mwalla and Karasne (2012) tested the effectiveness of the Fama & French three factor model by taking data from the period from 1999 to 2010 on shares listed on the Amman Stock Exchange (ASE); the researchers found that Fama & French three factor Explains better the differences in portfolio revenue from CAPM. After the Fama & French research was published, a discussion was created for several years. Many of the researcher ideas for many years to criticize the model and try to find different ways to improve the model more.

Petkova (2006) used the monthly data from July 1963 to December 2001, realizing the ability of the Fama & French three factor model to capture the investment opportunity that appears on the stock markets. For more specifications, both SMB and HML provide an outstanding prediction to Market returns and changes in this yield Both employees are closely associated with this opportunity and provide a better explanation for the change in the time series of the return on equity, but not on the multispectral return. He concluded that the Capital Asset Pricing Model between the two countries (ICAPM) developed by Merton (1973) provides a better interpretation of the cross-sections than the Fama model and the French three for its specific model and model.

Iqbal and Brooks (2007) analyzed the data for the period from 1999 to 2005 as evidence that investors are asking for a premium on negative deviation. Consequently, falling prices are priced on the Kuwait Stock Exchange. Investors do not like negative risk and do not give equal weight to both upside and downside risks as assumed by CAPM. Abbas et al. (2011) also found experimental support for D-CAPM using data during the sample period from January 1997 to December 2004 covering shares listed in the UK and France. The alternative specification for CAPM, downside risk, assumes the CAPM behavior of the average semi-variance (MSB) by

investors and assumes that investors give greater weight to the deviations without the target rate of return deviations above the return target. Therefore, stocks that are positively related to the market in downturns should require a higher risk premium than market-linked stocks.

Weigand and Irons (2007) assessed the stock market of United States and carried out research on the data over the period of ten years. They examined the ratio of market price to profit ratio and its association to future return on equity, interest rates and total profits in the United States' stock market. The scholars expected real equity returns for 10 years on the basis of market earning rate (E / P ratio or P / E ratio) and found that their forecasts were not up to par of those in other situations.

Fama and French (2008) carried out another research by looking at other anomalies. The scholars found that the problems of net stocks, receivables and momentum had a more significant impact; however, profitability and asset growth were less robust. They conclude that all anomalies have received some sort of positive result. Lam et al. (2009) test the strength of the four factor model to elucidate the change in stock returns in the market of Hong Kong. The results of the study showed that this model was important and applicable in the Hong Kong market. unlu (2013) tested a four factor model in the ISE (Istanbul Stock Exchange) for the period from July 1992 to June 2008. The results of the study showed that the four factor model was significant for ISE.

Bello (2005) conducted a statistical assessment between the three-factor model, the four-factor model and the CAPM. He utilized mutual funds being data for the assessment of the models rather than using stocks. The scholar conducted in-depth analysis on the probable multi-co linearity delinquents that can occur when carrying out regression tests. The outcomes revealed absence of multi-co linearity in the data. The scholar also performed test for goodness fit. The results showed insignificant fit difference. However the prediction quality shows that the performance of three-factor model is better than that of the CAPM model. In addition to it, the performance of four-factor model is better than that of three-factor model.

Viale *et al.* (2009) conducted TFM, ICAPM (inter temporal capital asset pricing model) and CAPM test. The data was collected on US financial firms for the time period from 1986 to

2003. The outcomes of the study revealed that the most effective model is ICAPM, the improvement of CAPM is not significant with the help of TFM and the value premium is an improved predictor in comparison to size premium.

Ayube *et al.* study (2011) shows that the DCAPM model based on negative risk is a better alternative to CAPM Capital Asset Pricing Model. It effectively covers all the characteristics of the capital asset pricing model, but allows it to move to the assumption of normalcy and the willingness of shareholders in both upside and downside risks.

Tripathi (2011) studied on the Indian stock exchange from a ten-year database. He noted that the relationship between the underlying factors of the Association and its valuable returns was also in the Indian market. Information on an example of 455 companies registered in the Indian stock market aimed at June 1997 to June 2007 was supposed to examine the relationship between the underlying factors of poor organizations such as capitalization announcement, cost of cost of income, book value to market value ratio and commitment to value ratio With value returns. A negative correlation was found to capitalization in the market and the cost of profit to profit with the return value. The profit ended from reading his book to the market value and the ratio of debt directly linked to the return on equity in the stock market.

Fun and Basana (2011) achieved the Indonesian bourse and resulted that a stock with a low price to profit ratio is seen a cheaper price and is anticipated to produce a higher return in the next period. This research is a medium to check with a high price to profit ratio charted by a low return on equity and vice versa. This paper used sample of 45 stocks from the Indonesian Stock Exchange for the period of 2005 to 2010. The re-examination revealed that there is a substantial difference among the low price and the profit and the high price of earning with short-term portfolio yield (six-month holding period); however, there is no significant difference if kept for one to four years. The result gives an indication for an investor to make investment in low-priced stocks for a short (six month) time horizon for achieving interest (take profit).

In Pakistan, various researchers are testing asset pricing models. Mohammed *et al.* (2012) tested the non-standard type of CAPM using a sample of 20 selected companies from various sectors listed on the Kuwait Stock Exchange. The result of the study shows that the stock market

in Pakistan is volatile where mixed results were found.

Artavains and Kadlec (2012) also obtained empirical evidence of the capital asset pricing model (CAPM) and risk through comprehensive stock data in France and the United Kingdom for the period of 1997 to 2004. The outcomes of the research on the capital asset pricing model (CAPM), i.e. Risks that are positively related with the market compared to market-related stocks.

Akbar *et al.* (2012) have achieved the experimental validity of DCAPM in the Pakistani stock market. In order to attain the set objective, a sample of 313 shares listed on the Karachi Stock Exchange (KSE) was analyzed during the period from July 2000 to June 2011. The outcomes show that there is no large empirical evidence of complete time periods and sub-samples to confirm the risk-based capital asset pricing model (CAPM) on the KSE.

Lin, Wang and Cai (2012) carried out their research with SHSE data. The scholars demonstrated that Fama-French agents are worthy agents for risk factor assessment of portfolio. It suggests that Fama-French factors are typically representative of the risk premium in the stock market of China. The 12th tracking time for Lin, Wang and Cai is January 2000 - December 2009. It has built hundred investment portfolios but just used 237 individual shares. The scholars utilized method to estimate risk factors of portfolio revenue by key constituents. Far ahead, compare the market factor, the size factor, and the B / M factor with the projected risk factors to assess the appropriateness of the use of these three factors for risk factors. The scholars resulted all three factors as good agents for portfolio risk factors. On the other hand, the mere market factor is a good agent for the individual stock risk factor. This research study is carried out on a longer period of track with much greater research sample. My results may conflict with their results.

Masood *et al.* (2012) conducted a study to verify the unconditional form of CAPM in the Pakistani stock market by utilizing the daily returns of twenty companies for 14 months (from the time period of December 2008 to February 2010). The outcomes supported the CAPM model and did not offer any substantiation to sustain another model. Sun (2012) investigated the price-earnings ratio, price-to-book ratio and the impact of company size in the context of Australian. Initial results indicate that price - earnings ratios and the size of the company do not have the

ability to predict the return of stocks. However, significant returns were found to be associated with the price-to-book ratio. In addition to it, Meng and Joe (2013) discovered that three factor model has a worthy explanatory power on the A-share market on the Shanghai Stock Exchange. This study did not include financial stocks, ST stocks (stocks with special treatment, which specify that risk is higher as compared to normal stocks) and large-value companies to preclude large and high volatility of the over-conserving effect.

Paul and Asarebaa (2013) researched CAPM in Indian listed companies (NSE) and discovered this study provides evidence supporting CAPM and proved the theory that high risk leads to high returns. Over time, CAPM has been subjected to condemnation. The first study that provided a diverse answer to CAPM was done by (Basu, 1977). The scholar (Basu, 1977) established that along with the size of the beta and the proportion of P / E also influence on the stock returns. This research resulted that stocks having low P / E ratios outclassed those stocks having high P / E ratios. Rahman and Javed (2013) also researched on the relation between risk and return in the Pakistan stock market for assessing the return on equity. In order to attain this purpose, they gathered monthly data for the period of five years starting from 2003 and ending to 2007. The results of this research reveal that the CAPM mechanism is effective on the Karachi Stock Exchange (KSE) as it gives better approximation of investors' returns.

Madiha and Abu Bakr (2014) study a comparison of the predictive forces of 2 asset pricing prices: the CAPM model and the factor of seven risk rate return factors, to explain the cross-section of earnings in the financial firms listed on the Karachi Stock Exchange. The tested model results indicate that the models are valid and applicable in the Pakistani financial market. The upcoming literature will look at downside beta now.

Liu *et al.* (2012) proposed a new model to test capital asset pricing theory empirically. The maximum probability estimation method is used. LR and Kolmogorov-Smirnov (KS) are used to perform the typical diagnosis. The Akaike Information Standard (AIC) is used to compare the model. The simulation results show a valid MatLab program. Experimental results show with unusual errors and EGARCH type fluctuations, and the CAPM theory is not alive. This new model can capture skewness, asymmetric effects, and volatilities in data. This new model has the best in the sample of others. Smaller sized folders contain a larger experimental

value.

The following year, the results of Xu and Zhang (2014) also sustained this idea. The scholars concluded that the working of B / P is better in a three-factor model as compared to that in BE / ME. The period of tracking utilized by Xu & Zhang is 1991 - 2011. Twenty years are very long in comparison to the short time period of the stock market of China. In contrast to it, innovation is utilizing B / P rather than B / M because Chinese companies are listed on various exchanges for instance A-shares on the mainland, H-shares in Hong Kong, and N-shares in New York. In this regard, they considered it was not precise to assess the ratio of B / M. Moreover, the Council of Small and Medium Enterprises (SEB) and the Board of Growth Projects (GEB) 11 were established on the Shenzhen Stock Exchange. Hence, they tested two samples in the Fama-French triangular model. Among which, one includes shares SEB and GEB and one does not include.

Furthermore, Gan, Hu, Liu & Li (2015) utilized data from the time period of 1996 to 2005 to contrast the above-mentioned results that the volume factor was adversely associated with return on equity. They utilized the A-share data starting from January 1996 ending to December 2005. The risk-free rate of interest was the rate of fixed deposit for the 1st month of each year.

In addition to it, Jean *et al.* (2015) assessed three model factors and a CAPM. The outcomes showed that the average return of the high B / M portfolio was 0.004 and that the average return of the low B / M portfolio was low -0.003. This shows that the portfolio stock B / M is greater than the average return of the low B / M stock portfolio. Not only the average return, but also the average deviation of the high B / M portfolio is 0.0038 less than that of the low B / M portfolio. On the basis of these results, it has established the size and effects of B / M ratio present in the Chinese stock market. On the other hand, the modified R^2 of their result is 0.4195, which is less than one of (French & Fama, 1993). Hence, they came to the supposition that the explanatory power of the three factor model is less effective in the Chinese stock market in comparison to the US market.

Fama and French (2015) established a five-factor model on the basis of their three-factor

model. They found that the mean return on equity could be better enlightened by the addition of two other factors: i.e. investment and operating profitability. The period of tracking is from July 1963 to December 2013 that is a period of 264 months longer than the trace period for the 1993 study. It can influence the comparison of outcomes in these two researches. However, the sample is actually similar from all NYSE and USEX stocks and NASDAQ markets. The approach the FAMA is constructed and the French market factor and factor size and value factor is similar. In contrast to it, they assessed operating profitability in a manner that subtracts revenues from the cost of goods sold, sales and general expenses and administrative expenses, and subtracts interest expense divided by equity. The measurement of asset is a change in total assets from the financial year lasting in year $t - 2$ to the financial year lasting $t - 1$, divided by the total $T - 2$.

Rasheed and Hamad (2015) use monthly data to close stock prices listed on the Karachi Stock Exchange (KSE). This research data covers the time period starting from January 2000 to December 2012. The standard value, the downside and the rising beta are calculated for various sub-periods and are then validated to measure the premium of risk for the ensuing sub-stages of the cross-sector regression. The results compared the risk to the downside and risks rising in the single equation, that equities that vary with the market decline are compensated with a positive premium to bear downside risks. However, the stocks risk premium is negatively associated with lower market returns is negative for all sterile triplet operations in all sub-periods examined.

Chen, Hu, Shao and Wang (2015) found that there is no strong impact on the value of the Chinese stock market using a three-factor model utilizing data from July 1997 to December 2013. As per their research, the strong resulted from a few risky months before 1997. The HML factor may not work in our five factor model as well. Chen et al. All shares of SHSE and SZSE were extracted as a research sample. They used regression factors for the three Fama-French model, and broke down the slopes of FamaMacbeth. The three factors performed the regression model splendidly in seizing the cross-sectional differences in the average yield on portfolios. Though, three factors played diverse roles in this. The utmost imperative factor they deduced in the time regression series was the size factor. In contrast to many other studies, the B / M modulus factor was weak in interpreting cross-sectional differences in mean return.

Ghaeli (2017) identified the P / E ratio is one among the fundamental instruments for

asset valuation in the stock market before investing in equity or portfolio return. It is the simplest way of others, widespread among a lot of investors to decisions related to buy and sell. This research reviewed some studies on the relation between price to earnings ratio and Trac performance, estimating data of transaction, internal transactions, future growth, size of the company, investor ratio and writers to shareholders' equity. The scholar recommended that the change in price-earnings ratio should have some sort of predictive power. Thus, the research model recommended and also pronounced a large part of the variation in the ratio of earnings to price. The prospect direction of the gain-to-price ratio was predicted, specifically when the change in profit-to-price change was significant or gave a steady signal in a quarter.

2.3 Empirical Evidence

However, a review of the literature indicates that there had been few studies to test CAPM based on the downside risk (Iqbal Brooks, 2007; Usman *et al.*, 2013; Rashid & Fayaz, 2015) but did not put any study to test an experimental CAPIF multifactor under downside risks In the Pakistani stock market. Contemporary international substantiation of explanatory power to cover downside effects is promising (eg, Estrada, 2002; Olmo, 2007). The contribution of this study towards literature is based on the multifactor model on negative risks in the context of Pakistan. This study examines the validity of the experiment from the underlying assumptions of the downside risk using the Multifactor model and demonstrates its usefulness in explaining the cross-section of stock returns in the Pakistani stock market i.e. PSE (Pakistan Stock Exchange).

2.4 Positive Association

There is a positive correlation in numerous past studies among stock returns and the CAPM model. The following author discusses one by one examining the direct or positive correlation of the return of shares with the CAPM model. Black (1993) found that there was a positive linear relationship between the excess yield and the beta portfolio. If the proceeds are positively tilted, investors are willing to pay more for a chance to achieve higher returns. Krauss and Leitzenberger (1976) tested CAPM and resulted similar results as found by Black, Jensen and Scholes. The scholars undertook monthly returns of 65 companies listed on the Amman

Stock Exchange for 12 years from 2000 to 2011. The results of the study showed that the revenues expected by the CAPM policewoman were more accurate

Rahman *et al.* (2013) aimed to study the relationship between risk and return in the Pakistan stock market to assess the return on equity. In this regard, they gathered monthly data over the passage of 5 years starting from 2003 - 2007. This study resulted that CAPM is effective at PSE (Pakistan Stock Exchange) since it gives better approximation to investors of return. Paul and Asarebaa (2013) studied CAPM in Indian listed companies (NSE) and discovered this study provides evidence supporting CAPM and proved the theory that high risk leads to high returns. Over time, the CAPM system has been criticized. The first study that provided an altered answer to CAPM was done by (Basu, 1977; Basu, 1977) resulted that along with the size of the beta and the proportion of P / E also influence the stock returns. He established that stocks having low P / E ratios outstripped stocks having high P / E ratios.

2.5 Negative Association

There is a negative correlation in many previous studies between stock returns and the CAPM model. The following author discusses one by one examining the direct or positive correlation of the return of shares with the CAPM model. Banz (1981) and again Bassu (1983) found that the portfolio of low-flow stocks outperformed large-cap portfolios. So investors should consider other risk factors along with beta. If small businesses give a bigger return, CAPM will face another blow. Another problem of CAPM was originated by (Rosenberg, Reid & Lenstein, 1985). The researchers established evidence against CAPM by demonstrating that a stock that has a high proportion of books to market has higher returns than stocks with a lower book-to-market ratio. Fama and the French (1992) discovered that the relationship between beta and return was not correct due to a negative relationship between the size of the company and beta. They tested beta effects, size, E / P ratio, leverage, and ratio to stock market in stocks on various US stocks. The scholars gathered the data for the period from 1963 to 1990 and resulted that the traditional relationship between return and risk returns by CAPM had abortive to hold them. This paper covers all the work that has been done over the last 30 years and is integrated into one model known as the Fama-French Three Factor Model. Fama and French (1993) introduced two new variants along with beta. The size signified by the market value and the

value denoted by the book-to-market ratio.

2.6 No Association

Literature also reinforced the point that there is no relation between stock returns and risk factors that are subject to a particular market prevailing in certain economies, either under development, developed or developing. The significant change in the capital asset pricing model does not reflect the large change in equity returns. There is neither positive nor negative relation between risk factors for instance price-to-sales ratio, price to earnings ratio and price-to-book ratio. The following two researchers are discoursed one after the other, who assessed the association of none or found absence of relationship between market risk factors and stock return. Erdogan (2000) Study and examine the results of the stock market gained. Their research revealed that there is little or no correlation between equity returns with the price-earnings ratio and stock returns with the book value ratio. If there is a massive variation in price to the book value ratio and the price-earnings ratio, the smaller the company's future returns.

Tripathi & Seth (2014) examined 445 companies listed on the Indian stock market over the period of 1997 to 2007. There is a negative relation among price-earnings ratio and return on equity. Return on equity has a negative influence on market value and price-earnings ratio.

2.7 Summary

Based on a research study, the study concluded that this study includes capital assets of multi-asset capital (CAPM) The impact of the pricing model on stock returns in the financial and non-financial sectors. Contemporary international substantiation of explanatory power to cover downside effects is promising (Estrada, 2002; Olmo, 2007). The contribution of this study towards literature is based on the multifactor model on negative risks in the context of Pakistan.

Many studies have been conducted to examine CAPM for its experimental validity. The outcomes of studies conducted by (Black *et al.*, 1972; Pharma, 1988; Srinivasan, 1988; Itzazand Attia, 2008; Rahman and Javeed, 2013) show that CAPM hold means there is linear and positive relation among risk and return. DCAPM (Rasheed & Faiza, 2015; Usman *et al.*, 2013; Akbar *et al.*, 2012) on the Karachi Stock Exchange, but the combined effect of a multifactor on the PSE

has not been tested yet. Critic criticizes different CAPM model. Studies that gave a different answer to CAPM were conducted by (Basu, 1977; Banz, 1981; Bhandari, 1988; Fama & French 1992; Groenewold & Fraser, 1997; Gomez & Zapatro, 2003). To the beta size and book ratio to the market also affect the stock returns. A number of studies found that the variance in average security returns could not be explained by the beta market alone, and showed that basic variables such as size (Pans, 1981) macroeconomic variables and price-earnings ratio (Paso, 1983) The market (Reid *et al.*, 1985; Chan *et al.*,1991) represents a large part of the change in expected returns. Future researchers may change the model with regard to the future market situation and the prevailing economic situation in the country. The limitation of this study is to the collect data for the time period specified. This study results are also limited to the Pakistan Stock Exchange.

CHAPTER NO.3

RESEACRH METHODOLOGY

3.1 Research Design and methodology

Pakistan Stock Exchange website is used for the collection of desired data required for this research from the 2000 to 2015. Data from annual publications and annual reports of State Bank of Pakistan and Pakistan Stock Exchange has been taken on the study variables of this research. Data of listed companies is obtained through their annual reports from their websites. Other important daily financial information about closing and opening prices of stocks in order to calculate the returns is also taken from PSE website. Data for the independent variables named book value of companies, market equity, total assets, profitability and investment is gathered from the annual audited reports from the PSE data portal and overall listed companies. For momentum portfolios, the stocks are classified as winners and losers is done on the basis of their momentum returns at the end of month. The momentum returns at the end of month t is the 11 month returns from the end of month $t-12$ to $t-1$.

Past studies were conducted on the selected companies from multiples countries around the world. This research contributes into the past studies in three aspects. Firstly, this study is specifically based on the companies of Pakistan stock exchange. Secondly, the firms are not same in each variable required data for all time period in all years. Thirdly, each year in selected time period from 2000 to 2015 have different number of companies regarding data.

3.2 Population

The companies listed on the Pakistan Stock Exchange either non-financial or financial sector are selected as population for this study. Approximately, 578 companies of financial and

non-financial sector are registered with the Pakistan Stock Exchange and become population of this study.

3.3 Sample Technique

The study used convenience sampling technique. All those listed companies whose data is available in Pakistan Stock Exchange are used as sample from 2000 to 2015. Convenience sampling technique is used on the basis of availability of data of study variables. Pakistan Stock Exchange is an important emerging market which shows specific characteristic of high price volatility and high turnover. Thirty portfolios of companies return are made for analyzing the results.

3.4 Unit of analysis

Any single company may be taken as a unit of analysis either is financial or non-financial sector, which is listed in Pakistan Stock Exchange from the time period 2000 to 2015.

3.5 Sample Size

Almost 578 firms are listed in Pakistan Stock Exchange. The sample size is depending on availability of variables data of listed firms and it varies from year to year.

3.6 Data Collection method

In this quantitative study, the secondary time series data of all variables from 2000 to 2015 is used for conducting this research. Thirty portfolio of stocks return are made for dependent variable. To calculate the monthly returns, the closing prices are taken from the authorized website of PSE. To validate result, we use monthly return as used by earlier studies of (Fama & MacBeth, 1973; Fama & French, 1992).

To calculate the market and book value of firm, total assets of the firm, earning per share the audited annual report of firms, Pakistan Stock Exchange annual reports of firms and Pakistan Stock Exchange data portal are used. To calculate the monthly returns of stocks, the following formula is used.

$$R_{jt} = \ln(P_{jt}/P_{jt-1}) \dots \dots \dots (1)$$

Where R_{jt} is the return of stock j at the month t . P_{jt} is the closing price index of the stock j at month t . P_{jt-1} is the closing price index of the stock j at month $t-1$. PSE-100 index is used as proxy to calculate the monthly return. By using above equation, market return is calculated. 12 months treasury bills rate as a proxy for risk free return used which has taken from the websites of State Bank of Pakistan.

3.7 Model of the Study

In this study, multiple regression model uses following equation.

$$R_p = a_i + \beta_1^D (R_M - R_F) + \beta_2 \text{SMB} + \beta_3 \text{HML} + \beta_4 \text{RMW} + \beta_5 \text{CMA} + \beta_6 \text{WML} + \text{eit} \dots \dots (2)$$

The equation:

- $\beta_1^D, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the coefficient for size (SMB), downside risk (DR), momentum (WML), profitability (RMW), value (HML) and investment (CMA).
- R_p is the return of portfolio
- R_F is the risk-free return
- R_M is the market return
- SMB is the return on a diversified portfolio of small stocks minus the return on a diversified portfolio of big stocks,
- HML is the difference between the returns on diversified portfolios of high and low B/M stocks,
- RMW is the difference between the returns on diversified portfolios of stocks with robust and weak profitability.
- CMA is the difference between the returns on diversified portfolios of the stocks of low and high investment firms, which we call conservative and aggressive.
- WML is the difference between the simple avg. returns of winner portfolios and simple

avg. returns of loser portfolio.

- e_{it} is a zero-mean residual.

3.8 Methodology

We used the Fama and MacBeth (1973) methodology to examine the multivariate model on individual stock returns. The used methodology has two phases: firstly, risk assessment and secondly, testing. During the first phase, we calculate a beta of the independent variables DRM (Downside market risk), SMB (small minus large, big), HML (high minus low), CMA (conservative minus aggressive), RMW (robust minus weak), WML (winner minus loser) Using regression analysis of the time series in each portfolio of excess returns. In the second step, a regression analysis is made between the beta values obtained from step 1 as a standalone variable and the portfolio excess return.

The most important and widely used method to test CAPM is the one presented by (Fama & MacBeth, 1973). Its widespread acceptance is primarily motivated by the fact that F & Mac (1973) allow betas to vary with time (Campbell *et al.*, 1997). FMac (1973) method also provides for measurement error by creating portfolios in an irregular way. Furthermore, they use beta of past time as an influential variable to accommodate for selection bias.

These reasons make F & Mac (1973) two-step approach an obvious choice to test CAPM. F & Mac (1973) use two-step approach by forming pre-ranking beta portfolios and testing for post-ranking beta portfolios. This study is based on the F & Mac (1973) procedure and makes the changes necessary to better serve the results of this study. The mentioned procedure will be applied on below multifactor CAPM model under the framework of downside risk estimator.

$$R_p = a_i + \beta^D (R_M - R_F) + \beta_{SMB} (R_{SMB}) + \beta_{HML} (R_{HML}) + \beta_{RMW} (R_{RMW}) + \beta_{CMA} (R_{CMA}) + \beta_{WML} (R_{WML}) + e_{it} \dots \dots (3)$$

Firstly, this study estimates betas of the respective stocks and then resorted again based on downside beta based (Fama & MacBeth, 1973) procedure. All the portfolios are built and ranked from highest to lowest downside beta portfolios. This procedure is repeated again by firstly sorting stocks on downside beta into portfolios and then resorts these portfolios on beta

basis portfolios ranked from highest to lowest beta portfolios. These two sets of portfolios each are used in first pass to yield beta and downside beta of portfolios for the former and the latter set respectively.

Moreover, stocks are sorted on relative downside beta to form portfolios to perform F & Mac (1973) regressions to make sure that downside beta is not reflecting regular beta. Moreover, incremental effect of downside beta can be assessed. Relative DB (downside beta) is defined as the difference between DB and beta. This approach has two major advantages namely; it specifies sorting criteria and secondly, it disentangles effects of effects of high correlation between beta and downside beta. This study uses equal-weighted portfolios for portfolio construction.

Subsequently, F & Mac (1973) perform second pass for each month via cross-sectional analysis of portfolio beta and portfolio return. To test the four factor model under the framework of downside risk the following equation will be used

$$R_p = a_i + \lambda_1 \beta^D + \lambda_2 \beta_{SMB} + \lambda_3 \beta_{HML} + \lambda_4 \beta_{RMW} + \lambda_5 \beta_{CMA} + \lambda_6 \beta_{WML} + \epsilon_{it} \dots (4)$$

Where R_p is portfolio returns, a_i is intercept, λ_1 risk-return relationship, β^D is downside beta, $\lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6$ are the coefficient of small minus big, high minus low, Robust minus weak, conservative minus aggressive and Winner minus Loser while ϵ_{it} residuals for portfolio p at time t .

The following t-statistic test is used to test whether the asset pricing model that we use is correct.

$$t(\bar{\lambda}_j) = \frac{\bar{\lambda}_j}{s(\lambda_j) / \sqrt{n}}$$

λ_j is the mean of estimated j^{th} coefficient, $s(\lambda_j)$ is the month-by-month standard deviation of estimated coefficients of the sub-period, and n is the number of months used in the sub-

periods. In the first part FamaMacBeth (1973) procedure we perform time series regression analysis on portfolio returns by using independent variables DRM (Downside market risk), SMB (small minus big), HML (high minus low), RMW (robust minus weak), CMA (conservative minus aggressive), WML (winner minus loser) taking different time period and get the results of their coefficients shown in table 1 to table 4. The following equation is used to get the values of coefficient for first pass regression.

$$R_p = a_i + \beta^D (R_M - R_F) + \beta_{SMB} (R_{SMB}) + \beta_{HML} (R_{HML}) + \beta_{RMW} (R_{RMW}) + \beta_{CMA} (R_{CMA}) + \beta_{WML} (R_{WML}) + eit \dots\dots (5)$$

In second part Fama & MacBeth (1973) procedure we perform cross sectional regression analysis with the values of betas which we obtain from first pass regression and the portfolio returns. This pass gives the value of lambdas and their respective t-values. Insignificance or significance of variables is tested by their t-statistic values which shown in table 5. The following regression equation is used for second pass:

$$R_p = a_i + \lambda_1 \beta^D + \lambda_2 \beta_{SMB} + \lambda_3 \beta_{HML} + \lambda_4 \beta_{RMW} + \lambda_5 \beta_{CMA} + \lambda_6 \beta_{WML} + eit \dots\dots (6)$$

3.9 Data Analysis Software

Excel and EViews both used for analysis of data. Initially, Microsoft excel is used for entering data on the basis of each company yearly and mathematical formula is applied on excel for calculating holding period return. Then EViews is further used to analyze data on the basis of Fama & MacBeth add in EViews to run multiple regression analysis following Fama MacBeth methodology.

3.9.1 Fama MacBeth Regression Analysis

For the purpose of describing the impact and the positive and negative relation by means of an equation which could have a predictive value, multiple regression analysis is used (Fama & MacBeth, 1973). Multiple regression method is used to define the overall effect of multifactor asset pricing model on stock return portfolio.

3.10 Relationship among studying variables

3.10.1 Dependent variable

Stock returns / portfolio returns

The dependent variable to the study is stock return. We make the thirty portfolios of giving companies return. Several formulas in literature to calculate the stock return. This research calculate the stocks return on the basis of following formula

$$R_{jt} = \ln \left(\frac{P_{jt}}{P_{jt-1}} \right)$$

R_{jt} = is the return of stock j at month t.

P_{jt} = is the closing price index of the stock j at month t

P_{jt-1} = is the closing price index of the stock j at month t-1

3.10.2 Independent variables

Multifactor in CAPM (capital asset pricing model) are independent variables such as Size of the firm represented by capitalization of firm, value of the firm represented by book to market ratio, investment represented by total asset of the company, profitability represented by earning per share, momentum and downside risk represented by downside market risk.

Independent variable is calculated by following formula

Downside Risk (Beta)

Downside risk (Beta) = $R_m - R_f$

$$\beta_{im}^{(BL)} = \frac{E\left[(R_i - R_f) \min(R_m - R_f, 0)\right]}{E\left[\min(R_m - R_f, 0)\right]^2}$$

Size

Market capitalization = stock price x no. of share

SMB = Small minus Big = Average Returns of Small Size minus Big Size = $1/3 (S/H + S/M + S/L) - 1/3 (B/H + B/M + B/L)$

Value

Book to market ratio = book value / market value

HML = High minus Low = Average Returns of High BE/ME minus Low BE/ME ratio = $1/2 (S/H + B/H) - 1/2 (S/L + B/L)$

Profitability

Earnings per share = net profit income / no. of shares outstanding

RMW = Roberts minus Weak = average return of Roberts and weak profitability = $1/2 (S/R + B/R) - (B/W + S/W)$

Investment

Total assets = sum of current asset & non-current asset

CMA = Conservative minus Aggressive = average return of High and Low investment firm = $1/2 (S/A + B/A) - 1/2 (S/C + B/C)$

Momentum

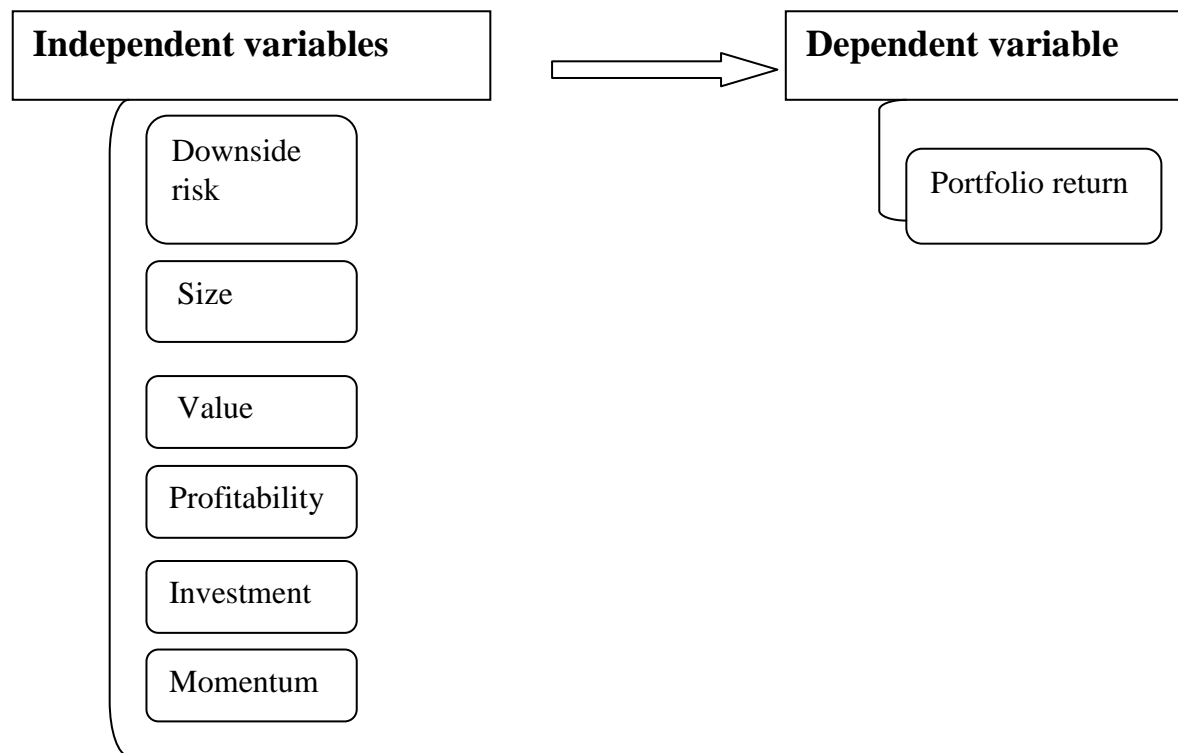
Momentum return at the end of month t is the 11 month return from the end of month t-12 to t-1

WML = Winner minus Loser = average return of winner and loser portfolio return = $1/2 (S/W + B/W) - (S/L + B/L)$

3.11 Theoretical framework / Conceptual framework

The conceptual framework based on the research is explained below, that describes the relationship among independent variables and dependent variables. Portfolio return is the dependent variable of the research whereas size, value, investment, profitability, momentum and downside risk are the independent variables in the research.

Figure 3.1 Conceptual Framework



3.12 Variables

Portfolio return is the dependent variable of this research; while multifactor asset pricing model (CAPM) are the independent variables and they are explained below.

3.12.1 Stock Return

Stocks return is the dependent variable in the research. By definition, stock return is the return on investment it comprises any change in value of investment which investor received from investment. In this study we have the prices of stocks but our requirement is to get returns

for analysis purpose that's why the prices of stocks converted into returns by applying above formula in (3.10.1). Then we make the portfolios of these returns for analysis purpose. Portfolio is the mixture of different stocks by different companies in order to make an integrated group. We made thirty portfolios of the companies' return in this study for the period 2000 to 2015. The portfolios of the return are more helpful than using different companies.

3.12.2 CAPM (Capital Asset Pricing Model)

The capital asset pricing model can be defined as a financial model which uses multiple factor in its account to explain market phenomena and the equilibrium asset price. The capital asset pricing model (CAPM) is a best way to determine the relationship among equity portfolio or asset risk and the expected return to investors in a rational market equilibrium (Sharp, 1964). This study uses multiple factors to test the impact of this multi-factor asset pricing model on portfolio return. Downside Beta, SMB, HML, Momentum (WML), profitability (RMW), and investment (CMA) are the independent variables for this study.

Downside Beta:-

The risk of an actual yield below the expected yield, or uncertainty about the size of this loss-related difference, is a negative beta risk. To obtain downside risk beta this study follows the Bawa and Lindenberg (1997) formula to calculate downside market return (Beta) in the place of regular beta. To obtain downside risk beta we have to value of market return and Risk free return. Then apply the Bawa and Lindenberg formula obtain Colum of $R_m - R_f$. this Colum have value below the average or mean value which called as Downside market return (beta).

The formula is:

$$\beta_{im}^{(BL)} = \frac{E[(R_i - R_f) \min(R_m - R_f, 0)]}{E[\min(R_m - R_f, 0)]^2}$$

Where R_i the return on security I, R_m is the return on market portfolio and R_f is the risk free rate. The numerator in formula is referred to as the co-semi-variance of returns below R_f on the market portfolio with returns in excess of R_f on security i.

Size (Small Minus Big): -

Small minus Big is the return on a portfolio of small stocks (small cap firm) minus the return of portfolio of big stocks (Big Cap). The Small minus Big portfolio is organized by the value or size of market according to Fama and French (1996), and the mean market impartiality is calculated at the cutting point. The stocks are classified in two groups: the companies that have market value greater than the cutting point are considered as the big company stocks (B); whereas, those companies whose market value is less than the cutting point are considered as small company stocks (S). It is supposed that low & high market circumstances have uneven consequence on beta. Additionally, according to book to market sorting, in order to bring the book to market value to the ratio of stocks, it is classified into three groups. The first group is called high group (H) because it has 30% book to market ratio which is highest in whole stock. The second group has 40% of whole stocks has mild book to market ratio and thus known as medium group (M) and finally, the third group which has 30% of whole stocks and has the lowest book to market ratio named as low group (L). After the classification of the stock, stocks are listed into 6 groups according to the cross of stocks group as S/L, S/M, S/H, B/L, B/M, B/H. The method of Fama and French (1996) is used to weight average monthly returns of each group, and following formula is used to calculate the SMB factor.

$$\text{SMB} = \text{Small minus Big} = \text{Average Returns of Small Size minus Big Size} = \frac{1}{3} (\text{S/H} + \text{S/M} + \text{S/L}) - \frac{1}{3} (\text{B/H} + \text{B/M} + \text{B/L})$$

Market Capitalization

Market capitalization is defined as a rate which you get after multiplying the outstanding shares of the stock of company by the existing price of a share. The total market value of a company's equity is known as market capitalization. There are many ways to value a company and calculate the worth by multiplying the price of stock with the number of issued shares and market capitalization is one of them. Hence, if a company has one sort of stock, the market capitalization of the company could be obtained by multiplying the current market share price by the number of shares. Yet, if a firm has several kinds of equities before the market cap would be the total of the marketplace caps of the different kinds of shares.

Market capitalization = MPS * No. of unsettled shares

Value (High minus Low): -

The high minus low is the variance among the returns of low and B / M stocks. HML (high low less than) represents risk factor of rate of return that involves the effect of book-to-market ratio (BE / ME). HML differs separate month among the average return rate of two high BE / ME portfolios (S / H and B / H) and the average rate of return of two portfolios with low B / ME ratio (S / L and B / L). Use Fama and French equation (1996) to calculate the high minus low value.

HML = High minus Low = Average Returns of High BE/ME minus Low BE/ME ratio = $1/2 (S/H + B/H) - 1/2 (S/L + B/L)$

Value factor calculated by two other factors: Book and market value

Book value

Book value defined as the value calculated by observing the historical cost of firm or value of accounting.

Market value

Market value of firm is evaluated in the stock market by its market capitalization.

Book to market ratio = book value / market value

Investment (Conservative minus aggressive):-

Investment is the financial term earns reappearance by acquiring assets of firm. Conservative minus aggressive is the variance among the returns on diversified portfolios of the stocks of high and low investment companies that we call conservative and aggressive.

CMA = Conservative minus Aggressive = average return of High and Low investment

$$\text{Firm} = 1/3 (S/A + B/A) - 1/2 (S/C + B/C)$$

Total Asset

Total asset is used as proxy variable for investment. Total asset is the combination of current and non-current asset

Total assets = sum of current asset & non-current assets

Profitability (Robust minus weak):-

The strong and weak earning is the variance among earnings on diversified portfolios of stock with weak & strong earnings. Robust profitability is the good and high profitability while weak profitability refers to low profitability. The following formula is used to calculate robust minus weak profitability.

$$\text{RMW} = \text{Robust minus Weak} = \text{average return of Robust and weak profitability} = 1/2 (S/R + B/R) - (B/W + S/W)$$

Earnings per share

Profit per share is used for profit factor as proxy variable. (EPS) Earnings per share is part of the earnings of a company as per the share of ordinary shares. EPS is a measure of the company's profitability. It's common for a firm to describe EPS familiar for unusual stuffs and mitigate the possible share. The shareholders deliberate that present and future profits, and profit constancy are significant, and therefore emphasis on their study on the company's profitability. They're concerned about the monetary situation that will distress the company's capability to pay profits and evade economic failure.

Momentum (Winner minus Loser):-

This is the change among the simple averages. Returns of portfolios of winners and a simple average return of the losing portfolio. For the momentum portfolios, stocks will be classified as W and losers grounded on the momentum return at the end of each month. The

study uses the Jegadeesh and Titman (1993) method to compare the momentum factor. The momentum return at the end of the month is a return of 11 months from the end of month $t - 12$ to $t - 1$.

$$\text{WML} = \text{Winner minus Loser} = \text{average return of winner and loser portfolio return} = \frac{1}{2} (\text{S/W} + \text{B/W}) - (\text{S/L} + \text{B/L})$$

3.13 Hypothesis of the Study

According to the above mention theoretical framework in this study following hypothesis are formulated:-

- **H₁**: There is significant impact of downside risk on portfolio returns .
- **H₂**: There is significant impact of size on portfolio returns.
- **H₃**: There is significant impact of value on portfolio returns.
- **H₄**: There is significant impact of momentum on portfolio returns.
- **H₅**: There is significant impact of profitability on portfolio returns.
- **H₆**: There is significant impact of investment on portfolio returns.

CHAPTER NO.4

RESULTS AND DISCUSSION

4.1 Results and Discussion

This chapter includes results and discussion based on Fama-MacBeth methodology procedure. We categories the data into four level i.e. 2000 to 2003, 2004 to 2004 to 2007, 2008 to 2011 and 2012 to 2014. First of all dependent and independent variables are calculated. Secondly, after calculating the variables the Fama-MacBeth two pass regressions is run to check the impact of multifactor asset pricing model on portfolio returns on listed firm in Pakistan Stock Exchange. First step is for risk estimation and second step for testing. In two pass regression first we calculate the beta values of the independent variables downside market risk (DRM), size of the firm (SMB), value of the firm (HML), investment (CMA), profitability (RMW), momentum (WML) using the time series regression on each portfolio excess return. In second pass again the beta values from the first pass used as independent variable to regress with portfolio return to obtain lambda values of each variable by using cross section regression. Lambda values are final values to check the impact of multifactor asset pricing model on stock portfolio returns. We took the average of sloop and intercept obtained from cross sectional regression and tested for statistical significance. Ltifi *et al.*, (2016) says that regression analysis shows importance of independent variables in predicting the dependant variable.

4.2 First part regression

Table 4.1: Fama Macbeth First Part Regression Results for 2000-2003

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.019892	0.004639	4.288025	0.0003
β_{drm}	-0.004344	0.002696	-1.610853	0.1209
β_{smb}	-0.006406	0.002803	-2.285494	0.0318
β_{hml}	-0.004518	0.003074	-1.469669	0.1552
β_{wml}	0.000880	0.002199	0.400057	0.6928
β_{rml}	-0.002390	0.002783	-0.858729	0.3994
β_{cma}	-0.001886	0.004532	-0.416113	0.6812
R-squared	0.847950			
Adjusted R-squared	0.808285			
F-statistic	21.37771			
Prob(F-statistic)	0.000000			

Interpretation:

In the first table of 2000-2003 the first factor DRM having coefficient value -0.004344 has negative impact on portfolio stocks returns. The impact is negative and insignificant with t-statistic -1.61 at 1% level of significance with p-value 0.1209 or 12.9%. The outcomes of 1st indicator support the null hypothesis as compare the research hypothesis. The second indicator SMB having coefficient value -0.006406 shows negative impact on stocks return of portfolio with t-stat value -2.2 significant as per 2% criteria do not support null hypothesis with p-value 0.0318 or 3.18 %.

The 3rd factor HML (High minus Low) having value of coefficient -0.004518 also have negative impact on stocks returns. Its t-stat value -1.469669 supports negative results with the p-value of 0.1552 Or 15% supports null hypothesis and rejected research hypothesis. The 4th key factor WML supports positive impact having coefficient value 0.000880. This shows that WML impact on portfolio stocks return is positive. The factor WML has 0.02 its t-stat value which is less than 1% significance level having p-value 0.6. The 5th indicator RMW shows negative impact having value -0.002390 with the value of t-stat -0.00858 shows insignificant impact according to specific criteria. The p-value 0.3994 Or 39% demonstrate null hypothesis as compare to research hypothesis.

The 6th CMA factor having value of coefficient is -0.001886 negative impact on stocks portfolio returns. T-stat value -0.41663 also shows insignificant and negative impact in results. Its p-value 0.6812 or 68% support null hypothesis.

The R-square of this model shows total variation is 84% which shows collectively change by DRM,SMB,HML,WML,RMW and CMA. The adjusted value of R² is 80% and F-stat is 21% with the probability level of 0.00000 which is significant at 1% level. It shows the fact that model is good fit.

Table 4.2: Fama Macbeth First Part Regression Results for 2004-2007

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.034029	0.002760	12.33055	0.0000
β_{drm}	-0.015624	0.001382	-11.30637	0.0000
β_{smb}	-0.002608	0.001539	-1.695397	0.1035
β_{hml}	-0.008229	0.004298	-1.914802	0.0680
β_{wml}	0.005258	0.002767	1.900561	0.0700
β_{rmw}	-0.003499	0.002943	-1.188792	0.2467
β_{cma}	-0.001063	0.001697	-0.626303	0.5373

R-squared	0.914971
Adjusted R-squared	0.892790
F-statistic	41.24938
Prob(F-statistic)	0.000000

Interpretation:

The results of period 2004-2007 present in table 2. The value of DRM coefficient show negative change by -0.015624 values. The factor DRM having -11.30637 t-stat and 0.0000 p-value which is strongly significant at maximum level of significance means not in the favor of null hypothesis. The 2nd factor SMB having value of -0.002608 shows negative impact on portfolio stocks returns. This impact is negative and insignificant at 1% level of significance with the value of t-statis -1.695397 with a p-value of 0.1035 or 10%. The 3rd key factor HML having value of coefficient -0.008229 gives negative impact on portfolio stocks returns. The negative t-stat value -1.914802 and p-value which is 0.0680 shows the factor is insignificant and support null hypothesis at 1% level of significance. The results of 4th factor WML having value of coefficient 0.005258 gives the positive impact on portfolio stocks returns. The t-stat is 1.900561 and p-value is 0.0700 Or 7% is insignificant at 1 and 5% level of significance.

The outcomes of 5th factor RMW having coefficient value -0.003499 which is negative. The t-stat value is -1.188792 and p-value is 0.2467 Or 24% is demonstrating fact for null hypothesis ass compare to research hypothesis. The 6th factor CMA having coefficient value -0.001063 also gives negative insignificant impact on portfolio return with the t-stat value of -0.626303 and p-value 0.5373 supports the null hypothesis.

The R² explain total variation in variables by 91%. The adjusted R² is 89% after consideration of sample size. The value of F-stat is 41.24 with the p-value of 0.000000, means significant at 1% level. It shows the fact that model is good fit.

Table 4.3: Fama Macbeth First Part Regression Results for 2008-2011

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020332	0.013158	-1.545277	0.1359
β_{drm}	-0.000314	0.003995	-0.078674	0.9380
β_{smb}	-0.003582	0.006315	-0.567262	0.5760
β_{hml}	-0.004843	0.001263	-3.833387	0.0009
β_{wml}	-0.002053	0.004283	-0.479311	0.6362
β_{rmw}	-0.006463	0.002920	-2.213329	0.0371
β_{cma}	0.003494	0.006288	0.555561	0.5839
R-squared	0.674277			
Adjusted R-squared	0.589306			
F-statistic	7.935356			
Prob(F-statistic)	0.000104			

Interpretation:

The value of coefficient for the 1st key factor DRM is -0.000314 which is negative for portfolio stocks returns for period 2008-2012. The t-state value is -0.078674 and p-value is 0.9380 is insignificant and this finding is rejected as it is not as per the stated arguments. The 2nd factor SMB having value of coefficient -0.003582 shows negative impact during stated year with the t-stat value which is -0.567262 and p-value 0.5760 is insignificant at maximum level of significance. The 3rd key factor HML also have negative coefficient value is -0.004843 with the t-stat value -3.833387. the p-value 0.0009 is significant at 1% level of significance support research hypothesis and rejected null hypothesis.

The 4th factor which is WML having value of coefficient -0.002053 which is also

negative. The impact of WML is insignificant with the t-stat value -0.479311 and p-value 0.6362 which is lower than as per stated criteria. The 5th factor RMW impact on portfolio stocks returns is negative with the coefficient value -0.006463. The impact is significant with the t-stat value which is -2.213329 and p-value 0.0371 which is greater than significance level of 1% thus support research hypothesis. The last 6th factor CMA having positive impact with coefficient value of 0.003494. The t-state value is 0.555561 and p-value is 0.5839 gives insignificants impact and support null hypothesis. The R² of this model is 67% explain total variation in variables. The adjusted R² 58% after the consideration of sample size. The value of F-stat is 7.9 with the p-value 0.000104 which is significant at 1% level shows model is good fit.

Table 4.4: Fama Macbeth First Part Regression Results for 2012-2014

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015892	0.004246	3.742649	0.0011
β_{drm}	-0.002512	0.003613	-0.695195	0.4939
β_{smb}	0.005715	0.000915	6.242883	0.0000
β_{hml}	-0.005045	0.000502	-10.04614	0.0000
β_{wml}	-0.004468	0.002973	-1.502924	0.1465
β_{rmw}	-0.005787	0.001868	-3.098052	0.0051
β_{cma}	0.005157	0.000546	9.446711	0.0000
R-squared	0.890718			
Adjusted R-squared	0.862209			
F-statistic	31.24403			
Prob(F-statistic)	0.000000			

Interpretation:

The 1st factor DRM having coefficient value -0.002512 which is negative for the period 2012-2014. The t-stat value -0.695195 and p-value 0.4939 gives insignificant result and support the null hypothesis. The 2nd key factor SMB having coefficient value 0.005715 which gives positive impact on portfolio stocks returns for the stated period. The t-stat value is 6.242883 and p-value 0.0000 which is significant at 1% means that there is no impact of SMB on portfolio stocks return with the level of confidence of 99%.

The 3rd key factor HML having value of coefficient is -0.005045 which gives negative impact. The t-stat value of HML is -10.04614 and p-value is 0.0000 gives significant at 1% level of significance. The 4th factor WML having coefficient value -0.004468 which is also give negative impact. The t-stat value of WML is -1.502925 and p-value 0.1465 which is insignificant at maximum level of significance at 1%.

The 5th factor RMW having coefficient value -0.005787 gives negative impact. Their t-stat value is -3.098052 and p-value 0.0051 or 0.51% is significant at 1% level of significance. The last 6th factor CMA having 0.005157 coefficient value which is positive. The impact is positive and significant with t-stat value 9.446711 and p-value of 0.0000 significant at 1% level of significant. The R^2 89% explained total variation in variables. The adjusted R^2 86% after consideration of sample size. The value of F-stat is 31.24 with the p-value of 0.000000, means that is significant at 1% level. It shows the fact that model is good fit.

4.3 Second part regression

In second pass regression we run the cross sectional regression analysis with Beta values which obtained from first pass regression after performing time series analysis of independent variables with the portfolio returns. This analysis gives us value of lambdas of these independent factors and t-values. The key assumption behind the acceptance of null hypothesis is that values of lambdas for DRM,SMB,HML,RMW,WML and CMA has insignificant outcomes at 01% level of significance.

Table 4.5: Fama Macbeth Second Part Regression Results

	INTERCEPT	λ_{drm}	λ_{smb}	λ_{hml}	λ_{wml}	λ_{rmw}	λ_{cma}
2000-2003	0.019892*	0.004344	0.006406	0.004518	0.000880	-0.002390	-0.001886
	2.038424	-0.398144	-1.281312	-0.772593	0.120510	-0.45478	-0.350320
2004-2007	0.034029*	-0.015624*	-0.002608	-0.008229	0.005258	-0.003499	-0.001063
	5.178917	-2.093616	-0.833353	-1.29364	0.280998	-0.830027	-0.266894
2008-2011	-0.020332*	-0.000314	-0.003582	-0.004843	-0.002053	-0.006463	0.003494
	-2.078318	-0.037528	-0.549628	-1.215215	-0.191902	-1.109990	0.486604
2012-2014	0.015892	-0.002512	0.005715	-0.005045*	-0.004468	-0.005787	0.005157
	1.416664	-0.262542	1.389031	-1.839999	-0.617248	-1.513945	1.615612

Interpretation

In the first pool of 2000-2003 the values of t-stat for DRM, SMB, HML, WML, RMW and CMA is insignificant as per selected criteria at 01% level of significance. First pool strongly accepting the null hypothesis which means that there is an impact of multifactor on stock portfolio returns or the impact may be positive or negative. The lambdas value in first generated pool shows the either there is positive or negative impact of these factors on portfolio returns. The factor DRM (-0.004344), SMB (-0.00646), HML (-0.004518), RML (-0.002390) and CMA (-0.001886) have negative impact on portfolio returns. The factor WML (0.000880) has positive value which shows that this factor has positive impact on portfolio return.

In the second generated pool of 2004 to 2007 the t-stat value of factors DRM, SMB, HML, WML, RMW and CMA insignificant at sorted criteria at 01% level of significance. They also support the null hypothesis and rejected the research and alternative hypothesis. Null hypothesis supported the impact on portfolio return. The values of lambdas shows the negative impact of DRM (-0.015624), SMB (-0.002608), HML (-0.008229), RMW (-0.003499) and CMA (0.001063) on portfolio returns and the lambdas value of WML (0.005258) has the positive impact on portfolio return.

The third pool from 2008 to 2012 also supports the null hypothesis according to t-stat value of all factors which have impact on portfolio returns. The t-stat values of all factors are insignificant as per selected criteria at 01% level of significance. The lambdas value of factors show the positive or negative impact on portfolio return. The lambdas value of DRM (-0.000314), SMB (-0.003582), HML (-0.004843), WML (-0.002053) and RML (-0.006463) have positive impact on portfolio returns. The portfolio return in the third pool is positively impacted by the CMA with the value of lambda (0.003494).

In the last pool 2012 to 2014 the t-stat values also in the favor of null hypothesis and rejected the alternative hypothesis all t-stat value are insignificant at the level of 01% significance. Null hypothesis support impact on portfolio return so all factors has impact on portfolio returns. The factors impact is negative on portfolio return by negative value of lambdas i.e DRM (-0.002512), HML(-0.005045), WML(-0.004468) and RMW (-0.005758). The factor SMB (0.005715) and factor CMA (0.005157) has positive impact on the portfolio returns.

CHAPTER NO.5

CONCLUSION, DISSCUSSION AND RECOMMENDATION

Emerging markets are different from developing markets in term of their nature and inherent characteristic. Emerging markets are more volatile than develop markets. Therefore it is understandable that the explanatory power of independent variables is relatively high in explaining the portfolio return in the develop countries however, it is not in Pakistan.

Investors are more conscious about their losses regarding investment. In order to minimize their risk and maximize their profit on investment, investors used different market indicators. Thus, ultimate and utmost objective of investor is return. Investors always try and find the way to maximize their return on investment. Thus, research helps the investor to allocate their downside risk linked with their investment returns. This multifactor asset pricing model provides a platform to investor to reduce their risk which associated with losses and maximize their returns under the downside risk estimation that either the multifactor impact their stock returns or either impact is negative or negative on stock returns.

This research is useful for business organizations to reach their place of residence. This research provides a better allocation of resources, improving business security, improving business alignment and changing the concentration from cost towards investment. The concentration of business organization is increased before choosing a project for investment or when it stops investing in the project. It also helpful for both investors the financial and non-financial sector prior to making their investment decisions. It give a positive signal to investors that investor should invest in that stock because the risk on their stock return estimated and calculated.

An investor considered two factors in the selection of stocks that is risk and return. In order to minimize risk and maximize return, investor use market indicators (Alroaia et al., 2012). The problem is exploring the impact of multifactor asset pricing model on stock return in Pakistan Stock Market. If there is any association then how this relationship is beneficial for the investors, corporate managers, researchers and business organization.

While choosing stocks for investment, the investor tends to be cautious first about the high average return, and secondly that the stocks have a lower risk or deviation. Thirdly, they take these stocks for the purpose of intervention, whose performance is not good in the period of recession with slight risk. Investors may presently vary in their willingness or capability to withstand the risks associated with the recession as well as to tolerate them to accept the overall risk.

Many research studies have been conducted on the returns of stock market since they help not only investors but also companies to determine what affects their return on investment and the value of company stocks, respectively. Business organizations are trying to develop their fixed value for attraction of investors and also for advancing their creditworthiness. This relation also assists companies, managers as well as investors to attain their desired goals. Therefore, managers and investors can acquire a higher level of return by making investment in stocks that having a higher rate of return by studying market trends of past.

In nut shell, this study aims at examining the relationship between stock returns and the multi-factor asset pricing model on the Pakistan Stock Exchange from 2000 to 2015.

There are other factors whose impact is associated with the stock returns like political instability, terrorism, depreciation in currency with respect to the dollar, inflation rate, unemployment level, deficit budget over consecutive past years, inefficient markets etc. political instability is the largest factor that have an effect on stock exchange of the country. Pakistan faced the political instability in the past few decades, which affect the stock exchange. Many times Pakistan Stock Exchange (previously called Karachi Stock Exchange) crushed during political instability phased and then revived after when once it crushed.

The second biggest factor influencing the stock market of Pakistan Stock Exchange is

terrorism. Pakistan has been confronting terrorism problem from past few years till date. It has negative consequences on the activities of the stock market. The share price of companies is also reduced due to this factor and investors, particularly international investors are forced to sell their portion of investments.

Depreciation in currency with respect to the dollar is the third largest factor that affects the stock exchange of the country. As the dollar is the international currency after terrorism and political instability Pak currency decreases with respect to the dollar. Due to the depreciation in Pak Rupee stock price decreased in turn the dividend which the shareholder received also decreases.

Inflation is the fourth largest factor affecting a country's stock market. Due to the appreciation of the dollar in relation to Pak Rupee, the value of Rupee has declined, leading towards inflation as a whole in the country. The imported goods' prices have also increased from machinery utilized in industries imported from the Western countries, which pays its price against the dollar.

Unemployment or recession in the business also affects the country's stock market. For this reason, people do not have sufficient or spare money to make investment in the stock market. A drop in exports is another factor that affects the stock exchange efficiency. In 2000 Pakistan lead the textile industry, and the stock exchange at that time was impressive. But some of the factors that have reduced Pakistan's exports are child labor, power supply crises, rising fuel costs, high inflation, rising borrowing costs, inefficient employment, obsolete technology, high labor costs, international trade competition, high government taxes and lower exports. Average and high import rate. That is the reason why Pakistan stock exchange is still in developing phase.

Last but not least, Deficit budget is another factor that affect the stock exchange of the country that the Pakistan faces in consecutive past years.

5.1 Conclusion

This study focus on impact of multi-factor asset pricing on portfolio stocks return of PSE (Pakistan Stock Exchange) under framework of Downside Risk for the period of 2000-2015. The study used Fama Macbeth (1973) methodology to test hypothesis. In this research different factors i.e. Downside Risk, Value, Size, Investment, Profitability and Momentum used to test their impact on companies stock returns. Made portfolios of firm returns listed in Pakistan Stock Exchange. So that it can provide better results. The result shows that all factors have insignificant outcomes mostly which leads towards in favor of null hypothesis i.e factors considered having impact on stock returns either positive or negative.

The Downside market Risk gives overall insignificant result shows their impact on portfolio stocks return. Means this variable have importance for investors while doing investment. DRM will represent the relationship between risk and expected return in better way. According to the results of the study the downside market risk is negatively associated with the portfolio returns. So the result of the study indicates that the investors are interested in downside risk for the final prediction of the stock return portfolio. DRM strongly associated while doing investment and helpful for investor in asset pricing model. Investors cannot ignore the downside risk factor while selecting their investment strategy. Higher the DRM make investors more conscious for investment in stocks. The investors can predict the stock returns in a better way under framework of Downside Risk.

The small companies outperform big companies due to stock price volatility of small companies. It means big companies provide lower stock returns as compared to small companies. The results of SMB factor throughout the period insignificant at 01% level of significance. The results of the study for the factor of SMB (small minus big) supported null hypothesis which means the SMB have impact on the portfolio returns. The result supported that small companies outperform big companies. (Fama and French, 1992, Fama and French, 1996, Gaunt, 2004, Rehman et al., 2006, Iqbal and Brooks, 2007, Al-Mwalla and Karasneh, 2011).

The overall stated results of value (HML) factor throughout the period are insignificant at 01% level of significance. Insignificance of the factor HML supported the null hypothesis that HML has impact on stock portfolio returns. The value factor results measure in term of book to

market ratio have finely stated that value stock firms (having high book to market ratio) outperform growth stock firms (having low book to market ratio). Fama and French, 1992, Fama and French, 1996, Davis et al., 2000, Gaunt, 2004, Rehman et al., 2006, Iqbal and Brooks, 2007, Al-Mwalla and Karasneh, 2011).

The finding for CMA for stated time period is insignificant at 01% level of significance. The finding for CMA is also in the favor of null hypothesis which showed the impact on stock portfolio return. The investment factor which is measured in term of (total assets) conservative investment firm and aggressive investment firm gave results that firm which are associated with aggressive investment are linked with high risk while the other firms which associated with conservative investment are linked with low risk level and low profitability. The highly investment firms not always have high profitability. (Fama and French, 2013).

The results of profitability (RMW) have insignificant results at 01% level of significance. The profitability of small and big companies measures in terms of (earning per share) robust profitability and weak profitability firms have stated that highly profitable extreme value stocks are rare, especially for big stocks. (Fama and French, 2013). The findings regarding the momentum factor (WML) in this study supported the null hypothesis at 01% level of significance for all generated pool. The momentum effect measured in term of stocks returns in last 1-12 months returns. We can say that it's possible to increase your earnings by using momentum strategy by adding those stocks in your portfolio which perform well and selling those which perform poorly in last 1-12 months. (Fama and French, 1996, Andrew et al., 2001). The portfolios that perform well (past winner momentum portfolios) have greater exposure to the downside risk factor than those portfolios that perform poorly (past loser momentum portfolios). (Ang and Xing, 2002). On the basis of this research it is concluded that there exist positive relationship among WML (winner minus loser) with the stock portfolio returns and other DRM, SMB, HML, RMW and CMA have negative relationship with the portfolio returns in the 1st and 2nd generated pool.

On the basis of this study it is stated that there is positive relationship between CMA (conservative minus aggressive) and stock portfolio returns and other DRM, SMB, HML, WML and RMW have negative relationship with the portfolio return in the 3rd pool. In the 4th pool the

CMA (conservative minus Aggressive) and SMB (small minus big) have positive relationship between stock portfolio return and other factors DRM, HML, WML and RMW have negative relationship with stock portfolio returns. Investors are more concerned about their negative return so this study helps the investors to make investment by checking the impact of all these factors on returns. portfolio of companies return make easy to understand the impact on returns under framework of downside market risk and it leads towards in position to earn more returns that will lead Pakistan towards financial prosperity. So we can say this asset pricing model under framework of downside risk will explain the variation in stock returns in Pakistan Stock Exchange in better way.

5.2 Discussion

Discussion based on some political and economic factors which are affecting Pakistan Stock Market. When the economy faces problems such as corruption, inflation, political instability, terrorism, depreciation in currency with respect to the dollar, inflation rate, unemployment, and budget deficits, the stock results are not more sustainable.

Financial crisis in 2007 also affect the Pakistan economy and stock market. In that period the stock return are no more sustainable. When there is an artificial increase in returns only just to attract investors is not provided good results. There should be proper evaluation of company not just on the basis of audit (just to examine the book of account) but also to deeply investigate the information that the company is providing on the basic pillars of corporate governance. Culture and social factor also fluctuates the stock prices and returns.

5.3 Limitation of Study

There are several limitation found during this study. One of the basic limitations is availability of data. The number of firms for required data is not same for all years. The firms vary year to year because the required data of variables are not available for all years. So the firms which have missing the required data of variables are eliminated. In order to get more accurate results in future researcher must access to other sources for variables data. The results are more accurate when the numbers of firms are same for the whole time period in each year. The time period of data may be increased by researcher. Other limitation may be considered that

the model can be modified in future depending on the economic circumstances prevailing in the country and its future market conditions.

5.4 Recommendations

According to my best of knowledge based on the analysis made, following recommendations are proposed to the investors, corporate managers, researchers and business finance graduate.

5.4.1 Recommendation for investor

For investors, the subsequent recommendations are extracted from this study:

- Before making investment decision in a business, the investor must examine the risks associated with the losses in the form of a downside risk that not only brings profit upon return.
- If investor is uneducated investor then he/she should called upon researcher to investigate either it is better to invest in the company or not before they jump to invest in the company.

5.4.2 Recommendation for researchers

For researchers, the subsequent recommendations are extracted from this study:

- Researcher must be evaluated the results on what the information is provided on tye stock exchange, and should represent is true essence.
- The study should be re-examined by taking the large sample size and time period should also be extended.
- Researcher should evaluate properly the true picture of the stock exchange.

5.4.3 Recommendation for business finance graduate

For business graduate, the subsequent recommendations are extracted from this study:

- Students are properly educated about efficiency of market in developing and under developing countries.
- Students are properly educate there are not always true picture of rise of stock prices.
- There must be the role of market signal which may be wrong or right depending upon the perspective situation, which in true artificially increases the stock price.

5.4.4 Recommendation for corporate managers

For corporate managers, the subsequent recommendations are extracted from this study:

- Managers should investigate properly the project in which they wanted to invest. Must investigate the project on project evaluate techniques such as capital budgeting.
- Never always jump to invest in high return projects because they are also associated with high risk at the same time because mostly risk and return profile are directly correlated with each other.
- Sometimes the managers is forced by the company to invest in the project seems to be attractive but it is not profitable for the company in that situation they should prevail the company overall long term objectives than individual objectives.

Reference

- Akbar, M., Rahman, A., & Mehmood, Z. (2012). The Myth of Downside Risk Based CAPM: Evidence from Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6), 860-869.
- Ang, A., Chen, J., & Xing, Y. (2001). Downside Risk and the Momentum Effect. Working Paper 8643. National Bureau of Economic Research, Massachusetts.
- Aharoni, G., Grundy, B., & Zeng, Q. (2013). Stock returns and the Miller Modigliani valuation formula: Revisiting the Fama French analysis. *Journal of Financial Economics*, 110(2), 347-357.
- Ang, A., Chen, J., & Xing, Y. (2006). Downside Risk. *Review of Financial Studies*, 19, 1191-1239.
- Al-Mwalla, M., & Karasneh, M. (2012). Fama and French three factor model: Evidence from emerging market. *European Journal of Economics, Finance and Administrative Sciences*, 41, 132-140.
- Alroaia, Y., & Ardekani, M. (2012). Representing a combination algorithm (AHP and Kano) in order to priority effective factors on customer needs in e-banking: The case of Bank-e-Saderat of Tehran Province. *African Journal of Business Management*, 26(6), 7727-7735.
- Ameer, B. (2013). A Test of Fama and French Three Factor Model in Pakistan Equity Market. *Global Journal of Management and Business Research*.
- Ameer, D. (2013). A Test of Fama and French Three Factor Model in Pakistan Equity Market. *Global Journal of Management and Business Research*, 13(7).
- Aleati, A., Gottardo, P., & Murgia, M. (2000). The pricing of Italian equity returns. *Economic Notes*, 29(2), 153-177.
- Abbas, Q., Ayub, U., & Saeed, S. K. (2011). CAPM-Exclusive Problems Exclusively Dealt. *Interdisciplinary Journal of Contemporary Research in Business*, 2(12), 947-960.
- Abbas, Q., Ayub, U., & Saeed, S. K. (2011). CAPM-Exclusive Problems Exclusively Dealt. *Interdisciplinary Journal of Contemporary Research in Business*, 2(12), 947-960.
- Artavanis, N. T., & Kadlec, G. B. (2012). Downside risk and long-horizon stock return reversals.
- Bello, Z. Y. (2005). Socially responsible investing and portfolio diversification. *Journal of Financial Research*, 28(1), 41-57.

- Banz, R. W. (1981). "The Relationship between Return and Market Value of Common Stocks." *Journal of Financial Economics*, 9, 3-18.
- Black, F., Jensen, M. C., & Scholes, M. (1972). The capital asset pricing model: Some empirical tests. *Studies in the theory of capital markets*, 81(3), 79-121.
- Barberis, N., & Thaler, R. (2003). A survey of behavioral finance. *Handbook of the Economics of Finance*, 1, 1053-1128.
- Basu, S. (1983). "The Relationship between Earnings Yield, Market Value, and Return for NYSE Common Stocks." *Journal of Financial Economics*, 12, 129-156.
- Black, F. (1993). Beta and return. *Journal of Portfolio Management* 20, 8-18.
- Barber, B. M., & Lyon, J. D. (1997). Firm size, book-to-market ratio, and security returns: A holdout sample of financial firms. *The Journal of Finance*, 52(2), 875-883.
- Bawa, V., & Lindenberg, E. (1977). Capital Market Equilibrium in a Mean-Lower Partial Moment Framework. *Journal of Financial Economics*, 5(2), 189-200.
- Bhatti, M. R., & Mirza, A. B. (2014). A comparative study of CAPM and seven factors risk adjusted return model. *Paradigms*, 8(1), 13-26.
- Broadbent, S. R., & Kendall, D. G. (1953). The random walk of *Trichostrongylus retortaeformis*. *Biometrics*, 9(4), 460-466.
- Bhandari, L. C. (1988). Debt/equity ratio and expected common stock returns: Empirical evidence. *The journal of finance*, 43(2), 507-528.
- Carhart, M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, 52(1), 57-82.
- Chan, L. K., Hamao, Y., & Lakonishok, J. (1991). Fundamentals and stock returns in Japan. *the Journal of Finance*, 46(5), 1739-1764.
- Chan, L. K., Jegadeesh, N., & Lakonishok, J. (1995). Evaluating the performance of value versus glamour stocks The impact of selection bias. *Journal of financial Economics*, 38(3), 269-296.
- Chan, H.W., & Faff, R.W. (2005). Asset pricing and the illiquidity Premium. *FinancialReview*, 40, 429-458.
- Campbell, J. Y., Campbell, J. J., Campbell, J. W., Lo, A. W., Lo, A. W. C., & MacKinlay, A. C. (1997). *The econometrics of financial markets*. princeton University press.

- Chui, A. C., & Wei, K. J. (1998). Book-to-market, firm size, and the turn-of-the-year effect: Evidence from Pacific-Basin emerging markets. *Pacific-Basin finance journal*, 6(3-4), 275-293.
- Chen, C., Hu, X., Shao, Y., & Wang, J. (2015). Fama-French in China: Size and Value Factors in Chinese Stock Returns. University of Hong Kong Working Paper.
- Carmichael, B., & Coën, A. (2008). Asset pricing models with errors-in-variables. *Journal of Empirical Finance*, 15, 778-788.
- Daniel, K., & Titman, S. (1997). Evidence on the characteristic of cross-sectional variation in stock return. *The Journal of Finance*, 52(1), 1-33.
- De Bondt, W. F., & Thaler, R. H. (1995). Financial decision-making in markets and firms: A behavioral perspective. *Handbooks in operations research and management science*, 9, 385-410.
- Damodaran, A. (2007). Valuation approaches and metrics: a survey of the theory and evidence. *Foundations and Trends® in Finance*, 1(8), 693-784.
- De Bondt, W. F., & Thaler, R. H. (1995). Financial decision-making in markets and firms: A behavioral perspective. *Handbooks in operations research and management science*, 9, 385-410.
- Drew, M. E., Naughton, T., & Veeraraghavan, M. (2003). Firm size, book-to-market equity and security returns: Evidence from the Shanghai Stock Exchange. *Australian Journal of Management*, 28(2), 119.
- Drew, M. E., Naughton, T., & Veeraraghavan, M. (2003). Is idiosyncratic volatility priced? Evidence from the Shanghai Stock Exchange.
- Damodaran, A. (2007). Return on capital (ROC), return on invested capital (ROIC) and return on equity (ROE): Measurement and implications. *Return on Invested Capital (ROIC) and Return on Equity (ROE): Measurement and Implications (July 2007)*.
- Bank, E. (2011). <https://ericbank.com/tag/asset-pricing/>
- Estrada, J. (2000). The Cost of Equity in Emerging Markets: A Downside Risk Approach. *Emerging Markets Quarterly*, 4, 19-30.
- Estrada, J. (2002). Systematic Risk in Emerging Markets: the D-CAPM. *Emerging Markets Review*, 3, 365-379.
- Faff, R. (2001). A Multivariate Test of a Dual-Beta CAPM: Australian Evidence. *Financial Review*, 36(4), 157-174.
- French, K. R. (1980). Stock returns and the weekend effect. *Journal of financial economics*, 8(1), 55-69.

- Fama, E. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383-417.
- French, K. R. (1980). Stock returns and the weekend effect. *Journal of financial economics*, 8(1), 55-69.
- Fama, E., & Schwert, G.W. (1977). Asset returns and inflation. *Journal of Financial Economics*, 5, 115–146.
- Fama, E. F., & French, K. R. (1992). “The Cross-Section of Expected Stock Returns.” *Journal of Finance*, 47, 427-466.
- Fama, E. F., & French, K. R. (1993), “Common Risk Factors in the Returns of Stocks and Bonds.” *Journal of Financial Economics*, 33, 3-56.
- Fama, E. F., & French, K. R. (1995), “Size and Book to Market Factors in Earnings and Returns.” *Journal of Finance*, 50, 131-155.
- Fama, E., & MacBeth, J. (1973). Risk, Return and Equilibrium: Empirical Tests. *The Journal of Political Economy*, 81, 607-636.
- Fama, E. F., & French, K. R. (1996). Multifactor explanations of asset pricing anomalies. *The Journal of Finance*, 51, 55-83
- Fama, E. F., & French, K. R. (1998), “Value versus Growth: The International Evidence.” *Journal of Finance*, 53, 1975-1999.
- Fama, E. F., & French, K. R. (2008), “Dissecting anomalies.” *Journal of Finance*, 63, August 2008.
- Fabozzi, F. J., Gupta, F., & Markowitz, H. M. (2002). The legacy of modern portfolio theory. *Journal of Investing*, 11(3), 7-22.
- Fama, E. F., & French, K. R. (2012). Size, value, and momentum in international stock returns. *Journal of financial economics*, 105(3), 457-472.
- Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics*, 116(1), 1-22.
- Fama, E. F., & French, K. R. (2016). Dissecting anomalies with a five-factor model. *Review of Financial Studies*, 29(1), 69-103.
- Ghaeli, M. (2017). Price-to-earnings ratio: A state-of-art review. *Accounting*, 3(2), 131-136.

- Gan, C., Hu, B., Liu, Y., & Li, Z. (2013). An empirical cross-section analysis of stock returns on the Chinese A-share stock market.
- Groenewold Fraser, N. P. (1997). Share prices and macroeconomic factors. *Journal of Business Finance & Accounting*, 24(9-10), 1367-1383.
- Gómez, J. P., & Zapatero, F. (2003). Asset pricing implications of benchmarking: a two-factor CAPM. *The European Journal of Finance*, 9(4), 343-357.
- Gul, F. (1991). A Theory of Disappointment Aversion. *Econometrica*, 59, 3, 667-686.
- Grootveld, H., & Hallerbach, W. (1999). Variance vs downside risk: Is there really that much difference? *European Journal of Operational Research*, 114, 304–319.
- Griffin, J. M. (2002). Are the Fama and French factors global or country specific?. *Review of Financial Studies*, 15(3), 783-803.
- Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: evidence from the field. *Journal of financial economics*, 60(2-3), 187-243.
- Ho, Y. W., Strange, R., & Piesse, J. (2000). CAPM anomalies and the pricing of equity: evidence from the Hong Kong market. *Applied Economics*, 32(12), 1629-1636.
- Hogan, W. & Warren, J. (1974). Towards the Development of an Equilibrium Capital-Market Model Based on Semivariance. *Journal of Financial & Quantitative Analysis*, 9(1), 1-11.
- Harlow W., & Rao, K. (1989). Asset Pricing in a Generalized Mean-Lower Partial Moment Framework: Theory & Evidence. *Journal of Financial & Quantitative Analysis*, 24, 285-311.
- Harvey, C. R. (2000). The drivers of expected returns in international markets. *Available at SSRN 795385*.
- Harlow, W. (1991). Asset Allocation in a Downside-Risk Framework. *The Financial Analyst Journal*, 47(5), 28-40.
- Iqbal, J., & Brooks, R. (2007). A test of CAPM on the Karachi Stock Exchange. *International Journal of Business*, 12(4).
- Iqbal, J., & Brooks. R. (2007). Alternative Beta Risk Estimators and Asset Pricing Tests in Emerging Markets: the Case of Pakistan. *Journal of Multinational Financial Management*, 17, 75-93.
- Jensen, M. C. (1978). Some anomalous evidence regarding market efficiency. *Journal of financial economics*, 6(2/3), 95-101.

- Javid, A. Y., & Ahmad, E. (2008). Testing multifactor capital asset pricing model in case of Pakistani market. *Research Journal of Finance and Economics*, (25), 114-138.
- Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. *The Journal of finance*, 48(1), 65-91.
- Jagannathan, R., & McGratten, E. R. (1995). The CAPM Debate. Quarterly Review of the Federal Reserve Bank of Minneapolis. 19, 2-17.
- Khan, M. I., Gul, M., Khan, N. M., & Nawaz, B. (2012). Assessing and testing the Capital Asset Pricing Model (CAPM): a study involving KSE-Pakistan. *Global Journal of Management and Business Research*, 12(10).
- Kraus, A., Litzenberger, R. (1976). Skewness Preference and the Valuation of Risky Assets. *Journal of Finance*, 31(4), 1085-1094.
- Kent, D., & Moskowitz, T. J. (2014). Momentum crashes. NBER Working Paper Series, 20439.
- Khan, M. I. (2012). Non-standardized form of CAPM and stock returns. *International Journal of Business and Social Science*, 3(2).
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47, 263-291.
- Kendall, M. (1953). The analysis of economic time series, part I: prices. *Journal of the Royal Statistical Society*. 116(1), 11–34.
- Lam, K. (2005). “Is the Fama-French Three Factor Model better than the CAPM.” Simon Fraser University.
- Lam K.S.F., Li, K., & So, S.M. (2009). On the validity of the augmented Fama and French’s (1993) model: Evidence from the Hong Kong stock market. Working Paper Series.
- L’Her, J-F., Masmoudi, T., & Suret, J-M. (2003). Evidence to support the four-factor pricing model from the Canadian stock market. *Journal of international financial markets, institutions & money*, 313-328.
- Levy, H., & Lerman, Z. (1985). Testing P/E Ratios Filters with Stochastic Dominance. *The Journal of Portfolio Management*, 11(2), 31-40.
- Lam, K. S. (2002). The relationship between size, book-to-market equity ratio, earnings–price ratio, and return for the Hong Kong stock market. *Global Finance Journal*, 13, 163-179.

- L'Her, J.F., Masmoudi, T., & Suret, J.M. (2004). Evidence to support the four-factor pricing model from the Canadian Stock Market. *Journal of International Financial Markets, Institutions and Money*, 14, 313-328.
- Lin, J., Wang, M., & Cai, L. (2012). Are the Fama–French factors good proxies for latent risk factors? Evidence from the data of SHSE in China. *Economics Letters*, 116(2), 265-268.
- Moskowitz, T., & Grinblatt, M.J. (1999). Do industries explain momentum? *The Journal of Finance*, 54(4), 1249-1290.
- Markowitz, H.M. (1959). “Portfolio Selection: Efficient Diversification of Investment,” New York: John Wiley & Sons.
- Malin, M., & Veeraraghavan, M. (2004). “On the Robustness of the Fama and French Multifactor Model: Evidence from France, Germany, and the United Kingdom.” *International Journal of Business and Economics*, 3 (2), 155-176.
- Mangram, M. E. (2013). A simplified perspective of the Markowitz portfolio theory. *Global journal of business research*, 7(1), 59-70.
- Masood, S., Saghir, G., & Muhammad, W. (2012). The capital asset pricing model: Empirical evidence from Pakistan.
- Meng, Z., & Ju, R. (2013, December). Explanatory power of three-factor model on A-share market of Shanghai Exchange in China. In 2013 International Conference on Advances in Social Science, Humanities, and Management (ASSHM-13). Atlantis Press.
- Nicholson, S. F. (1960). Price-earnings ratios. *Financial Analysts Journal*, 16(4), 43-45.
- Naceur, S.B., & Chaibi, H. (2007). The best asset pricing model for estimating cost of equity: Evidence from the stock exchange of Tunisia. Working Paper Series.
- Nguyen, D., & Puri, T. (2009). Systematic liquidity, characteristic liquidity and asset pricing. *Applied Financial Economics*, 19, 853-868.
- Oke, B. O. (2013). Capital Asset Pricing Model (CAPM): Evidence from Nigeria. *Research Journal of Finance and Accounting*, 4(9), 17-26.
- Oslen, I. T. (1998). A framework for analyzing sustainability. *Health Policy and Planning*, 13, 3-287.
- Olmo, J. (2007). An asset pricing model for mean-variance-downside-risk averse investors.

Post, T., & Levy, H. (2005). Does risk-seeking drive stock prices? ... Investor preferences and beliefs. *Review of Financial Studies*, 18, 925-953.

Pedersen, C.S. and S. Hwang, (2003), Does downside beta matter in asset pricing? Working Paper, Cass Business School, London, UK.

Petkova, R. (2006). Do the Fama–French factors proxy for innovations in predictive variables?. *The Journal of Finance*, 61(2), 581-612.

Rashid, A., & Hamid, F. (2015). "Downside risk analysis of returns on the Karachi Stock Exchange". *Managerial Finance*, 41(9), 940 – 957

Roll, R. (1977). A critique of the asset pricing theory's tests Part I: On past and potential testability of the theory. *Journal of financial economics*, 4(2), 129-176.

Rehman, H. U., Gul, S., Razzaq, N., & Saif, N. Rehman, S. u., & Javed, DA (2013). Impact of capital asset pricing model (CAPM) on Pakistan (The case of KSE 100 Index). *Research Journal of Finance and Accounting*, 4(7), 168-177.

Rabin, M., & Thaler, R. H. (2001). Anomalies: risk aversion. *Journal of Economic perspectives*, 15(1), 219-232.

Rosenberg, B., Reid, K., & Lanstein, R. (1985). Persuasive evidence of market inefficiency. *The Journal of Portfolio Management*, 11(3), 9-16.

Rubinstein, M. E. (1973). A comparative statics analysis of risk premiums. *The Journal of Business*, 46(4), 605-615.

Stulz, R. M. (1995). International portfolio choice and asset pricing: An integrative survey. *Handbooks in Operations Research and Management Science*, 9, 201-223.

Sharpe, W. F., & Cooper, G. M. (1972). Risk-return classes of New York stock exchange common stocks, 1931–1967. *Financial Analysts Journal*, 28(2), 46-54.

Sahut, J. M., & Pasquini-Descomps, H. (2015). ESG impact on market performance of firms: International evidence. *Management international/International Management/Gestión Internacional*, 19(2), 40-63.

Schaefer, C. E. (1999). Curative factors in play therapy. *The Journal for the Professional Counselor*, 14(1), 7-16.

Schuermann, T., & Stiroh, K. J. (2006). *Visible and hidden risk factors for banks* (No. 252). Staff Report.

- Shefrin, H. (2001). Do investors expect higher returns from safer stocks than from riskier stocks?. *The Journal of Psychology and Financial Markets*, 2(4), 176-181.
- Shleifer, A. (2000). *Inefficient markets: An introduction to behavioural finance*. OUP Oxford.
- Sharpe, W. F. (1964). "Capital Asset Prices: A Theory of Market Equilibrium under Uncertainty." *Journal of Finance*, 19, 425-442.
- Tahir, M., Abbas, Q., Sargana, S. M., Ayub, U., & Saeed, S. K. (2013). An investigation of beta and downside beta based CAPM-case study of Karachi Stock Exchange. *American Journal of Scientific Research*, 85-118.
- Tripathi, V., & Seth, R. (2014). Stock market performance and macroeconomic factors: The study of Indian equity market. *Global Business Review*, 15(2), 291-316.
- Tahir, M., Abbas, Q., Sargana, S. M., Ayub, U., & Saeed, S. K. (2013). An investigation of beta and downside beta based CAPM-case study of Karachi Stock Exchange. *American Journal of Scientific Research*, 85-118.
- Trevino, R., & Robertson, F. (2002). P/E ratios and stock market returns. *Journal of Financial Planning*, 15(2), 76.
- Unlu, U. (2013). Evidence to support multifactor asset pricing models: The case of the Istanbul stock exchange. *Asian Journal of Finance & Accounting*, 5(1), 197.
- Veneeya, V. (2006). Analysis of modern portfolio theory. *Coursework4you.[online] Available at < [http://www. articlesbase. com/finance-articles/analysis-of-modernportfolio-theory-40421. html](http://www.articlesbase.com/finance-articles/analysis-of-modernportfolio-theory-40421.html)>[Accessed 25 July 2016]*.
- Viale, A. M., Kolari, J. W., & Fraser, D. R. (2009). Common risk factors in bank stocks. *Journal of Banking & Finance*, 33(3), 464-472.
- Wang, F., & Xu, Y. (2004). What determines Chinese stock returns?. *Financial Analysts Journal*, 60(6), 65-77.
- Weigand, R. A., & Irons, R. (2007). The market P/E ratio, earnings trends, and stock return forecasts. *Journal of Portfolio Management*, 33(4), 87.
- Xu, J. K., & Zhang, S. (2014). The Fama-French three factors in Chinese stock market. *China accounting and finance review*, 16(2), 210-227.